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Working both sides of the street:
Computational and psycholinguistic
investigations on idiomatic variability

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Abstract

Over the years, the original conception of idioms as semantically empty and formally frozen units (Bobrow and Bell, 1973; Swinney and Cutler, 1979) has been replaced by a more complex view, whereby some idioms display an analyzable semantic structure (Nunberg, 1978) that allows for greater formal plasticity (Nunberg et al., 1994; Gibbs and Nayak, 1989). Corpus data have anyway shown that all types of idioms allow for a certain degree of manipulation if an appropriate context is provided (Duffley, 2013; Vietri, 2014). On the other hand, psycholinguistic data have revealed that the processing of idiom variants is not necessarily harder than the processing of idiom canonical forms or that it can be similar to the processing of literal language (McGlone et al., 1994; Geeraert et al., 2017a). Despite this possible variability, in two computational studies we show that focusing on lexical fixedness is still an effective method for automatically telling apart non-compositional idiomatic expressions and compositional non-idiomatic expressions by means of distributional-semantic indices of compositionality that compute the cosine similarity between the vector of a given phrase to be classified and the vectors of lexical variants of the same phrase that are generated distributionally or from the Italian section of MultiWordNet (Pianta et al., 2002). Idioms all in all result to be less similar to the vectors of their lexical variants with respect to compositional expressions, confirming that they tend to be employed in a more formally conservative way in language use. In two eye-tracking studies we then compare the reading times of idioms and literals in the active form, in a passive form with preverbal subject and in a passive form with postverbal subject, which preserves the verb-noun order of the canonical active form. The first experiment reveals that passives are longer to read than actives with no significant effect of idiomaticity in passive forms. A second experiment with more ecological dialogic stimuli reveals that preserving the surface verb-noun order of the active form facilitates the processing of passive idioms, suggesting that one of the core issues with idiom passivization could be the violation of canonical verb-noun order rather than verb voice per se.

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List of abbreviations

Abbreviation	Meaning
<i>ant</i>	Model with iMWN variants including both iMWN synonyms and antonyms in Chapter 2
BNC	British National Corpus
BofE	Bank of English
CANCODE	Cambridge and Nottingham Corpus of Discourse in English
COCA	Corpus of Contemporary American English
<i>cos</i>	Model with iMWN variants filtered by cosine in Chapter 2
DSM	Distributional Semantic Model
F	F-measure
FEIs	Fixed Expressions and Idioms
FN	False positive
FP	False negative
<i>freq</i>	Model with iMWN variants filtered by frequency in Chapter 2
IAP	Interpolated Average Precision
iMWN	Italian MultiWordNet
Max	Maximum
MI	Mutual Information
MICASE	Michigan Corpus of Academic Spoken English
Min	Minimum
MWE	Multiword Expression
NLP	Natural Language Processing
NN	Nearest Neighbor
<i>no</i>	Model not encoding zero variants in Chapter 2
OHPC	Oxford Hector Pilot Corpus
<i>orth</i>	Model encoding zero variants as orthogonal vectors in Chapter 2
PMI	Pointwise Mutual Information
PPMI	Positive Pointwise Mutual Information
SVD	Singular Value Decomposition
<i>syn</i>	Model with iMWN variants including only iMWN synonyms in Chapter 2
TN	True negative
TP	True positive
<i>var</i>	Variant

Overview

The present dissertation consists in a collection of computational and eye-tracking experiments that set out to investigate the relationship between idiomaticity and semantic non-compositionality on the one hand and lexical and syntactic variability on the other hand.

Idioms have been at the center of a considerable body of theoretical, computational and psycholinguistic research (Katz and Postal, 1963; Weinreich, 1969; Makkai, 1972; Chomsky, 1980; Fillmore et al., 1988; Cacciari and Glucksberg, 1991; Nunberg et al., 1994; Sag et al., 2002; Fazly et al., 2009; Cacciari, 2014; Titone and Libben, 2014; Geeraert, 2016) by virtue of their semantic and structural idiosyncratic properties, which make their account challenging for mainstream grammar models (Chomsky, 1957, 1965, 1980). First off, they are semantically non-compositional multiword expressions, whose meaning goes beyond a composition of the meanings of their constituent words. Second, they display more restrictions in the lexical and syntactic variability they allow with respect to literal and compositional expressions. Over the years, the original conception of idioms as semantically empty and formally fixed words-with-spaces (Katz and Postal, 1963; Weinreich, 1969; Bobrow and Bell, 1973; Swinney and Cutler, 1979) has been replaced by a more complex view, whereby some idioms possess an analyzable internal semantic structure (Nunberg, 1978) that permits greater lexical and syntactic elasticity (Nunberg et al., 1994; Gibbs and Nayak, 1989; Gibbs et al.,

1989a). Corpus data have anyway shown that all types of idioms allow for a certain degree of formal manipulation if an appropriate context is provided (Glucksberg, 2001; Vo, 2011; Duffley, 2013; Vietri, 2014). On the other hand, psycholinguistic data have revealed that the processing of idiom formal variants is not necessarily harder than the processing of idiom canonical forms or can be similar to the processing of literal language (McGlone et al., 1994; Geeraert et al., 2017a).

The aim of the experiments described in this thesis is hence to shed further light on the issue of idiom variability by adopting two complementary perspectives and methodologies. On the one hand, focusing on real data from large-scale corpora can give a sense of how actually wide-spread a given phenomenon like idiom variability is in current language use. This can be beneficial to understand if focusing on formal plasticity as a discriminating factor is actually a sound strategy to implement effective computational indices of compositionality that automatically tease apart idiomatic and non-idiomatic phrases in text corpora. On the other hand, shifting the focus on the mind of the speaker via psycholinguistic experiments allows researchers to understand how these idiom variants are actually processed from a cognitive standpoint, regardless of their frequency of occurrence in language use. More specifically, these experiments make it possible to test if idiom variants are actually harder to process with respect to unvaried idioms or literal expressions occurring in the same syntactic structure and which factors (e.g. context, familiarity, semantic transparency, etc.) come into play and interact in affecting processing.

The first variability axis we take into account is the lexical one. Offline psycholinguistic data suggest that lexically varied idioms are less acceptable than idioms in the canonical form, but that nonetheless these lexical variants become more acceptable when idioms are highly familiar (Geeraert et al., 2017b) or semantically analyzable (Gibbs et al., 1989a). Online data show that lexical variants can

be processed similarly to literal language or not differently than idiom canonical forms in the presence of an appropriate context (McGlone et al., 1994; Geeraert et al., 2017a). Although these psycholinguistic studies reveal that lexically varied idioms are not necessarily harder to process with respect to idiom canonical forms and that manifold variables interact in affecting this processing, we decided to complement this cognitive evidence by assuming a computational and corpus-based perspective to understand if lexical flexibility can anyway be used as an effective clue for automatically discriminating compositional vs non-compositional expressions. If such an approach worked out well, this would suggest that, despite some lexical variation being possible, all in all idioms still tend to be used in a lexically conservative way in language with respect to compositional and literal phrases. We thus devise distributional-semantic indices of compositionality that compute the similarity between the vector of a target literal or idiomatic phrase and the vectors of lexical variants of this phrase that are generated by replacing the phrase components with semantically related words. In our predictions, the vectors of idiomatic expressions should turn out to be less similar to the vectors of their lexical variants with respect to the similarity between the vectors of the literal phrases and the vectors of their lexical variants. The algorithms is tested both on a set of Italian idiomatic and non-idiomatic verb-noun phrases and a set of Italian idiomatic and non-idiomatic adjective-noun phrases.

The second axis of variability we investigate is the syntactic one, focusing more specifically on passivization. While computational and corpus-based studies show that idioms tend all in all to be passivized less often than literals (Bannard, 2007; Wulff, 2008), we carry out two eye-tracking experiments to observe if passivized idioms are actually harder to process than active idioms and if passivization is more disruptive for the processing of idiomatic vs literal phrases. Moreover, since Italian syntax allows for a passive structure with postverbal subject, a solution that preserves the verb-noun surface order of canonical active forms, we also aim

at analyzing whether this type of passive form enjoys some kind of processing advantage over passives with preverbal subject. This facilitation would demonstrate that one of the core issues in processing passivized idioms is actually the violation of their canonical verb-noun order rather than verb voice per se. This would have important repercussions on a broader scale, considering that most of the idiom literature has been written on English, which requires a fixed subject-verb order. As for broader-scope theories of sentence processing, the facilitation shown by postverbal-subject passive would be in line with two-tier and good-enough models of sentence processing (Townsend and Bever, 2001; Ferreira et al., 2002), which predict a combination of gut-level pseudo-parse heuristics and full-fledged algorithmic parsing to guide sentence processing at the same time.

The thesis is organized as follows. In Chapter 1, we start off with a general definition of idiomaticity (Section 1.1) and a description of its main features, namely semantic idiosyncrasy (Section 1.2) and, more importantly for the present work, formal rigidity (Section 1.3). We then review previous psycholinguistic models of idiom processing and idiom variant processing (Section 1.4) and previous computational and corpus-based research on automatic idiom identification (Section 1.5.1) and idiomatic variability (Section 1.5.2). In Chapter 2, we describe distributional-semantic experiments on lexical flexibility as a clue to compositionality and idiomaticity, while in Chapter 3 we report two eye-tracking studies on the processing of passivized idioms. We finally provide some general Conclusions on the results of our experiments.

The experiments reported in Chapter 2 were published in Senaldi et al. (2016b), Senaldi et al. (2016a) and Senaldi et al. (2017).

Chapter 1

Idiomaticity in theoretical, psycholinguistic and computational research: a state of the art

1.1 Definition and properties of idiomaticity

The wide body of existing theoretical, psycholinguistic and computational literature on *idiomatic expressions* (or *idioms*) makes it challenging to provide a unitary definition of what idiomaticity actually is and which properties make an expression idiomatic (Katz and Postal, 1963; Weinreich, 1969; Makkai, 1972; Chomsky, 1980; Fillmore et al., 1988; Cacciari and Glucksberg, 1991; Nunberg et al., 1994; Sag et al., 2002; Fazly et al., 2009; Cacciari, 2014; Titone and Libben, 2014; Geeraert, 2016). As Nunberg et al. (1994) point out in an influential contribution, idiomaticity must be conceived of as a multidimensional phenomenon characterized by a variety of features that are often orthogonal with respect to one another. To start off with a working definition, we can describe idioms as a rather heterogeneous

class of *semantically non-compositional multiword expressions* (MWEs) that exhibit a considerable degree of lexicogrammatical rigidity with respect to literal compositional phrases, as well as figurativity and affective valence. Prototypical examples of English idioms that are often brought up in the literature are *kick the bucket* ‘to pass away’, *spill the beans* ‘to disclose secret information’ and *red herring* ‘something that misleads from relevant information’, while examples of Italian idioms are *tagliare la corda* ‘to slip away’ (lit. ‘to cut the rope’), *gettare la spugna* ‘to throw in the towel’ (lit. ‘to throw the sponge away’) and *testa calda* ‘hothead’.

First off, when we speak of semantic non-compositionality, as we will see in Section 1.2, we point to the fact that we cannot grasp the meaning of an idiomatic expression in a bottom-up fashion by combining the meanings of its constituent elements in light of the function of the syntactic structure they partake in (Frege, 1892; Cacciari and Glucksberg, 1991; Nunberg et al., 1994). For instance, while the meaning of *eat a sandwich* can be easily accessed by composing the meaning of *eat* with the meaning of *sandwich* and with the meaning and function of the transitive structure they both occur in, the idiomatic meaning of *kick the bucket* has nothing to do with the meaning of *kick* and the meaning of *bucket* and cannot be sensibly mapped onto the transitive structure that includes both constituents. This state of affairs is further complicated by the fact that some idioms display a marked syntactic structure (e.g. *by and large*, *trip the light fantastic*) or contain words that never occur in isolation (e.g. *put the kibosh on something*, *the whole kit and caboodle*). Despite this recaltrance to bottom-up compositionality, a growing body of evidence suggests that idioms do actually possess some degree of after-the-fact semantic analyzability and motivation, whereby speakers are able, once they become familiar with the meaning of an idiom, to spot some connection between its figurative meaning and the structural and semantic properties of its literal string (Nunberg, 1978; Cacciari and Glucksberg, 1991). Idioms also differ

in literal plausibility. Whereas *ambiguous* idioms can have both a literal and a figurative reading depending on the context (e.g. *break the ice*, *buy the farm*), *non-ambiguous* idioms do not make sense if taken literally, as *come up roses* or *shoot the breeze*.

Second, as we said above, idioms belong to the class of multiword expressions, namely conventional word sequences that act as single units at some level of linguistic analysis (Sag et al., 2002; Masini, 2012; Siyanova-Chanturia and Martinez, 2014). The increasing availability of corpora in the last decades has led linguists to realize that an integral part of our linguistic production is actually made up of prefabricated word sequences rather than assembled word-by-word and on the fly (Sinclair, 1991; Jackendoff, 1995; Biber et al., 1999; Erman and Warren, 2000; Van Lancker-Sidtis and Rallon, 2004). These data shed doubt on the traditional generative view of words as the basic combinatorial units in sentence production, which are supposed to be selected from a lexicon and inserted in the syntactic structures autonomously generated by syntax rules (Chomsky, 1957; Katz and Postal, 1963; Chomsky, 1980). To account for this trade-off between formulaicity and novelty in linguistic production, Sinclair (1991) sets an *idiom principle* against an *open choice principle*, claiming that speakers preferably go for fixed and pre-constructed phrases rather than *ex-novo* combinatorial expressions when generating sentences. Other instances of MWEs include, among the rest:

- *collocations* (e.g. *torrential rain*, *strong tea*), that are semantically compositional or semi-compositional but involve some more or less mutual lexical restriction between their components; for instance, variants like *torrential snow* or *powerful tea* would sound off or foreignisms and are never or hardly ever encountered. Such non-attested variants are called *anticollocations* (Pearce, 2001). To be precise, a considerable subset of existing collocations should be regarded as semi-compositional rather than purely compositional, since one

of the components can assume a specialized meaning just inside the expression. For instance, *stiff* and *heavy* take on special meanings in *stiff drink* and *heavy smoker* respectively;

- *irreversible binomials* (e.g. *salt and pepper*, *black and white*) that are semantically compositional but never occur in reversed order (e.g. **pepper and salt*, **white and black*; Siyanova-Chanturia et al. 2011b);
- *light verb constructions*, as *give a groan* or *make a decision*, where the noun contributes the more to the semantics of the whole expression and the verb acts as a more or less semantically dummy element, that, if anything, contributes aspectual or actional features to the semantics of the phrase (Wittenberg and Piñango, 2011); notably, most light verb constructions can be replaced with a simplex verb that is morphologically related to the noun, like *groan* or *decide* for the two cases just cited;
- *proverbs* (e.g. *the early bird catches the worm*, *a barking dog never bites*), *clichés* (e.g. *better late than never*, *we all make mistakes*) and *conversational routines* (e.g. *have a nice day*, *how are you doing?*).

The study of lexicalized word combinations has been carried out from a variety of standpoints and theoretical strands. The overarching label *multiword expressions* we adopt to refer to this whole class comes from computational linguistic research on the subject matter (Sag et al., 2002; Calzolari et al., 2002; Ramisch, 2015; Constant et al., 2017), which has stressed the formal and semantic idiosyncratic properties of these expressions that make them hard to deal with for Natural Language Processing algorithms (Section 1.5). Phraseological literature (Cowie, 1998; Masini, 2012; Mel'čuk, 2012) uses the term *phraseme* to refer to non-free multiword phrases that are subject to unpredictable restrictions at the lexical or semantic level. Within such a theoretical approach, phrasemes are hence distributed

along a continuum of lexical and semantic idiosyncrasy. *Lexical phrasemes* like collocations, for instance, are compositional but do not allow free lexical choice, while *semantic-lexical phrasemes* like idioms display both non-compositionality and lexical restriction. By contrast, a frequentist and corpus-based approach to word combinations (Firth, 1957; Sinclair, 1991; Evert, 2008) adopts the umbrella term *empirical collocation* to denote whatever kind of word combination that occurs often, as measured by frequency, and with a co-occurrence probability that is higher than chance, as measured by statistical association measures (Church and Hanks, 1991). In this perspective, the requirement for a word combination to be pigeonholed as a collocation is just of empirical and not of theoretical nature. This means that such word combinations may occur often and have high associational scores, without necessarily being semantically or formally idiosyncratic. To provide an example, among the collocates of the word *bucket*, we can have *kick*, which forms an idiom with *bucket*, but also *water*, which gives rise to the frequent but literal phrase *bucket of water*. In Wray's (2002; 2008) approach, prefabricated and lexicalized word sequences are called *formulaic units*. One of the defining traits of the formulaic approach is that, in light of the conventional and prefabricated nature of formulae, its proponents go so far as to make holistic claims about their psycholinguistic processing. According to Wray (2002), a formulaic sequence is therefore defined as:

a sequence, continuous or discontinuous, of words or other elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar (Wray, 2002, p. 9).

As will become clear in Section 1.4 and in Chapter 2, psycholinguistic literature on idiom processing *de facto* demonstrates that idioms and other formulaic sequences are far from being processed as unitary wholes and that their internal semantic

and syntactic structure is activated in processing (Siyanova-Chanturia, 2015).

Of central importance in the present dissertation is the fact that idioms, being originally conceived of as semantically empty words-with-spaces, have traditionally been described as having a greater lexical and morphosyntactic rigidity in comparison to compositional phrases (Katz and Postal, 1963; Weinreich, 1969; Fraser, 1970; Chomsky, 1980; Nunberg et al., 1994). Accordingly, if we take a compositional combination like *read a book* and we passivize it as in *The book has been read*, insert an adjective like *read an interesting book* or replace a constituent with a semantically related word as in *read a novel*, the semantics of the original expression will not be altered to a considerable extent. By contrast, applying the same operations on an idiom like *kick the bucket* (e.g. *The bucket has been kicked*, *kick the sad bucket* and *kick the can*) mostly results in an ill-formed string or in the impossibility to interpret the expression idiomatically. For some idioms though, various operations appear to be more tolerable (cf. *The beans have been spilled* and *spill the diplomatic beans*, but **spill the peas*). A great deal of theoretical (Section 1.3), psycholinguistic (Section 1.4) and corpus-based studies (Section 1.5.2) address the issue of idiomatic variability. Starting from lexical-specification models (Katz and Postal, 1963; Weinreich, 1969) and models predicting a patterned subset behavior (Fraser, 1970; Bianchi, 1993; Folli and Harley, 2007), other scholars postulate a connection between an idiom’s semantic analyzability and its degree of formal versatility (Gibbs and Nayak, 1989; Nunberg et al., 1994). While corpus data partially contradict such patterned-behavior models and decomposability-based theories, showing that formal variation is possible for almost all kinds of idioms (Duffley, 2013; Torre, 2014; Vietri, 2014), especially if an apt context is provided (Glucksberg, 2001), psycholinguistic data suggest that processing idiom variants is akin to processing literal language (McGlone et al., 1994) and it is not necessarily harder than processing the canonical forms of idioms given an appropriate context (Geeraert et al., 2017a).

Despite being a prototypical case of figurative expressions, idioms must not be mixed up with other instances of figurativity like metaphors and proverbs. Generally speaking, figurativeness has to do with pointing at a contextual interpretation for a given expression that goes beyond its mere literal meaning (Frege, 1892; Gibbs et al., 1997). According to the model proposed by Lakoff and Johnson (1980), metaphors (e.g. *the locomotive snorted and belched, my job is a jail*) are figurative expressions that reflect a rather transparent mapping between an abstract concept in a *target domain* (e.g. the tediousness and psychological constraints of a job) and a concrete example taken from a *source domain* (e.g. the physical constraints of a jail), while idioms, which still most of the times diachronically derive from metaphors and have undergone a crystallization process over time, mostly lack such an overt transparent mapping. Moreover, while idioms tend to have a more or less definite meaning, metaphors can often assume very different ones according to their context of occurrence. Cacciari and Papagno (2012) provide the example of *John is an elephant*, which, depending on where and when it occurs, may indicate that John is clumsy, that he is extremely big or that he is a blunderer. Another difference between the two classes of expressions has to do with the way they are processed. On the one hand, idioms seem to bring into play processes similar to lexical access (Cacciari and Papagno, 2012). On the other hand, metaphors seem to activate a categorization process. For instance, according to Glucksberg and Keysar's (1993) model, a sentence like *John is a lion* is interpreted by mapping *John* onto the category of aggressive beings, whose prototypical exemplar is said to be a lion. Also Makkai (1972) advocates for a neat distinction between idioms and metaphors, putting forth the example of lexemes like *downfall*, which are used metaphorically although they are semantically compositional and their components (*down* and *fall*) are used in the sense they have in isolation. On top of that, metaphors represent a productive phenomenon as well. Studies on metaphor production strategies indeed show a large ability of language

users to generalize and create new metaphors on the fly from existing ones, allowing researchers to hypothesize recurrent semantic mechanisms underlying a large number of productive metaphors (McGlone, 1996; Lakoff and Johnson, 1980). Idioms, as we discuss in the present thesis, allow for more constrained creativity and variation. On the other hand, proverbs differ from idioms in that they appear as full sentences, temporarily undefined, characterized by specific features like alliterations, particular phonemes or rhymes and which often exhibit a binary pragmatic theme-comment structure. Proverbs are usually inserted in discourse as general comments to shared communicative contexts, and consist in statements that are generally true both figuratively and literally (Cacciari and Papagno, 2012).

As a last noteworthy feature, idioms are also more emotionally charged with respect to corresponding literal expressions, in that they often imply some kind of affective stance of the speakers towards the reality they point at (Nunberg et al., 1994). For instance, saying that someone *has kicked the bucket* does not simply mean that they died, but it also conveys the concept in a rather indirect and euphemistic manner, that could differ from its literal equivalent in terms of *valence* (i.e. the degree of positivity/negativity of the conveyed concept) and *arousal* (i.e. how stimulating for our sensory modalities a given concept is; Warriner et al. 2013). This feature is leveraged in some computational studies on idiom identification and sentiment analysis (Peng et al., 2014; Williams et al., 2015; Passaro et al., 2019).

All the features of idiomatic expressions we have gone through so far make their account troublesome for mainstream generative grammar models that postulate a division of labor between the grammar and the lexicon (Chomsky, 1957, 1965; Weinreich, 1969; Chomsky, 1980) and have often led these scholars to regard idioms as irregular and peripheral phenomena, listed as unitary and semantically empty lexical entries in a separate section of our lexicon (Katz and Postal, 1963; Weinreich, 1969). By contrast, idioms play a less marginal role in constructionist

approaches (Langacker, 1987; Fillmore et al., 1988; Goldberg, 1995, 2006, 2019; Bybee, 2010; Hoffmann and Trousdale, 2013), which represent the grammar and the lexicon as an interrelated network of *constructions* called *Constructicon*. Constructions are conventionalized pairings of form and function and are disposed in the Constructicon according to their degree of complexity and schematicity (i.e. the opposite of lexical specification). Constructions, in effect, span from simple morphemes (e.g. *-ing*, *pre-*, *anti-*) to single words (e.g. *avocado*, *anaconda*), complex words (e.g. *daredevil*, *shoo-in*), lexically filled idioms (e.g. *kick the bucket*, *go great guns*), partially lexically filled idioms (e.g. *jog X's memory*, *stick to X's guns*) and more abstract structural patterns as the covariational conditional (*the X-er the Y-er*, e.g. *the cheaper the better*), the ditransitive construction and the passive construction. Including in the lexicon also more complex phrasal patterns than just simplex words, that also display different degrees of lexical specification, this approaches stand in clear opposition to the distinction that mainstream generative grammar (Chomsky, 1957, 1965, 1980) operates between lexicon and syntax. Such complex and abstract syntactic templates are said to partake of the Constructicon because they possess an arbitrarily associated meaning or function on their own, which has to be learnt by speakers to be properly comprehended and produced. Inserting idiomatic expressions in this constructionist lexicon as well, these theories overcome the boundaries drawn by generativism between core phenomena, accounted for by canonical syntactic operations, and more peripheral ones, like idiomaticity and non-compositionality, which are not explicable in light of the basic rules of syntactic composition.

Evidence converging from different methodologies (Cacciari and Glucksberg, 1991; Gibbs and Nayak, 1989; Wulff, 2008) has brought out that not all idioms are semantically empty and formally frozen long words, but they rather form a very heterogeneous class and are disposed along a continuum of semantic analyzability and motivation (Nunberg, 1978) and formal plasticity (Fraser, 1970). Wulff (2008)

(see below) proposes to add a horizontal idiomaticity axis to the vertical axis of schematicity in the Constructicon, so as to account for the different degree of idiomaticity displayed by each idiom on the basis of its syntactic transformability, compositionality and frequency.

1.2 Idioms and semantic idiosyncrasy

Speakers possess the ability to convey complex meanings by combining simpler elements as words and phrases into syntactic structures. The principle of *semantic compositionality* elaborated by Frege (1892) affirms that the meaning of a complex expression (p) is a function (f) of the meanings of its subparts (u) and (v):

$$p = f(u, v)$$

Partee (1995) elaborates on this principle by taking into account also the role of the syntactic relationship (R) that holds between the constituent elements of the expression:

$$p = f(u, v, R)$$

This version of the compositionality formula is nonetheless still unsatisfactory, since, as claimed by Lakoff (1977), speakers bring also their knowledge of language and their world knowledge when they compose the meaning of a complex expression, which hence goes beyond a mere combination of the meanings of its component elements. A K variable indicating this kind of knowledge must then be incorporated into the formula:

$$p = f(u, v, R, K)$$

Crucially for our work, not every linguistic expression deriving from a combination of simpler elements displays the same degree of compositionality. A property entailed by compositionality is *salva-veritate*-intersubstitutivity (Frege, 1892), whereby replacing part of a compositional statement with another element having the same denotation does not alter the truth value of the whole expression. For instance, literal expressions like *watch a movie* or *read a novel* are fully compositional, since their meaning can be grasped via a bottom-up combination of the meaning of *watch* and *movie* on the one hand and of *read* and *novel* on the other hand with the meaning and function of the transitive construction they appear in, where the object is affected by the action denoted by the verb. On top of that, their component words can be replaced with semantically related words without bringing about a considerable meaning shift, like in *watch a film* or *read a book*. Collocations like *torrential rain* or *strong tea* are an example of semantically compositional expressions that nevertheless allow very restricted lexical replacement. While *heavy rain* frequently occurs as a viable variant of *torrential rain*, the adjective *torrential* mostly occurs inside of this expression. Likewise, modifying *strong tea* into *powerful tea* would result in an odd and not native-like combination. Idiomatic expressions, which are the class of expressions under our scrutiny, are the prototypical case of *semantically non-compositional* expressions in that their meaning cannot be grasped by simply adding up the meaning of the words they are composed of. For instance, although many idioms diachronically originate from metaphors that have undergone a crystallization process (Cruse, 1986), speakers at a synchronic stage cannot access the figurative meanings of *kick the bucket* and *shoot the breeze* by composing the meanings of *kick* and *bucket* on the one hand and *shoot* and *breeze* on the other in a bottom-up fashion and will rather have to learn their meanings by heart in order to properly use such phrases in language. Moreover, if idiom components are substituted with semantically related words, most of the time the possibility of a figurative reading will be lost (e.g. *kick the*

can, shoot the wind). Complex expressions and multiword units appear thus to be spread on a continuum of semantic compositionality (Fazly and Stevenson, 2008; Mitchell and Lapata, 2010; Masini, 2012; Siyanova-Chanturia and Martinez, 2014).

Compositionality also goes hand in hand with *systematicity* (Fodor and Lepore, 2002), whereby if a natural language speaker is able to understand a complex expression e built up via a syntactic operation F on the elements e_1, \dots, e_n and a second expression e' built up by applying F to e'_1, \dots, e'_n , they will also be able to make sense of another expression e'' built up through F from $e_1, \dots, e_n, e'_1, \dots, e'_n$ (Szab, 2017). Therefore, if speakers can understand *spill the beans* as taken literally and *drop the peas*, they will also understand *spill the peas* and *drop the beans*, but the same reasoning would not apply if one were to consider *spill the beans* as an idiomatic phrase. In short, while replacing the constituent of a compositional phrase with a semantically related word does not alter the meaning of the phrase to a considerable extent, substituting an idiom component mostly does (Cacciari and Glucksberg, 1991; Sag et al., 2002; Fazly and Stevenson, 2008).

Despite the lack of bottom-up semantic compositionality exhibited by idioms, scholars have nonetheless highlighted that the relationship between the literal meaning of a potentially idiomatic string and its figurative non-compositional meaning is not completely opaque for all idioms. Nunberg and colleagues (Nunberg, 1978; Nunberg et al., 1994) and Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a) speak of semantic *decomposability* or *analyzability*, which consists in the possibility to independently map parts of the literal string of an idiom onto parts of its idiomatic meaning. In the classification proposed by Nunberg (1978), *normally decomposable* idioms are expressions like *pop the question*, where each idiom component directly contribute its literal meaning to the figurative meaning of the whole string. In this case, *question* stands for a specific

question, i.e. a marriage proposal, while the verb *pop* stands for the act of suddenly asking the question. In the case for *abnormally decomposable* idioms like *carry a torch*, each component bears a figurative and metaphorical relationship to part of the idiomatic reference. *Torch*, in this idiom, is a conventional metaphor representing warm feelings of love, while *carry* refers to the experience of these feelings. In *spill the beans*, *spill* metaphorically stands for ‘to disclose’ and *beans* for the secret information being revealed. In *nondecomposable* idioms, like *kick the bucket*, the figurative meaning is distributed over the phrase as a whole and it is not possible to trace any analogical mapping between subparts of the string and formants of the idiomatic reference. Nunberg et al. (1994) label decomposable idioms as *idiomatically combining expressions* and nondecomposable idioms as *idiomatic phrases* and maintain that the former are way more formally flexible than the latter because, by virtue of their greater compositionality, they behave more similarly to literal language (cf. Section 1.3). Quite importantly, Nunberg et al. (1994) single out three main semantic features of idioms, namely:

- *conventionality*, i.e. the property whereby the meaning of an idiom cannot be predicted by resorting to our knowledge of the rules that license the usage of its component words in isolation; although Nunberg et al. (1994) employ a different terminology, we can roughly assume that their definition of idiom conventionality falls under the scope of what we regard as semantic non-compositionality;
- *transparency*, namely the possibility to detect some broad-sense and not necessarily isomorphic relation between the literal and the figurative meaning of an idiom; the authors cite the example of *saw logs*, for which it is clear why it means ‘to snore loudly’ although this meaning cannot be partly distributed onto *saw* and partly onto *logs* in a sensible way (Geeraerts, 1995). This idiom is therefore transparent but not isomorphically decomposable. The

opposition between transparency and decomposability is tackled by Van der Linden (1992) in terms of a distinction between “isomorphism” and “motivation”;

- *compositionality*, which according to the authors indicates the possibility to map parts of the literal expression onto parts of the idiomatic meaning once a speaker has known the expression. In the present dissertation, we stick to the conception of semantic compositionality as related to a bottom-up process and rather use the term ‘decomposability’ to refer to *post hoc* analyzability. Crucially, the possibility to isomorphically reconstruct the internal semantics of an idiom does not entail that we can use the idiomatic constituents in isolation with their idiomatic meaning being preserved. *Spill* means ‘to divulge’ only when it co-occurs with *beans* and *beans* means ‘secret information’ only when it is used with *spill*. Nunberg et al. (1994) define the relation between the verb and the NP in an idiomatic combination as a sort of extreme case of mutual selectional restriction, such that both components take on a figurative meaning only when they co-occur with each other.

In a series of psycholinguistic experiments, Gibbs and Nayak (1989) and Gibbs et al. (1989a) observe that speakers can reliably discriminate among the three idiom types and that syntactic and lexical variation is preferred in decomposable idioms, since their subjects judge syntactically or lexically altered decomposable idioms to be more similar to the paraphrase of the figurative meaning of the corresponding unaltered idioms with respect to nondecomposable idioms. Following studies have nonetheless failed at replicating Gibbs and Nayak (1989) and Gibbs et al.’s (1989a) results and at proving the reliability of the classification outlined by Nunberg and colleagues (Nunberg, 1978; Nunberg et al., 1994). Titone and Connine (1994b) have participants carry out two separate classification tasks following the same rules of Gibbs and Nayak (1989) and Gibbs et al. (1989a): subjects are

first asked to classify idioms as either decomposable or nondecomposable and then to divide decomposable idioms into abnormally and normally decomposable ones. At odds with results by Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a), Titone and Connine (1994b) find only 40% of all idioms to be reliably classified into the three categories with a 75% agreement rate. Also Tabossi et al. (2008) replicate the same classification task, using a binomial test to assess how significant the proportion of agreement is between raters and find out that agreement on decomposable vs nondecomposable idiom classification, as well as agreement on normally vs abnormally decomposable idiom classification, is not significantly different from chance. The same authors also carry out a replication study of Gibbs and Nayak (1989) on the relation between flexibility and decomposability and observe that abnormally decomposable idioms obtain lower ratings of semantic similarity to their paraphrases than both normally decomposable and nondecomposable idioms, but normally decomposable and nondecomposable idioms do not turn out to be significantly different, therefore failing to confirm that decomposable idioms are perceived as significantly more flexible than nondecomposable ones.

Cacciari and Glucksberg (1991) propose a more articulate functional typology of idioms on the basis of their semantic analyzability, of their lexical and syntactic flexibility and their discourse productivity (cf. also Section 1.3):

- non-analyzable idioms (Type N) like *by and large* or *spick and span* are totally opaque idioms whose semantic and syntactic analysis are nonfunctional and that should be treated as special lexical entries as if they were non-analyzable long words;
- analyzable-opaque idioms (Type AO) like *kick the bucket* display no discernible relation between the idiom's components and parts of the figurative meaning, but still the semantics of their constituents constrains the kind of

contexts in which these idioms can occur; for *kick the bucket*, for instance, the punctual nature of the verb *kick* prevents the idiom from occurring with *for X time* adverbials unlike the corresponding simplex verb *to die* (e.g. *he lay dying for a week* vs **he lay kicking the bucket for a week*);

- the category of analyzable-transparent idioms (Type AT) encompasses both normally (e.g. *pop the question*) and abnormally decomposable (e.g. *pull strings*) idioms overcoming Nunberg's (1978) dichotomy, since the authors see no principled reason why the literal vs metaphorical contribution of the idiom subparts to the idiomatic reference should differentially affect their processing in discourse;
- quasi-metaphorical idioms (Type M) are idioms like *carry coals to Newcastle* or *give up the ship* where the literal meaning of the expression is a prototypical exemplar of their figurative meaning; since the economy of the Newcastle area was historically based on the sale of coal, carrying coals to Newcastle represents the prototypical instance of a pointless action. Likewise, giving up one's ship is an example of surrendering. Also metonymic idioms like *bury the hatchet* partake of this category, since it initially referred to part of the peacemaking ritual and it now refers to peacemaking in general. Cacciari and Glucksberg (1991) label type M idioms as quasi-metaphorical since these idioms are said to serve the same function as metaphor vehicles like *jail* in the sentence *My job is a jail*. According to Glucksberg and Keysar's (1993) metaphor interpretation model, these figures of speech bring a categorization process into play, whereby metaphor topics (e.g. one's job) are mapped onto abstract categories (e.g. suffocating conditions) whose typical exemplar is represented by the vehicle (e.g. a jail).

In his book-length cognitive-linguistic analysis of idiomatic creativity, Langlotz (2006) lays out a complex semantic taxonomy of idioms that is subsequently taken

over by Vo (2011) and Torre (2014). According to Langlotz (2006), there are four main conceptual patterns that shape the internal semantics of idioms, namely *conceptual metaphor*, *conceptual metonymy*, *conceptual blending* and *emblems*. Conceptual metaphor theory has held sway in linguistic studies on figurative language since Lakoff and Johnson's (1980) seminal work and maintains that human beings tend to conceive of relatively abstract conceptualizations in a so-called *target domain* in terms of objects and situations taken from a concrete *source domain*. At the root of conceptual metaphors lie *image-schemas*, i.e. rudimentary abstract kinesthetic patterns like CONTACT, CONTAINER, PATH and UP-DOWN that take shape out of regularities in our daily activities and serve as conceptual building blocks for more complex concepts (Lakoff, 1987). A conceptual metaphor can determine several interrelated linguistic metaphors. A conceptual metaphor that is often cited as an example is THE DEVELOPMENT OF A LOVE RELATIONSHIP IS A JOURNEY, which underlies figurative love-related expressions like *We are at a crossroads* or *We may have to go our separate ways*. Conceptual blending refers to a meaning construction process where elements coming from two mental spaces are combined, while in conceptual metonymy elements in a conceptual domain are referred to through some other elements that are in a contiguity relation with them, as in the CONTAINER FOR CONTENT metonymy that is evoked in sentences like *I drank a whole bottle*. Finally, emblems constitute culture-specific stereotypical depictions of abstract concepts, as in the case of *man is a wolf* which, rather than instantiating the metaphor PEOPLE ARE ANIMALS, refers to the fact that in many cultures wolves are seen as incarnations of evil. To classify idioms on the basis of their semantics, Langlotz (2006) distinguishes between three dimensions, namely the literal *compositionality* of the idiomatic string in the Fregean sense (Frege, 1892), *motivation* which more or less corresponds to what Nunberg et al. (1994) calls transparency, and *isomorphism* between parts of the literal string and parts of the idiomatic reference in line with Nunberg and colleagues (Nun-

berg, 1978; Nunberg et al., 1994). Compositionality in Langlotz’s (2006) typology just refers to whether a compositional literal scene can be created from the idiom string. For instance, *kick the bucket* is compositional from a literal point of view, while *trip the light fantastic* is not. Motivation basically consists in the possibility of a top-down interpretative process whereby a speaker can reactivate and motivate the semantics of an idiom starting from the literal meaning of the string by means of one of the four conceptual patterns outlined above. Isomorphism, in this perspective, is regarded as a subtype of motivation. For instance, *spill the beans* is both motivated and isomorphic in that we can motivate its figurative meaning by virtue of the image-schema CONTAINER via the conceptual metaphors THE MIND IS A CONTAINER and IDEAS ARE ENTITIES. In addition, we can isomorphically map *beans* to IDEAS/ENTITIES and *spill* to the act of extracting IDEAS/ENTITIES from the mind’s CONTAINER. By contrast, *spin one’s wheels* is motivated on the basis of the conceptual metaphors PURPOSEFUL ACTIVITY IS A CAR JOURNEY and SUCCESS IS MOVING FORWARD but without any possibility to separately map *spin* and *wheels* to parts of the idiomatic reference ‘to fail to achieve anything satisfactory’. Langlotz (2006) speaks in terms of *global* motivation when the idiom can be motivated as a whole and *constituent* motivation when single idiom components have lexicalized figurative senses also when they occur by themselves (see below).

Langlotz (2006) first of all tells apart core idiom types with a fully compositional literal meaning and marginal types with a fully non-compositional literal meaning. Idioms belonging to core types are divided into:

- *idioms with literal compositionality, global motivation and figurative-literal isomorphism* – an example is represented by *grasp the nettle*, whose meaning ‘to tackle a predicament boldly’ can be motivated on the basis of the metaphors DEALING WITH AN ISSUE IS GRASPING IT and PROB-

LEMS ARE DANGEROUS OBJECTS. We can establish an isomorphic mapping between *grasp* and ‘to tackle boldly’ and between *nettle* and ‘predicament’, but both components assume these meanings just when they occur together;

- *idioms with literal compositionality, global motivation, constituent motivation, and figurative-literal isomorphism* – an example is *jump on the bandwagon*, since, in addition to the features exhibited by idioms in the previous category, its subpart *bandwagon* has a lexicalized figurative meaning (‘fashionable idea, activity or group’) also when it occurs on its own;
- *idioms with literal compositionality and global motivation* – the idiom *grit one’s teeth* in an instance of this group, since its meaning is motivated as a whole, without any possibility of a one-to-one isomorphic mapping, by means of a conceptual metonymy: one gritting their teeth can be imagined as part of a scene where the same subject is enduring an unpleasant situation;
- *idioms with literal compositionality, but neither motivation nor isomorphism*, like *kick the bucket*, which has a plausible literal meaning but it is semantically opaque.

Marginal idiom types include:

- *idioms with a compositional, but unrealistic literal meaning* – in the case of *rack one’s brains*, the idiom potentially has a literal meaning, but it is not plausible and derives from a conceptual blending between a torture scenario and the representation of the brain as the body part that is responsible for cognitive activity and reasoning;
- *partially compositional idioms* like *look daggers at somebody* have one of their elements (in this case *look*) contributing its literal meaning and the other

one (*daggers*) maintaining a metaphorical relation to the idiomatic meaning, so that the idiom as a whole means something like ‘to aggressively look at somebody’. The syntactically ill-formedness of many of these idioms is due to the conceptual blending that in this case for instance takes place between the verb *to look* and the action of *throwing daggers* at someone;

- *literally non-compositional, constructionally idiosyncratic idioms* do not make literal sense and are both semantically and syntactically ill-formed, like *trip the light fantastic* or *come up roses*;
- *literally non compositional idioms with cranberry morphs* like *put the kibosh on something* or *the whole kit and caboodle* contain cranberry words that never occur by themselves. There we are at a loss to understand what they mean in isolation;
- *idioms with absent literal compositionality due to the presence of highly specialized word-meanings and garden-path constituents* – in these final idiom type, the phrases contain a word with a highly specialized meaning that is unknown to most speakers like *hide your light under a bushel*, where *bushel* indicates a unit of volume that corresponds to eight gallons.

In Table 1.1 we compare the semantic taxonomies proposed by Nunberg et al. (1994), Cacciari and Glucksberg (1991) and Langlotz (2006) according to the dimension of semantic analyzability or isomorphism, which is the criterion that the three approaches share. Non-isomorphic motivation (or transparency) is discussed in all the three works, but it is used as a classification criterion only by Langlotz (2006). The three taxonomies are disposed in the table along a complexity continuum, with Nunberg et al. (1994) proposing a dichotomic classification, Cacciari and Glucksberg (1991) distinguishing between four different classes and Langlotz (2006) singling out nine different idiom types. Some idiom types are listed in both

Nunberg et al. (1994)	Cacciari and Glucksberg (1991)	Langlotz (2006)
Idiomatic phrases	Non-analyzable Analyzable opaque Quasi-metaphorical	Compositional, not motivated Motivated, not isomorphic Compositional but unrealistic Non-compositional, idiosyncratic syntax Non-compositional, cranberry morphs Specialized component meanings
Idiomatically combining expressions	Analyzable transparent Quasi-metaphorical	Globally motivated, isomorphic Constituent motivation, isomorphic Compositional but unrealistic Partially compositional Non-compositional, idiosyncratic syntax Non-compositional, cranberry morphs Specialized component meanings

Table 1.1: A comparison of the semantic taxonomies of idioms proposed by Nunberg et al. (1994), Cacciari and Glucksberg (1991) and Langlotz (2006) on the basis of their semantic analyzability (or decomposability or isomorphism). Idiom types in the first row are semantically non-analyzable, idiom types in the second row are analyzable.

groups since their defining properties are orthogonal with respect to analyzability. For instance, the meaning of a quasi-metaphorical idiom (Cacciari and Glucksberg, 1991) like *carry coals to Newcastle* cannot be sensibly distributed among *carry*, *coals* and *Newcastle*, so it will count as an idiomatic phrase in Nunberg et al.’s (1994) dichotomy, while if we interpret the quasi-metaphorical *bury the hatchet* as something like ‘to reconcile a disagreement’, we will be able to map ‘to reconcile’ onto *bury* and ‘disagreement’ onto *hatchet*. The same applies to many of the categories singled out by Langlotz (2006). A non-compositional idiom with idiosyncratic syntax like *by and large* is not analyzable, while an idiom belonging to the same group as *come up roses* can be isomorphically analyzed as *come up* being used in its literal sense and *roses* meaning something like ‘successfully’. To provide another example, a non-compositional idiom with a cranberry morph like *spick and span* is not analyzable, while in *put the kibosh on something*, which means ‘to put a stop to something’, *put* can stand for ‘put’ and *the kibosh* can

stand for ‘a stop’.

Hence, as clearly emerges from the semantic taxonomies of idioms advanced by different scholars in the literature, although all idioms are semantically non-compositional, they still represent a very heterogeneous category that displays varying levels of semantic analyzability and transparency and are rather distributed along a continuum according to their formal and semantic properties (Wulff, 2008; Cacciari, 2014; Geeraert, 2016). Noteworthily, as Keysar and Bly (1995) have shown, our perception of idiom semantic idiosyncrasy is determined not only by idiom-related but also by speaker-related factors. The authors take a set of archaic idioms like *the goose hangs high* and teach its correct meaning (‘things look good’) to a subset of participants and its opposite meaning (‘things look bad’) to another subset of participants. When both participant groups are then asked to rate the semantic transparency of either the original or opposite meaning from the perspective of an uninformed external speaker, they rate the meaning they have been taught as significantly more transparent. These results suggest that speakers’ perception of idioms’ transparency is affected by familiarity and that the more familiar with a given idiom speakers are, the more they will be able to motivate its meaning and come up with a subjective explanation of why that idiom means what it does.

A confirmation of the influence of speakers’ knowledge of idioms on their perceived transparency comes from Geeraert’s (2016) experiment on semantic transparency, where speakers are asked to rate how transparent a set of idioms is (i.e. how obvious their figurative meaning is starting from the literal one) by employing a continuous Visual Analogue Scale. She finds that a series of idiom-related and speaker-related variables are at play in affecting transparency judgments. On the one hand there are idiom length, contextual similarity between an idiom and its definition and frequency, which all lead speakers to rate idioms as more transpar-

ent and to rate them faster. As pertains to speaker-related variables, Geeraert (2016) finds out that knowledge of the idioms under investigation leads speakers to rate them as more transparent, therefore corroborating the results by Keysar and Bly (1995). She goes on to observe that, as stated by Langlotz (2006), idioms bring into play non-conventional metaphors and metonymies that expand on the literal meaning of idiom component words to convey more complex and abstract concepts. As we have seen in the various idiom classification systems discussed above, the conceptual metaphors and metonymies underlying certain idioms are synchronically more active in the minds of the speakers than those motivating other more opaque idioms. Anyway, if such opaque idioms are well known to speakers, they are nonetheless able to come up with a personal interpretation of their semantic origin, as shown by Gibbs (1994) in the case of *kick the bucket*. This idiom originally referred to the practice of slaughtering hogs, which used to be tied to a wooden framework called *buquet* during their execution. This *buquet*, a French loanword then corrupted in English as *bucket*, was the last thing hogs kicked in their death struggles. At a synchronic stage, when speakers are asked to motivate the semantics of this idiom, they will mostly imagine a hanging scenario, where the bucket is kicked away to kill the condemned person (Gibbs, 1994). This shows that, although it is oftentimes impossible to reverse-engineer the figuration underlying many idioms given that they involve old-fashioned metaphors that have crystallized over time, humans are still able to figure out a viable figurative interpretation for opaque idioms or even idioms they do not know. Cacciari (1993), in this regard, shows that speakers apply a variety of strategies to make sense of unfamiliar idioms, as comparing them to other better-known idioms, interpreting one word literally and leveraging the other word to expand the semantics of the phrase, or trying to visualize a mental picture of what a given string could mean if taken figuratively. Evidence on the effect of semantic decomposability on idiom processing has in any case been mixed, as we will see in Section 1.4, with

some studies (Caillies and Butcher, 2007) reporting a facilitating effect of decomposability in priming and others (Titone and Connine, 1999; Libben and Titone, 2008; Titone and Libben, 2014) finding no facilitating effects or only late effects of decomposability in processing.

1.3 Formal flexibility in idioms

In theoretical, psycholinguistic and computational studies on idiomaticity, when going through the prototypical peculiarities that make an idiomatic expression, scholars cannot help but point out a greater recalcitrance to lexical, morphological and syntactic variability with respect to semantically compositional expressions (Weinreich, 1969; Katz, 1973; Fraser, 1970; Cacciari and Glucksberg, 1991; Nunberg et al., 1994; Sag et al., 2002; Langlotz, 2006; Fazly et al., 2009; Cacciari, 2014; Geeraert, 2016; Stone, 2016). Such a statement is usually corroborated by ostension of minimal-context examples where it shows clearly how phenomena like adjectival modification (1), passivization (2) and relativization (3) can hinder a figurative interpretation or anyway generate an ill-formed sentence when applied to some idioms, but not to all of them:

- (1) a. *John and Paul shot the funny breeze.
- b. *Our grandmother kicked the sad bucket last night.
- c. Our investors spilled the financial beans eventually.

- (2) a. *The breeze was shot by John and Paul.
- b. *The bucket was kicked by our grandmother last night.
- c. The beans were eventually spilled by our investors.

- (3) a. *The breeze that John and Paul shot was funny.
- b. *The bucket that our grandmother kicked last night was due to illness.
- c. The beans that our investors eventually spilled were already known to everybody.

As will appear in Section 1.5.2, corpus investigations have made the point that the acceptability of such idiomatic variants is not a black or white case, but is rather subject to multiple factors, including the semantic and syntactic structure of the idiom under scrutiny, the sentential context, the textual genre and other pragmatic and sociolinguistic variables. In the case of adjectival insertion, for instance, Ernst (1981) advocates for a distinction between *internal* and *external* adjectival modification, where the latter refers to instances like *kick the proverbial bucket* where the idiom is modified as a whole and the adjective thus serves as a metalinguistic comment on the entire phrase. This second type of adjectival modification seems to be more acceptable across all the idiom classes, while the former does not always give rise to acceptable transformations (Cacciari and Glucksberg, 1991).

Generally speaking, the traditional view of idioms as formally frozen words-with-spaces dates back to early generative accounts of idiomaticity, which construe idioms as semantically empty items that are listed as macro-words in a separate and peripheral section of the lexicon (Katz and Postal, 1963; Weinreich, 1969; Chomsky, 1980).

Katz and Postal (1963) first and foremost distinguish between *lexical idioms* and *phrasal idioms*. On the one hand, lexical idioms are non-compositional morpheme sequences dominated by low-level syntactic categories as nouns, adjectives

and verbs, like *tele+phone*, whose meaning is directly assigned without any need for projection rules. In their framework, a set of syntactic rules and a lexicon represent the main components of language. Lexical morphemes are simply listed in the lexicon, while syntactic rules assemble the phrase marker of a sentence, whose terminal nodes are grammatically marked positions to be filled by lexical items. In the case of a correspondence between the grammatical marking of a lexical item and the marking of a terminal node in the phrase marker, the lexical item is put in this sentence position. At this point, projection rules go through all the senses listed for that item in the lexicon and assign it the correct one. More specifically, Katz and Postal (1963) posit a distinction between a lexical-item part and a phrase-idiom part of the semantic dictionary. In the latter, the sequence of morphemes making up an idiomatic string are associated with the constituent that dominates the idiomatic stretch in the phrase marker (e.g. the MV constituent in the case of a verbal idiom like *kick the bucket*), which also receives the idiomatic meaning. The entry for *kick the bucket* in the phrase-idiom dictionary will thus look like “kick+the+bucket → MV → reading corresponding to the meaning ‘to die’ ”. Most importantly for our discussion, the authors go on to justify the impossibility of a figurative interpretation for passive sentences like *The bucket was kicked by Mary* by taking over Klima’s (unpublished, 1960-1961) theory that passive sentences have a different phrase marker than active sentences, which contains a Manner Adverbial component, terminally represented by a passive morpheme, rather than having a transformed version of the same underlying phrase marker of actives. In this passive sentence the phrase *the bucket was kicked* is dominated by the MV constituent plus the passive morpheme, therefore not satisfying the conditions required by the lexical entry “kick+the+bucket → MV → reading corresponding to the meaning ‘to die’ ”. This lexical specification model, which is purely stipulative and does not take into account possible systematic relationships between variation types, is further elaborated on by Katz (1973), who posits a bi-

nary feature [+Idiom] to be applied to idiom subparts in the lexicon like [_Vkick], [_{DET}the], [_Nbucket] and [_{NP}the bucket]. Hence, syntactic transformations will not be feasible in those cases where they affect a phrase marker component marked as [+Idiom].

Drawing on Chomsky's (1965) generative model, Weinreich (1969) puts forward an *idiom comparison rule*, which, after a phrase marker is generated from the base component and lexical rules put together a terminal string and insert it in the terminal nodes of the phrase marker, check if this terminal string tallies with any entry of the idiom list in the lexicon. As regards idiom syntactic manipulability, Weinreich (1969) claims that each idiom in the lexicon is specified for the syntactic variations it can or cannot undergo via binary features like [+ Passivization] or [- Gerundization]. It has to be noted anyway that not only is such a lexical specification system uneconomical, but predicting that the phrase structure of an idiom is first autonomously generated according to the rules of the base component and then matched with its lexicon entry falls short of accounting how syntactically ill-formed idioms like *by and large* or *kingdom come* can actually be formed and used in sentences.

In a similar fashion to generative lexical specification accounts, Chomsky (1980) introduces the notion of *idiom rule* and argues that both non-idiomatic and idiomatic terminal strings are generated by base rules and lexical items are then inserted in terminal X^0 positions from the lexicon. While non-idiomatic strings receive their meaning via regular semantic interpretation, if a terminal string matches an idiomatic string listed in the lexicon, the D-structure is reanalyzed by means of an idiom rule. Sentences in (4) are for instance reanalyzed as (5) via the idiom rule, which deletes the syntactico-semantic features of the individual words *kick* and *bucket* in the first case and *take*, *advantage* and *of* in the second case, includes the object NPs and also the P node of the second case into

the V-node and assigns the meanings ‘to die’ and ‘to exploit’ to the resulting configurations:

- (4) a. John [VP [V kicked][NP the bucket]]
b. John [VP [V took][NP advantage][P of][NP Bill]]
- (5) a. John [VP [V kicked the bucket]]
b. John [VP [V took advantage of][NP Bill]]

The original syntactic structures of the sentences are nonetheless retained so as to make syntactic variations possible. To account for transformational deficiencies, a mechanism is postulated which marks the output of each idiom rule with a list of all the transformations that are allowed or not allowed by each idiom.

A pivotal transformative account of idiom syntactic idiosyncrasy is provided by Fraser (1970), one of the first scholars to spot some kind of patterned and more or less systematic behavior in the variational restrictions exhibited by idioms instead of regarding them as a purely idiosyncratic phenomenon to be addressed in a case-by-case fashion. Adopting the same generative perspective, Fraser (1970) conceives of entries in the lexicon as composed of a set of insertion restrictions that specify the syntactic context in which a lexical item can appear (e.g. the entry for the verb *hit* specifies that it must be preceded by a human subject noun phrase and followed by a non-abstract object noun phrase), a complex symbol including syntactic features (e.g. [+ V] and [+ Process] in the case of *hit*) that dominate the phonological representation of the item, and a set of semantic markers providing semantic information. If the insertion restrictions and the syntactic features of the lexical entry match those of the phrase marker generated via base rules, the item is inserted into the phrase marker. Since idioms display formal plasticity, Fraser (1970) claims that their deep structure representation corresponds to the repre-

sentation of their compositional counterparts. A verb-object idiom like *kick the bucket* is thus represented as a verb phrase, in turn comprising a verb plus a noun phrase. In idiom lexical entries, a complex symbol does not directly dominate the phonological representation, but rather it comprises a set of other complex symbols, the first specifying the syntactic function and phonological shape of the verb, the second encoding information on the determiner and the last one expressing the syntactic function and phonological representation of *bucket*. To insert the idiom into the phrase marker, insertion restrictions and syntactic features must be met for the whole phrase. Semantic interpretation is then assigned to the lowest constituent dominating the idiom in the tree. A syntactically irregular idiom like *by and large* is treated by simply listing it in the lexicon as it is and putting it into the phrase marker as dominated by an adverbial constituent, since it partakes of the same class as adverbials like *certainly* or *surely*. Even though no other examples of conjoined adverbials need to be introduced in the base, the author claims that this would not be problematic and that introducing such a string in the base does not bring on any bad consequence for the rest of the system. When dealing with the transformational deficiencies of idioms, Fraser (1970) first of all describes such variations as *operations* being carried out on the phrase marker rather than *transformations*, since the syntactic behavior exhibited by idioms would invalidate the distinction noted by Lakoff (1965) between governed and ungoverned transformations. Governed transformations, like passivization, can be blocked for certain lexical items even when the syntactic context would be compatible with them (e.g. the verb *suit* in *That secretary suits me fine* is to be marked as [- Passive] since the passive version **I am suited fine by that secretary* is not acceptable), while ungoverned ones like particle movement (6) or gerundive nominalization (7) can always be applied with no exception. While this holds for compositional expressions, it is not the case for idioms:

- (6) *The man blew some steam off.

(7) *Your cooking your goose was stupid.

Fraser (1970) therefore prefers to express himself in terms of operations applied to the phrase marker and lays out an implicational Frozenness Hierarchy divided into six levels, from L0, which corresponds to complete fixedness, to L6, which stands for unrestricted variability and it is occupied by non-idiomatic language only. Idioms that belong to a given level allow for operations specified at that level and at all the lower levels. Each idiom is hence marked with a lexical feature specifying the hierarchy level it occurs at:

- L6 - Unrestricted: non-idiomatic language
- L5 - Reconstitution: action nominalization (e.g. *His laying down of the law to his daughter*)
- L4 - Extraction: particle movement (e.g. *look up the information* vs *look the information up*), passivization (e.g. *The law was laid down by her father*), preposing of prepositional phrases (e.g. *On whom can we depend?*)
- L3 - Permutation: indirect object movement, particle movement in verb-particle-noun phrase idioms (e.g. *put some weight on* vs *put on some weight*), yes-no question transformation (e.g. *Has the cat got your tongue?*)
- L2 - Insertion: some cases of indirect object movement (e.g. *John read the class the riot act*)
- L1 - Adjunction: gerundive nominalization (e.g. *John's hitting the ball*)
- L0 - Completely Frozen: e.g. *bleed one white, turn a deaf ear to*

As previously said, Fraser (1970) maintains that no idiom belongs to L6, which would permit, among the rest, topicalization and clefting. Such operations could

not be applied to expressions containing semantically empty and non-referential elements, since the main effect of topicalization is actually to bring to the fore a referential element at the level of discourse. According to the author it would make no sense, for instance, to produce a sentence like **It was the buck that John passed* since *buck* does not have a standalone figurative meaning that could be extracted and highlighted with respect to the rest of the idiomatic string.

Bianchi (1993) proposes a formal-syntactic analysis of a set of 28 Italian verbal idioms and divides them into three groups according to the subset behavior they show for a series of syntactic operations, like left-dislocation, non-quantificational and quantificational movement, bare *wh*-phrases, clefting and *tough*-movement. The first group includes idioms *tagliare la corda* ‘to slip away’ (lit. ‘to cut the

Operation	I	II	III	Arguments
Left dislocation	+	+	+	+
Non-quantificational movement	-	+	+	+
(Restricted) quantificational movement	-	-	+	+
Bare <i>wh</i> -phrase	-	-	-	+
Clefting	-	-	-	+
<i>Tough</i> -movement	-	-	-	+

Table 1.2: Transformational deficiencies of three groups of Italian idioms in Bianchi (1993).

rope’), *ficcare il naso* ‘to stick one’s nose’ and *alzare il gomito* ‘to lift one’s elbow’, the second group includes idioms like *fare gli onori di casa* ‘to do the honors’ (lit. ‘to do the home honors’), *fare giustizia* ‘to do justice’ and *dare una lezione* ‘to make an example’ (lit. ‘to give a lesson’), while the third one comprises idioms like *prestare attenzione* ‘to pay attention’ (lit. ‘to lend attention’), *prendere l’iniziativa* ‘to take the initiative’ and *fare progressi* ‘to make headway’. The behavior of these three groups of idioms is compared to the behavior of true referential arguments, that are assigned an actual thematic role like Agent, Patient or Experiencer. While both idioms and referential arguments tolerate left-dislocation,

Bianchi (1993) illustrates that non-quantificational A' movement and A movement are accepted only by idioms in the second and third group and that quantificational A' movement is only tolerated by idioms in the third group. In quantificational A' movement, the moved element is a quantifier phrase composed of a quantifier Q and a nominal term T defining a range R that Q quantifies over. This kind of movement is subject to the Weak Crossover Effect (Lasnik and Stowell, 1991), whereby a trace bound by an interrogative or a restrictive relative pronoun cannot be coindexed with a pronoun on its left:

- (8) a. *Who_i did his_i neighbors killed *t_i*?
 b. *Every teacher_i that his_i pupils love *t_i* is satisfied.

Quantificational operations like restrictive relativization and *what*-interrogations (9) are thus tolerated in the third group only:

- (9) a. *Che naso ha ficcato nei tuoi affari? (I)
 'What nose did she/he stick into your business?'
 b. *Che lezione ti hanno dato? (II)
 'What lesson did they give you?'
 c. Che iniziativa ha preso? (III)
 'What initiative did she/he take?'

Non-quantificational and A movements like passivization (10) appear to be acceptable just for idioms in the third group:

- (10) a. *La corda è stata tagliata da Gianni. (I)
 'The rope was cut by Gianni (= Gianni slipped away)'.
 b. ?Una analoga lezione gli è stata data da Gianni. (II)
 'A similar lesson was given to him by Gianni'.

- c. L'iniziativa è stata presa dal comitato. (III)
'The initiative was taken by the committee'.

More details on Bianchi's (1993) treatment of passivization in idioms will be provided in Chapter 3 as they will be relevant to our eye-tracking experiments on syntactic flexibility in Italian idioms. Finally, the other movements listed in Table 1.2 like the *tough*-movement cannot be applied to any of the three idiom groups:

- (11) a. *La corda è difficile da tagliare. (I)
'The rope is hard to cut'.
b. *Una bella lezione è difficile da dare a Gianni. (II)
'A good lesson is hard to give to Gianni'.
c. ??L'iniziativa è difficile da prendere in queste circostanze. (III)
'The initiative is hard to take under these circumstances'.

Quite interestingly, Bianchi (1993) notes that what distinguishes idioms in group II and III is the fact that they are more compositional than idioms in group I since their NPs give some independent semantic contribution to the whole phrase and are thus assigned actual theta roles. In her formal syntax-based treatment, some kind of semantic motivation is thus put forward to explain the syntactic behavior of idioms. Moreover, she also underlines how idioms in group I, in addition to being totally non-compositional, display also an invariable determiner and do not allow adjectival insertion (e.g. **tagliare questa corda* vs *dare una bella lezione* vs *prendere questa iniziativa*).

To wrap up, while approaches like the ones proposed by Weinreich (1969), Katz (1973) and Chomsky (1980) are stipulative case-by-case, other contributions start to see idiom syntax as patterned and exhibiting subset behavior, like Fraser (1970) and Bianchi (1993). Quite interestingly, Bianchi (1993) puts forth

a tentative semantic explanation that could differentiate idioms tolerating both non-quantificational and quantificational movement from idioms that only accept left-dislocation, which is that their NPs are more compositional and actually contribute some independent meaning to the whole phrase, while idioms in the first group are entirely non-compositional.

The idea that the syntactic behavior of idioms can be at least partly explained on the basis of their semantics is also suggested by Chafe (1968) and Newmeyer (1974) although one of the most influential accounts in this regard comes from Nunberg and colleagues (Nunberg, 1978; Wasow et al., 1983; Nunberg et al., 1994). As we already discussed, Nunberg et al. (1994) tease apart idiomatically combining expressions like *spill the beans* and *break the ice*, where one can establish some mapping between parts of the literal phrase and formants of the idiomatic meaning, and idiomatic phrases like *kick the bucket* and *hit the hay* that are entirely nondecomposable and where the figurative meaning is distributed over the whole phrase, without any possibility to sensibly distribute it to its single parts. Nunberg et al. (1994) observe that idiomatically combining expressions seem to be more accepting than idiomatic phrases of syntactic operations that put focus or refer to single idiom components, since in the context of these idioms, these words possess a semantics of their own. Examples are adjectival modification (12), anaphoric reference (13), passivization (14) and topicalization (15):

(12) a. spill a couple of beans

b. *shoot a couple of breezes

(13) a. I thought Mary would break the ice, but it was John to break it eventually.

b. *I was about to hit the hay, but then I decided not to hit it and I watched a movie instead.

- (14) a. Advantage was always being taken of him, since he was too generous.
- b. *The hay was hit by all the guests in the inn.
- (15) a. These beans, he might spill whenever he gets distracted.
- b. *The bucket, he might kick if he doesn't watch out.

As for adjectival modification, while an insertion like *spill a couple of beans* does not mean ‘to disclose information twice’ but rather ‘to disclose two pieces of information’ and thus modifies just part of the figurative reference, in the case of nondecomposable idioms (e.g. *kick the proverbial bucket*) it may work as a metalinguistic comment to the expression as a whole (*external modification*; Ernst, 1981; Cacciari and Glucksberg, 1991). Another type of external modification that we can find in both decomposable and nondecomposable idioms is made via pejoratives and derogatory adjectives (Napoli and Hoeksema, 2009) like *damn* or *freaking* (e.g. *spill the damn beans*, *kick the freaking bucket*). Even in this case, the possibility to modify nondecomposable idioms as well is not the proof of a standalone idiomatic meaning of the idiom components, because these adjectives serve the pragmatic purpose of intensifying the meaning of the expression as a whole. As we will see in further detail, this relationship between semantic decomposability and syntactic manipulability has been framed in psycholinguistic terms as the Idiom Decomposition Hypothesis by Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a).

A similar point is made by Cacciari and Glucksberg (1991) and Glucksberg (2001), who argue that both the internal semantics of the idioms and discourse context function as the determinants of idiom flexibility and productivity. First of all, there must be some functional relation between the meaning of an idiom’s

components and the meaning of the whole expression for lexical substitution, syntactic operations and discourse productivity phenomena to take place. Second, these variations must result in some kind of relevant semantic alteration to be justified and deemed as acceptable. Finally, some communicative or discourse purpose must lie behind the usage of a varied form in place of the original idiom. Analyzing variability and productivity phenomena for each class, Cacciari and Glucksberg (1991) observe that:

- Type N idioms like *by and large* are non-analyzable since their interpretation does not stem from a constituent-by-constituent semantic and syntactic analysis. While syntactic alteration would not produce any sensible outcome, the authors still observe that internal modification that plays on the semantics of single components is still possible, like *by and not-so-large*. Despite the lack of decomposability, it is still possible to somehow grasp the contribution given by *large* to the meaning of the idiom as a whole. This kind of internal variation can downplay the original meaning of the phrase and give rise to discourse productivity phenomena, as in the following example by Cacciari and Glucksberg (1991):

(16) A: By and large, people are well off these days.

B: By and not-so-large! Have you seen the figures on homelessness in America?

Since internal modification seems to be possible for such idioms as well, the authors go so far as to say that pure type N idioms may actually not even exist;

- in the case of analyzable-opaque (Type AO) idioms like *kick the bucket*, lexical replacements like *kick the pail* or *boot the bucket* would be probably understood as idiomatic in a proper context (Gibbs et al., 1989a), but speakers would still have a hard time understanding what the communicative

function of such a replacement would be and would probably regard these lexical variants as uninformative and inapt. As far as syntactic flexibility is concerned, while according to Cacciari and Glucksberg (1991) passivization for AO idioms would not be acceptable, since it serves the purpose to topicalize referents that have already been brought up and it would not make sense to topicalize a semantically non-compositional word, the actional features of the verb *kick* are preserved in the idiom and can influence the contexts where it is used. Although one can lie in their bed dying for a week, Cacciari and Glucksberg (1991) notice that it would sound odd to say **He lay kicking the bucket for a week*, since kicking is a discrete action; once again, in specific contexts, wordplays on opaque idioms can be accepted, especially if the expression has already been used in previous discourse:

- (17) A: Did the old man kick the bucket last night?
 B: Nah, he barely nudged it.

In this specific case, the second speaker is playing on the semantics of *kick* and downgrading it to suggest that the person they are talking about is seriously ill and about to die, but he is not actually passing away yet;

- analyzable-transparent idioms (type AT) can license a greater variability due to the possibility to independently map parts of the literal string onto components of the idiomatic meaning, always with the caveat that such lexical and syntactic transformation must serve a communicative purpose of some kind and must be tailored on both the literal and the figurative meaning of the expression at issue. Cacciari and Glucksberg (1991) argue that in the case of an idiom like *break the ice*, a verbal variant as *crack the ice* would mostly be taken as a slip of the tongue, while noun variants as *break the chill* or *break the frost* could sound apt if *chill* and *frost* are chosen to denote a more personal form of embarrassment and coldness than the impersonal

stiffness conveyed by *ice*. Contrariwise, a lexical alternative like *crush the ice* would result a bit off, since an *ice* of the kind described here is more of a thin and fragile social barrier than can crack and break rather than something like a thick ice that can be smashed and crushed. As already suggested by Nunberg et al. (1994), passivization and pluralization/singularization of single components are licensed in appropriate contexts and possibilities for discourse productivity phenomena are even higher given the analyzability of the idioms under investigation:

(18) A: David is really weak; I bet he spilled the beans.

B: Spill? He literally poured them all over the place!

- quasi-metaphorical idioms (Type M) differ from analyzable idioms since their literal meaning conveys a prototypical case of the figurative meaning. Therefore, lexical choice is more restricted in these kind of idioms. Cacciari and Glucksberg (1991) anyway observe that occasional puns are possible, like in the title of the newspaper article *Carrying coals to Shoreham* where the issue of the unused nuclear power plant in Shoreham, Long Island is discussed, with a clear reference to the quasi-metaphorical idiom *carry coals to Newcastle*. As for the rest, other lexical and syntactic flexibility processes can be licensed as in transparent idioms, with the same constraints of semantic and pragmatic felicitousness.

Keeping in mind the theoretical approaches to idiomatic flexibility reviewed so far, the extensive corpus studies we will go over in Section 1.5.2 will provide a less black or white and straightforward picture. Formal modifications will appear to be possible, albeit not very frequent to be sure, even for idioms that have traditionally been labeled as non-transparent and non-analyzable, contradicting also the strictly hierarchical models proposed by Fraser (1970) and Bianchi (1993). Putting together such corpus-based data with psycholinguistic evidence on idiom

variation that we will review in Section 1.4 and that we will present in Chapter 3, we will obtain a picture of idiomatic flexibility as a complex and multifaceted phenomenon, regulated by a variety of determinants, like idioms' transparency, analyzability and literal plausibility, contextual features, cognitive constraints and communicative intentions.

1.4 Psycholinguistic evidence on the processing of idioms and idiom variants

Three theoretic strands have mainly taken shape in the psycholinguistic literature in the attempt to account for the way speakers access idiomatic expressions in their mental lexicon during comprehension (Libben and Titone, 2008; Cacciari, 2014). At the center of the debate lies most of all whether idioms are represented and processed as unanalyzed wholes in a holistic fashion or if speakers are sensitive to their internal semantic and syntactic structure. While *non-compositional* views maintain that idioms are basically represented as long words, without speakers accessing constituent-related information in processing (Bobrow and Bell, 1973; Swinney and Cutler, 1979), *compositional* stances hold that the internal semantic structure of an idiom affects its processing (Abel, 2003; Gibbs and Nayak, 1989; Gibbs et al., 1989a; Nunberg, 1978). In between there are *hybrid* theories (Cacciari and Tabossi, 1988; Titone and Connine, 1999), that regard word-by-word compositional analysis and holistic retrieval of idiomatic meaning as two successive phases.

In two experiments, Bobrow and Bell (1973) resort to a set paradigm (Marshall, 1965) where subjects are asked which meaning of a potentially idiomatic sentence (e.g. *John let the cat out of the bag*) comes to mind first after being exposed to a set of idiomatic or literal sentences. While being exposed to a set of

literal sentences decreases the bias of seeing the idiomatic meaning of the target idiom first, by the same token exposure to an idiomatic set increases the probability of interpreting the target idiom as figurative first. Bobrow and Bell (1973) explain these results by postulating two different processing modes of idioms and literal phrases. More specifically, according to this non-compositional lexical look-up model, when a speaker encounters a potentially idiomatic sentence, a literal interpretation mechanism will be brought into play first. If such literal processing fails and makes no sense, subjects will initiate an idiomatic processing mode, retrieving the idiomatic meaning from a separate *idiom list* in the mental lexicon (*Idiom List Hypothesis*). By contrast, if subjects have already activated the idiom mode, the figurative meaning of the potentially idiomatic sentence will be accessed first. The predictions of this stage model are contradicted by Ortony et al.'s (1978) study, where subjects take part in a self-paced reading experiment with post-test comprehension questions on dialogues ending with an idiom used literally or figuratively or a literal paraphrase of the idiom. In contrast to what is predicted by stage models like the Idiom List Hypothesis, subjects do not appear to comprehend idioms more slowly than literal phrases. Swinney and Cutler (1979) take issue with Bobrow and Bell's (1973) study, pointing out that it claims to put forth an online idiom processing model without actually resorting to an online paradigm to verify it. In a visual phrase classification task where subjects have to decide whether a given word combination is a valid English phrase or not, Swinney and Cutler (1979) register significantly shorter latencies for idioms with respect to literal controls. In light of these data, the authors propose a *Lexical Representation Hypothesis*, according to which idioms are stored as lengthy words in the mental lexicon. When speakers come across an idiomatic sentence, upon occurrence of the first word of the idiomatic string a word-by-word compositional analysis of the phrase and a direct retrieval of its idiomatic meaning are initiated at once. Since lexical access is faster than computation, the idiomatic meaning is

activated before the literal meaning. A more extreme version of the Lexical Representation Hypothesis that rules out the activation of the literal meaning is provided by the *Direct Access Hypothesis* from Gibbs (1980, 1986). In a paraphrase judgment task, participants are asked to decide if the paraphrase of a sentence containing an idiom used literally or figuratively is true. Since participants turn out to be significantly faster in responding to idiomatic targets after an idiomatic context than to literal targets after a literal context and, quite importantly, appear also faster at responding to idiomatic targets after a literal context, Gibbs (1980, 1986) concludes that if the idiomatic string is immediately recognized as an idiom, speakers can also bypass the compositional literal analysis and directly go for the non-compositional interpretation. A confirmation of the Direct Access view also comes from a recall task carried out by Botelho Da Silva and Cutler (1993), who find idioms to be recalled more often than control strings with no significant difference between semantically or syntactically ill-formed and well-formed idioms. Anyway, in the following years, Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a,b) end up adopting a more compositional view on the mental representation of idioms. Drawing on Nunberg's (1978) notion of decomposability, they propose an *Idiom Decomposition Hypothesis*, whereby normally decomposable idioms should be more syntactically productive than nondecomposable or abnormally decomposable idioms and freely undergo syntactic operations like passivization and adjective insertion that normally apply to compositional language because their component words independently contribute to the meanings of the entire idioms. In Gibbs and Nayak (1989), subjects are presented with syntactically altered idioms and asked to rate how similar the meaning of these phrases is to the paraphrase of the same unaltered idioms. Variations being tested are adverb insertion, adjective insertion, passivization, action nominalization and inflection in the present participle. Furthermore, Gibbs et al. (1989a) test the same prediction by carrying out the same similarity-based investigation on lexi-

cally altered idioms. All in all, data from both experiments seem to support the Idiom Decomposition Hypothesis, so that idioms whose subparts independently contribute to the overall meaning of the phrases are perceived by subjects as more syntactically and lexically productive than nondecomposable idioms.

Anyway, as we have already noted in Section 1.2, following studies have criticized the reliability of the notion of decomposability by demonstrating that subjects hardly agree with one another when classifying idioms into the three groups and seem to perform not differently than chance (Titone and Connine, 1994b; Tabossi et al., 2008). Moreover, as underlined in Section 1.5.2, instances of formal variation for nondecomposable idioms as well have been frequently spotted in corpora (Duffley, 2013; Vietri, 2014). A pivotal study in idiom comprehension that contradicts the claims of non-compositional models and the idiom advantage view held by both the Lexical Representation Hypothesis (Swinney and Cutler, 1979) and the Direct Access Hypothesis (Gibbs, 1980, 1986) is carried out by Cacciari and Tabossi (1988). In a series of cross-modal priming experiments, they have participants listening to sentences containing an idiom and then performing lexical decision on either a word related to the idiomatic meaning of the phrase (idiom target), a word related to the literal meaning of the phrase (literal target) or a control word. For instance, after the sentence *The girl decided to tell her boyfriend to go to the devil, once and for all*, the idiom target is *away*, the literal target is *horns* and the control is *trout*. Cacciari and Tabossi (1988) find out that when idioms can be predicted before the subjects listen until their final word, idiom targets are responded to faster than literal words and control words; when idioms cannot be predicted before their final word, literal targets are responded to faster than idiomatic targets and controls; finally, when idioms are still unpredictable before their final word but lexical decision is asked with a delay of 300 ms after the end of the idiom, both idiomatic targets and literal targets are responded to faster than controls. These results lead Cacciari and Tabossi (1988) to propose

the *Configuration Hypothesis*, which predicts that idioms are processed word-by-word in a compositional way until enough linguistic material has been encountered to recognize the string under scrutiny as an idiom. After this *recognition point* (or *idiom key*) has been reached, subjects access the idiomatic meaning. In this view, idioms are hence not processed as semantically empty long words, but the semantics of their component words is still activated to some degree, in spite of the non-compositionality of the whole phrase. The time point at which idiomatic meaning is accessed is therefore dependent on predictability. When subjects for example read a phrase like *be in seventh...*, they are likely to guess that the expression at issue is *be in seventh heaven* and will therefore access its non-compositional meaning before than when they read less predictable idioms like *break the ice*. In this case, the idiom can be guessed less easily when a subject is just exposed to the first two words of the string (*break the...*). Therefore, the figurative meaning of *break the ice* is expected to be activated later than the figurative meaning of *be in seventh heaven*. As Fanari et al. (2010) demonstrate, anyway, the position of the idiom key is not fixed for each expression, but can be influenced by other contingent variables like preceding sentence context.

Another hybrid idiom processing model is the *Superlemma Hypothesis* (Sprenger et al., 2006), initially elaborated to account for idiom production (Kuiper et al., 2007). In this model, the syntactic properties of an idiom are encoded in a superlemma representation at the lexical-syntactic level, which is in turn linked to the representations of its constituent lemmas. The superlemma is then connected to the lexical concept of the idiom. During comprehension, constituent lemmas are activated by linguistic input. Activation then spreads to the lexical conceptual nodes of the component words and to the superlemma, which in turn activates its lexical conceptual node until some activation threshold is reached and the idiom is finally recognized. It must be noted, anyway, that the Configuration Hypothesis, differently from the Superlemma model, does not predict idiom activation to start

from the first word of the idiom, but just when the idiom key is encountered. Postulating that idiom activation kicks in at the idiom onset would actually be unrealistic and uneconomical for our cognitive system, since subjects beginning to process an idiom like *hit the wall* would be expected, at the idiom onset, to simultaneously activate also idioms like *hit the hay*, *hit the road*, *hit the mark*, *hit the roof* and so on, which all share the same verb. Most importantly, the Superlemma Hypothesis maintains that the syntactic features of each idiom and the syntactic transformations it allows are idiosyncratically specified in its superlemma entry. It follows that previous exposure to an idiom is necessary to know how to use it and which operations it can undergo. In this regard, Tabossi et al. (2009b) observe that when a group of Italian speakers from Rome (central Italy) and another group of Italian speakers from Trieste (north-eastern Italy) are asked to rate the acceptability of syntactic variants of idioms that are only known in the Rome area, the two groups express similar acceptability judgments. This finding suggests that being already familiar with an idiom is not a mandatory step to sensibly judge its syntactic behavior. Another corollary of the Superlemma theory is that a given syntactic transformation should be either acceptable or not acceptable for an idiom, depending on whether it is specified in its superlemma or not. What comes to the fore in Tabossi et al.'s (2009b) analysis is that acceptability judgments of idiom variants are rather nuanced than black-or-white and also depend on the specific sentence context in which the idiom variant is placed. Since, in a final experiment, the authors show that idioms are subject to the same general syntactic constraints of literal Italian language (e.g. bare nouns cannot be employed in preverbal position), they conclude on the basis of this collective evidence that idiom syntax is principled rather than idiosyncratic.

Although via a production study, Konopka and Bock (2009) present other evidence that discredits a lexicalist view of syntax, whereby sentence structure is derived from the syntactic specifications of individually activated words in the

lexicon (Jackendoff, 1997; Sprenger et al., 2006), and supports the role of abstract structural mechanisms in sentence formulation for both idiomatic and non-idiomatic language. They use a syntactic priming paradigm, in which participants read sentences containing idiomatic and literal phrasal verbs with either a post-object or a pre-object particle (e.g. *break the door down* vs *break down the door*), then engage in a distractor task and are finally asked to recall the sentence they just read. Konopka and Bock (2009) find that subjects transfer the particle position from prime to recalled target sentences both with idiomatic and non-idiomatic phrasal verbs. Hence, they conclude that idiom syntax resorts to general syntactic mechanisms in sentence production and it is separate from the lexicon. A hybrid view of idiom processing is also put forth by Titone and colleagues (Titone and Connine, 1999; Libben and Titone, 2008; Titone and Libben, 2014). Accordingly, idioms possess unitary representations in our mental lexicon that are directly accessed when idioms are familiar, but they can also be compositionally analyzed in late stages of comprehension. In an eye-tracking experiment, Titone and Connine (1999) find decomposable idioms to be read faster than nondecomposable idioms only when idioms are placed at the end of a sentence after a disambiguating context, while no decomposability effects turn up when idioms are read in sentence-initial position. Libben and Titone (2008) further investigate the effect of decomposability, and also familiarity, on idiom processing in four offline and online tasks: in a first experiment they collect normative ratings of decomposability, familiarity, meaningfulness, literality and predictability for a set of 219 English idioms, in a second experiment they record speeded forced-choice meaningfulness judgments for idiomatic sentences being displayed in their entirety, in a third experiment they still collect meaningfulness judgments displaying idiomatic sentences one word at a time at a fixed rate, and in a fourth and final experiment they record self-paced reading times of the same idiomatic sentences, still shown word-by-word, without any overt semantic task. While familiarity, which according to

the authors presumably reflects how easily idioms are retrieved wholesale from the mental lexicon, turns out to strongly facilitate comprehension across tasks, in line with previous studies (Cronk and Schweigert, 1992; Gibbs, 1980; Titone and Connine, 1994b), a role for decomposability emerges only in those tasks requiring an overt semantic judgment. In two cross-modal priming tasks, Titone and Libben (2014) shed further light on the role of familiarity and decomposability, together with literal plausibility. In the different experimental conditions, lexical decision is presented at three different time points, namely at the onset of the idiom final word, right at the idiom offset and 1000 ms after the idiom onset. The authors find an increasing priming effect for idioms going from the first to the third time point and also register an inhibiting effect of literal plausibility at the onset of the final word, a facilitating effect of familiarity at the offset of the idiom and, quite surprisingly, an inhibiting effect of decomposability 1000 ms after the idiom offset. All in all, Titone and colleagues (Titone and Connine, 1999; Libben and Titone, 2008; Titone and Libben, 2014) do not find any early effect of decomposability, but rather obtain evidence in favor of a late-stage facilitation of decomposability, when idioms must be integrated into a rich sentential context. These results stand at odds with the facilitating effect of decomposability detected by Caillies and Butcher (2007) in a visual-visual priming study on French. Titone and Libben (2014) hypothesize that this discrepancy might be due to the different structure of the stimuli, which were more semantically rich in Caillies and Butcher's (2007) study and therefore called for the selection and integration of a specific phrase meaning, or to the different modality of the priming task. Of note, the inhibiting effect of literal plausibility goes against the self-paced reading data by Cronk and Schweigert (1992), who find both a facilitating effect of familiarity and literal plausibility on idiom reading and take their evidence as being in favor of the simultaneous processing model advanced by Swinney and Cutler (1979), whereby both a direct look up of the idiomatic meaning and a literal and compositional

analysis of the string kick in at once.

As concerns psycholinguistic evidence on the processing of idiomatic variants, we have already seen that Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a) rely on the correlation between decomposability and flexibility they register to put forth their Idiom Decomposition Hypothesis. The variants studied by Gibbs and Nayak (1989) are verb inflection at the present participle (e.g. *Her father's laying down the law prevented her from going to the dance*), adjective insertion (e.g. *The teacher will lay down the school law if the children make too much noise in the hallways*), adverb insertion (e.g. *The boss will quickly lay down the law if anyone shows up late*), passivization (e.g. *The law will be laid down when Jane's boyfriend finds out where she's been*) and action nominalization (e.g. *The supervisor's laying down of the law was just what the staff needed*). Present participle and adverb insertion are rated by subjects as significantly more similar to the paraphrase of the unmodified idioms than all the other syntactic operations. Gibbs et al. (1989a) focus on lexical flexibility and semantic productivity and find them to be more acceptable in semantically decomposable and syntactically flexible idioms. Tabossi et al. (2009b) collect acceptability ratings for Italian idioms occurring with adjective insertion, adverb insertion, *wh*-movement and passivization in both a minimal and a richer context. Beside observing that using a richer context makes syntactic variants overall more acceptable, they also find that adverb insertion is the most accepted variant, with no significant differences between the other conditions. Geeraert et al. (2017b) conduct a rating experiment on a partially different range of idiom variants, including:

1. idioms in their canonical form (e.g. *Although these were new stocks, they suddenly went through the roof.*);
2. idiom string used in their literal sense (e.g. *While the guys were reshingling, they suddenly went through the roof.*);

3. a lexically varied form (e.g. *Although these were new stocks, they suddenly went through the ceiling.*);
4. a partial form with a component replaced by a pronoun (e.g. *Although these were new stocks, they suddenly went through it.*);
5. a form with an integrated concept, as with adjectival modification (e.g. *Although these were new stocks, they suddenly went through the investment roof.*);
6. a form that results from blending two different idioms (e.g. *Although these were new stocks, they suddenly went through the charts.*).

Subjects are instructed to express their acceptability judgment via a continuous Visual Analogue Scale. All in all, canonical forms and literal meanings are rated as the most and least acceptable conditions, respectively. As for the other operations, integrated concepts and lexical replacements result as more acceptable than partial forms and idiom blends. Acceptability ratings exhibit also significant interactions with the knowledge of the idioms, transparency and idiom length. Specifically, idioms which are known, more obvious in meaning, and shorter are considered to be more acceptable. Eye-tracking evidence collected on the same variants by Geeraert et al. (2017a) will be discussed in Chapter 3. McGlone et al. (1994) use offline rating and self-paced reading to study how semantic productivity in American English idioms is processed. In a first rating experiment in which subjects provide familiarity ratings on idioms and comprehensibility ratings of their variants, the authors find that more familiar idioms are easier to understand in a modified form. In a following self-paced reading experiment, they compare the reading times of original idioms, idiom variants and idiom literal paraphrases put in the final sentence of a story. Subjects are found to be significantly faster at reading the canonical form of the idiom, but to read idiom variants as fast as the

literal paraphrases. Building on this evidence, they lay out a processing strategy according to which speakers access canonical forms of idioms wholesale, and process their variants more slowly and compositionally like literal phrases. Despite the importance of this study, which has been one of the first to investigate online processing of idiom variants, a shortcoming it presents is that the authors collapse various instances of formal variations altogether instead of balancing them or addressing them separately, like lexical variations (e.g. *to be the white sheep of the family*), quantifier variations (e.g. *not spill a single bean*), and hyperboles (e.g. *miss the entire fleet* from *miss the boat*). Idiom variability is also investigated in production, as in Cutting and Bock's (1997) study, where the authors analyze idiom blends in a speech-error elicitation task. In the experiment, speakers are presented with two idioms displayed at once on a screen and are probed to produce one of the two idioms after a delay. What comes to the fore is that idiom blends, that consist in a word from an idiom replacing a word in another idiom, like *kick the maker* from *kick the bucket* and *meet the maker*, tend to be produced more often when the two idioms share a similar syntax or semantics, but no decomposability effects are found.

In summary, while non-compositional models (Bobrow and Bell, 1973; Swinney and Cutler, 1979; Gibbs, 1980) hold that idioms are represented as semantically empty and syntactically rigid lengthy words in our mental lexicon, converging psycholinguistic evidence reveals that both the semantics of single idiom constituents and the syntactic structure of idioms are activated to some degree during processing (Cacciari and Tabossi, 1988; Konopka and Bock, 2009). With respect to early lexical look-up models, more recent data rather support a hybrid view of idiom processing, whereby both word-by-word compositional analysis of the idiomatic string and direct access to the idiomatic meaning come into play at different time points and interact with each other (Cacciari and Tabossi, 1988; Sprenger et al., 2006; Titone and Libben, 2014). Idioms seem thus to have unitary representa-

tions in our mental lexicon that are nonetheless connected to the representations of their component lemmas (Sprenger et al., 2006). Anyway, as Tabossi et al. (2009b) show, these unitary representation do not idiosyncratically store information about the syntax of each idiom, which rather looks to obey general syntactic rules of languages in a principled way. All in all, the processing of idioms, and also idiomatic variants, appears to be sped up by familiarity (McGlone et al., 1994; Libben and Titone, 2008; Titone and Libben, 2014; Geeraert et al., 2017a,b), while decomposability effects turn out to kick in at late stages of processing (Titone and Libben, 2014). Literal plausibility, by contrast, apparently slows down processing, in that it brings on some competition between a possible literal or figurative reading of the idiomatic string (Titone and Libben, 2014). As regards the processing of idiom variants, offline ratings show that variations that alter idiom structure in a minimal way like adverb insertion are rated as more conservative of the original idiomatic meaning with respect to transformations like passivization, adjective insertion and *wh*-movement (Gibbs and Nayak, 1989; Tabossi et al., 2009b). Other studies show that variants like adjective insertion and lexical replacement are rated as more acceptable than truncated forms and idiom blends (Geeraert et al., 2017b). Online evidence suggests anyway that idiom variants are read more slowly than idiom canonical forms but as fast as literal phrases (McGlone et al., 1994). Generally speaking, the processing of idiom variants turns out to be facilitated by semantic decomposability, transparency and familiarity (Gibbs and Nayak, 1989; Gibbs et al., 1989a; McGlone et al., 1994; Geeraert et al., 2017b).

1.5 Corpus-based studies on idioms and idiomatic variability

The studies we are going to review in this section all share the use of corpora as data sources to investigate idiomaticity and idiomatic variability. On the one hand, computational linguists and Natural Language Processing (NLP) researchers are interested in devising algorithms that effectively tease apart potentially idiomatic constructions from only literal ones and that discriminate between idiomatic and literal usages of target expressions in corpora to automatically generate and update multiword-aware lexica and to improve the performance of NLP tasks such as semantic parsing, machine translation and knowledge extraction (Sag et al., 2002; Ramisch, 2015; Constant et al., 2017). On the other hand, since such algorithms must necessarily rely on linguistically informed features (e.g. semantic compositionality or formal fixedness) to carry out the intended tasks, evaluating their performance can also be of theoretical interest for linguists, because it can give a sense of how actually discriminating those features are for the phenomenon under scrutiny. In addition, linguists can also draw on corpus data to conduct qualitative inspections of selected sets of occurrences of the phenomena they are investigating to carefully analyze their case-by-case properties. Therefore, taking advantage of data from large-scale corpora allows researchers to gain an insight into the actual occurrence and distribution of linguistic phenomena in language use without having to collect information from large pools of informants. After reviewing existing computational approaches to idiom type and token identification in Section 1.5.1, we will go through qualitative and quantitative corpus studies that have investigated the distribution and the determinants of idiom variability (Section 1.5.2).

1.5.1 Computational research on idiom identification

As stressed by Sag et al. (2002) and Calzolari et al. (2002) in their trailblazing works on the automatic processing of multiword units, idioms and multiword expressions in general are “a pain in the neck” for NLP systems and pose them a serious challenge because their formal and semantic idiosyncratic properties make them hard to identify and to treat automatically. Idiomatic expressions, specifically, are semantically non-compositional, so a syntactic or semantic parser and a machine translation system should be aware that the phrase *get the sack* in a sentence like *John got the sack of potatoes from the top shelf* has a very different meaning from the one it takes in *John got the sack because he was always late on the job*. Some idioms like *by and large* or *trip the light fantastic* can also give syntactic parsers a hard time due to their syntactic ill-formedness, which translates into anomalous Part-Of-Speech (POS) sequences. Multiword expressions-aware systems should also pay attention to the restricted formal versatility of idioms with respect to compositional language and to the potential discontinuity of idiomatic forms. In the first case, for instance, pluralizations or passivizations like *kick the buckets* or *the bucket was kicked* should not be straightforwardly labeled as idiomatic instances of *kick the bucket* but should be carefully analyzed in light of their context of occurrence. In the second case, idioms with an empty syntactic slot like *take X to the cleaners* or *jog X’s memory* must be correctly parsed as a unique phrase in spite of the presence of intervening material. Idiom type and token detection algorithms that have been devised in the literature try therefore to identify idioms by keeping these idiosyncrasies in mind.

Non-distributional approaches to idiom type identification

Idiom type classification consists in separating potentially idiomatic constructions (e.g. *spill the beans*) from constructions that can only have a literal meaning (e.g.

write a letter). Studies like Gralinski (2012) perform this task by relying just on the presence of shallow features like metalinguistic markers (e.g. *proverbially, literally*) and quotation marks. Most notably, other works take advantage of typical linguistic features of multiwords and idioms to perform classification. One of these features is *collocability*, namely the fact that the component words of a multiword unit tend to co-occur more often than chance, which can be measured via association measures like Pointwise Mutual Information (PMI; Church and Hanks 1991). Other features include lexical non-substitutability of idiom component words and semantic non-compositionality. The latter, as we will see, operationally translates into a different distribution of the idiom component words with respect to idioms as wholes and can be measured via thesaurus-based indices of semantic overlapping (McCarthy et al., 2003) or distributional semantic measures of non-compositionality (Baldwin et al., 2003; Venkatapathy and Joshi, 2005; Fazly and Stevenson, 2008). The algorithms proposed in the literature on automatic idiom classification are both supervised, where at least part of the training data are already labeled as idioms and non-idioms and the algorithm has to learn a function that correctly classifies the expressions under investigation, and unsupervised, where the goal is to learn the inherent structure of input data without resorting to provided labels. Of note, some of the works we will review in this paragraph concern multiword identification in general and are not focused on idioms specifically. We will anyway take them into consideration because they still include idioms in their broader-scope datasets and also because the kind of linguistic features they focus on are typical of idioms as well. While the purpose of this section is to provide readers with a general introduction and review on existing computational approaches to idiomaticity, studies that are more specifically focused on the use of lexical substitution and distributional semantics to assess compositionality will be more extensively reviewed in Section 2.2.

Smadja (1993) devises the *Xtract* toolkit to extract various kinds of collocations, including idiomatic phrases, by filtering candidate bigrams with the z-score. This collocational measure, like PMI, compares the observed joint frequency of two words with the predicted co-occurrence frequency if they were to co-occur by chance. Z-score in *Xtract* is associated with other heuristics like the systematic co-occurrence pattern of two words at a similar distance. Tapanainen et al. (1998), as we will see in Chapter 2 in more detail, compare the frequency of a given noun as object with the number of verbs that appear with that object, predicting that idiomatic objects occur with just one or a few verbs at most, given the greater lexical restriction in idiomatic phrases. Lin (1999) takes advantage of the lexical fixedness typically exhibited by non-compositional phrases to devise an index that classifies a phrase as non-compositional if the mutual information between its components, that computes if they co-occur more often than chance (Church and Hanks, 1991), is significantly different from the mutual information between the components of its variants. Each of these variants is obtained by replacing one word in the original phrase with a semantic neighbour obtained from a thesaurus (Lin, 1998). Evert et al. (2004) focus on German adjective-noun combinations and compute their morphosyntactic preferences for number and case as a clue to their idiomatic or collocation-like status. In a similar spirit, Ritz and Heid (2006) extract verb-noun combinations and use frequency information on the occurrence of the noun in the singular or in the plural or on the existence and type of determiner to retrieve collocations and idiomatic constructions from the extracted combinations. Widdows and Dorow (2005) resort to Hearst’s (1992) concept of *lexicosyntactic pattern* and extract asymmetric combinations such as *A and/or B* which never occur in the reversed order *B and/or A* in their corpus. Such a fixed linear order emerges as a clue of various kinds of relationships between the lexemes pairs, among which idiomatic ones. Wermter and Hahn (2004) aim at spotting out idiomatic preposition-noun-verb combinations in German by assessing variability

in the presence of supplementary lexical information between the preposition and the verb. For each combination, the probability of seeing each piece of supplementary material is computed and taken as its degree of fixedness. This score is then multiplied by the probability of occurrence of the phrase, obtaining a final score that outperforms other lexical association measures like *t*-score, log-likelihood ratio and also frequency. Also Bannard (2007) focuses on syntactic fixedness to identify multiword and idiomatic verb-noun phrases in corpora, using conditional PMI to calculate how the syntactic variation of a target verb-noun pair differs from what would be expected considering the variation of the single lexemes that compose it. The syntactic dimensions he takes into account are determiner variability, internal adjectival modification and passivization. The more deviant the behavior of a target pair from the behavior of its single component words with respect to the three axes of variation, the higher the conditional PMI and the more idiomatic or multiword-like the construction. Bannard (2007) also shows this syntactic fixedness index to return more accurate results with respect to traditional lexical association measures like *t*-score, χ -square and log-likelihood ratio. As a multiwordness index, Villavicencio et al. (2007) and Ramisch et al. (2008a) use permutation entropy, which indicates how uncertain the occurrence of a given word combination is with respect to the reciprocal order of its constituents. The probabilities of the different word orders of a certain combination are estimated from the number of occurrences of each permutation like *by and large*, *large by and*, *and large by*, *and by large*, *large and by*, *and by large and*. The combination of a lexical flexibility index with a syntactic flexibility index is used by Fazly et al. (2009) to carry out verb-noun idiom type identification. The lexical flexibility index elaborates on Lin's (1999) one and starts from the creation of a series of lexical variants for the target expressions to be classified. These variants are once again created by replacing the verb and the noun of the target phrase with semantically related words extracted from a thesaurus. Flexibility is then computed as

the difference between the PMI of the components of an original target phrase and the average PMIs between the components of all the lexical variants of the same phrase. Syntactic flexibility is then measured as the Kullback-Leibler divergence (Cover and Thomas, 1991) between the syntactic behavior of a target verb-noun pair and the behavior of a typical verb-noun pair with respect to three variational dimensions, namely the voice of the verb, the number of the noun and the type of determiner. Both indices are finally combined into an overall fixedness index. Muzny and Zettlemoyer (2013) propose a supervised technique for identifying idioms among the Wiktionary lexical entries with lexical and graph-based features extracted from Wiktionary and WordNet. Lexical features compute the synonym overlap between a phrase to be classified and its definition, while graph-based features measure the distance between a target phrase and its definition in WordNet (Miller, 1995; Fellbaum, 1998).

Distributional semantic approaches to idiom type identification

Other idiom type identification approaches are based on Distributional Semantic Models (DSMs), also known as vector space models (Sahlgren, 2006; Lenci, 2008; Baroni and Lenci, 2010; Turney and Pantel, 2010; Erk, 2012; Mikolov et al., 2013a; Clark, 2015; Lenci, 2018), namely usage-based models of meaning that have gained momentum over the past decades in computational linguistic research. The theoretical foundation of these models lies in the *Distributional Hypothesis* by American structuralist Harris (1954), whereby words that have a similar meaning tend to occur in similar contexts. Semantic similarity between words and phrases is thus conceived of as a function of the contexts these words and phrases appear in (Miller and Charles, 1991). Distributional semantics has been of interest to psychologists and cognitive scientists as well (Miller and Charles, 1991), who, adhering to a strong and cognitively committed version of the distributional hypothesis, ar-

gued for a causal role of distributional context in shaping our representation of word meaning (McRae and Jones, 2013). Since the first implementations of the distributional methodology in information retrieval (Salton et al., 1975), the distributional properties of lexical items in DSMs have been represented as vectors in a co-occurrence matrix, where the vector dimensions encode the co-occurrence statistics of the target lexical items with some contextual features. Such linguistic contexts can be defined in a variety of ways in DSMs, the most common one being the collocates of the target lexical item, i.e. the other words that co-occur in the same context as the target (Firth, 1957). These context words are a subset of the corpus vocabulary and may coincide with the targets. Semantically uninformative words, like grammatical function words, are usually left out of distributional space implementation. Co-occurrence counts may be collected in different ways. In linear DSMs, the collocates of a target word are the contextual words that occur within a certain linear distance from the target, as specified by a context window. In structured DSMs (Padó and Lapata, 2007; Baroni and Lenci, 2010), co-occurrences between a target lexeme t and a contextual lexeme c consist in $\langle t, r, c \rangle$ triples, where r stands for the syntactic dependency between t and c . The rationale behind these models is that the syntactic relation between two words can act as a cue of their semantic relation (Grefenstette, 1994; Turney, 2006; Padó and Lapata, 2007). Weighting functions are usually applied to the co-occurrence matrix instead of leaving raw frequency data, which follow a Zipfian distribution, with very few frequent words and a large number of rare words. Because of this skewed distribution, non-transformed co-occurrence matrices tend to be sparse, with an integral part of co-occurrences that end up not being encountered in corpora. The most frequently employed association measure is Positive Pointwise Mutual Information (PPMI; Bullinaria and Levy 2007; Evert 2008), a statistical association measure that assesses whether two elements x and y co-occur with a probability that is higher than what would be expected if they were to co-occur

by chance and sets to zero all the negative results:

$$PPMI(c, t) = \max(0, \log \frac{P(c, t)}{P(c)P(t)})$$

These raw-frequency or weighted matrices, which usually have high dimensionality and tend to be sparse, contain *explicit* vector representations since the vector dimensions are still interpretable, for instance as specific collocate words. In order to account for data sparseness and also to detect generalizations and similarities across dimensions, dimensionality reduction techniques like Singular Value Decomposition (SVD; Deerwester et al. 1990), Principal Components Analysis (PCA), and Nonnegative Matrix Factorization (NMF) can be applied to the original matrix, therefore mapping the high-dimensionality co-occurrence data to a space of fewer latent dimensions and creating *implicit* vector representations, whose dimensions cannot be directly interpreted as explicit contextual features anymore. Semantic similarity between two words u and v can be modeled via a series of vector similarity measures, the most popular being *cosine similarity*. This value spans from -1 (or 0 if vectors do not include negative values) to 1. The higher the value, the more semantically similar the two words:

$$\cos(u, v) = \frac{u \cdot v}{\|u\| \|v\|} = \frac{\sum_{i=1}^n u_i v_i}{\sqrt{\sum_{i=1}^n u_i^2} \sqrt{\sum_{i=1}^n v_i^2}}$$

Beside count-based models, which are based on collecting linear or syntax-based co-occurrence statistics, another family of DSMs that have becoming increasingly popular in distributional semantic research are prediction-based models (Mikolov et al., 2013a; Baroni et al., 2014), i.e. neural network algorithms that directly output low-dimensional implicit vector representations (*neural word embeddings*) by learning to predict a target word from its context or the context from the target word as in the *Continuous Bag of Words* (CBOW) model and the *skip-gram* model of the `word2vec` library respectively (Mikolov et al., 2013a,b). Anyway, it is

still debated whether these models actually perform better than count-based ones (Levy et al., 2015; Mandera et al., 2017). Research in distributional semantics has also focused on representing the meaning of more complex expressions than just single words and thus on finding an effective way to distributionally model semantic compositionality (Mitchell and Lapata, 2010; Krčmář et al., 2013). For instance, the vectors for complex phrases are modeled by summing or multiplying the vectors of the phrase components or with vector dilation (Mitchell and Lapata, 2010). Others adopt tensor-by-vector multiplication as a composition method, as Baroni and Zamparelli (2010) do to model adjective-noun compositionality. In their proposal, the vector for an adjective-noun phrase is obtained by multiplying the noun vector by a weight matrix representing the adjective. In Chapter 2, we will describe a distributional-semantic method we elaborated to automatically classify expressions as idioms or non-idioms by virtue of their lexical rigidity.

Moving on to distributional approaches to idiom type identification, McCarthy et al. (2003) resort to a thesaurus to calculate the overlap between the neighbors of a phrasal verb and those of its simplex verb, while both Baldwin et al. (2003) and Reddy et al. (2011) make use of DSMs to measure the cosine distance between the vector of a phrasal verb or a noun-noun compound and the vectors of their component words, expecting the vectors of less compositional and more idiomatic phrasal verbs and compounds to be less similar to the vectors of their components. Krčmář et al. (2013) review a variety of DSM-based measures that grasp the compositionality of complex phrases. Such indices include distributional similarity between whole phrase vectors and component vectors, distributional similarity between the vector of a combination taken as a whole and the sum or product vectors of its components, and a comparison between the the nearest neighbors of a combination with those of its constituents. To classify verb-noun combinations as literals, phrases implying an abstract transfer (e.g. *give confidence*), light verb constructions and idioms, Fazly and Stevenson (2008), in addition to the lexi-

cosyntactic fixedness index presented in Fazly et al. (2009), also compute cosine similarity between the vector of a whole phrase and: a) the vector of the noun, b) the vector of the verb, c) the sum vector of the verb plus the noun, and also d) the vector of a verb that is morphologically related to the noun (e.g. between *give a groan* and *groan*), so as to spot out light verb phrases.

In a series of contributions that fall beyond the scope of the present dissertation, we try to understand if a three-layered fully connected neural network that is given count-vectors of Italian idioms and non-idioms can learn to automatically distinguish between the two classes of expressions (Bizzoni et al., 2017, 2018). Quite interestingly, our results suggest that the distributional context of a given phrase provides sufficient information for a neural network to satisfactorily perform idiom type identification. Classification performance further increases when input phrases are filtered according to human-elicited idiomaticity ratings collected for the same expressions. Given idioms' non-compositionality, the best results are predictably obtained when vectors for each phrase taken as a whole token are used as input instead of concatenations of the vectors of the component words of the target phrases. Given the long-debated difficulty to make sense of the performance of neural networks because their non-linearity and continuous representation make it hard to map their hidden states to interpretable language structures (Ding et al., 2017), we carried out an ablation study on a group of both Italian and English target idioms and non-idioms (Senaldi et al., 2019) to understand which kind of semantic information the network takes from distributional vectors to perform the classification task. In the ablation experiment (Senaldi et al., 2019), we selectively leave out part of the input phrases in different models to see how this affects the network classification performance. In our prediction, the neural network could be so effective in identifying idioms because because it could take advantage of the fact that idioms are all in all less concrete in meaning with respect to non-idioms or because many idioms in our dataset are ambiguous

and can receive both a literal and a figurative meaning. Accordingly, the neural network could identify a more variegated contextual distribution for ambiguous idiomatic phrases with respect to only compositional expressions. In a first type of models, we therefore filter out the most concrete literals and just keep abstract idioms and abstract non-idioms. In a second type of models, we leave out the most ambiguous idioms, ending up with non-ambiguous idioms and non-ambiguous literal phrases. Interestingly, while leaving out ambiguous idioms does not result in a considerably worse performance by the network, the classification performance plummets down to far lower scores when the difference in concreteness between idioms and non-idioms that are given as input is evened out. This shows that one of the most important pieces of distributional semantic information that the neural classifier is leveraging to single out idioms is their greater abstractness. Since Nunberg et al. (1994) stress that one of the defining features of idioms is their emotive value in that they often imply some affective stance of the speakers toward the event they denote, in another computational work (Passaro et al., 2019), we use distributional semantics to compare the emotional content of idiomatic and non-idiomatic phrases. In this regard, Williams et al. (2015) show that including idiom-related features can actually improve the performance of sentiment analysis algorithms. We first of all collect valence and arousal ratings for a set of Italian idioms and non-idioms. While valence refers to how positive or negative the concept conveyed by a given expression is, arousal says how emotionally intense the described event is. We then compute an emotional polarity score for our target idioms and non-idioms by means of an already existing vector-based model that computes the emotional content of target expressions by measuring the cosine similarity between a target and a centroid vector encoding a specific emotion (Passaro et al., 2015). The correlation analysis between such a score and human-rated valence revealed a high correlation among the two variables and a significantly lower polarity score for idioms, that reflects their stronger negative

content.

Idiom token identification

Idiom token classification, on the other side, consists in recognizing whether a certain word combination is used idiomatically or literally in running text (e.g. *The old man kicked the bucket two years ago* vs *Entering the junk room, I accidentally kicked a metal bucket*). Although more or less fine-grained differences actually exist within all the possible idiomatic or literal usages of an expression, for the task at issue idiomatic and literal usages are clustered as two coarse-grained meanings that a given construction can assume according to the context (Fazly et al., 2009). Idiomatic token detection can be performed with supervised (Katz and Giesbrecht, 2006; Diab and Krishna, 2009; Hashimoto et al., 2006), weakly supervised (Birke and Sarkar, 2006) and unsupervised (Fazly et al., 2009; Sporleder and Li, 2009; Feldman and Peng, 2013) algorithms. Katz and Giesbrecht (2006) first conduct a manual annotation of all the occurrences of given German word-combination as idiomatic or literal, encode each of the two senses as a meaning vector and determine which one is closer to the vector of the token they want to disambiguate. Diab and Krishna (2009) compare the context vector of a token verb-noun combination to be classified with a combination of the vectors of the verb and the noun taken in isolation. To compute the token vector, they insert a rich contextual evidence, including prepositions, determiners and, finally, the collocates of the whole paragraph and not just of the sentence. Hashimoto et al. (2006) manually put together an idiom dictionary containing useful lexical and syntactic information to identify different kinds of Japanese idioms in context, for instance by listing the different syntactic transformations they may undergo and those morphosyntactic patterns under which the target constructions lose their idiomatic value. In a follow-up contribution (Hashimoto and Kawahara, 2008), they

build a corpus of Japanese idioms and use a Word Sense Disambiguation (WSD) method based on Support Vector Machines (SVMs) that takes advantage of both common WSD features and idiom-related disambiguating features taken from their previous work. Also Birke and Sarkar (2006) resort to a WSD algorithm which compares a target sentence to two seed sets, one composed of non-literal sentences and the other containing literal ones. Such feedback sets are created automatically, but their sentences contain synonyms of the target expressions that are extracted from WordNet (Fellbaum, 1998) and a database of idioms and metaphors. In the token-detection section of their study, Fazly et al. (2009) statistically determine the canonical form of a given idiom, which consists in the morphosyntactic form it preferably occurs with, by exploiting frequency information and come up with an unsupervised classifier that labels a token as idiomatic if it appears in the canonical form and as literal otherwise. Sporleder and Li's (2009) approach relies on lexical cohesion to detect idioms in context. The authors build a cohesion graph in which vertices correspond to the words of a sentence and the edges that connect them are weighted with respect to their semantic relatedness. They go on to analyze how the overall connectivity of the graph is affected by the removal of the target expression. If connectivity increases after removal, the token is labeled as idiomatic. In a follow-up (Li and Sporleder, 2009), cohesion-based classification is followed by a supervised step that makes use of a SVM classifier. The features that are given to the classifier are the saliency of the context words for the literal interpretation of the token, the semantic relatedness between the token and the contextual words and the connectivity of the cohesion graph. In Li and Sporleder (2010a), this feature set is enriched with other features like the words immediately preceding and following the target word, the occurrence of named entities and the presence of metalinguistic markers. The topic model devised by Li et al. (2010) chooses the sense of the target phrase that has the highest probability given the context, where each sense is represented by a collection of independent words rep-

representing its paraphrase that are drawn from idiom dictionaries or linguistic introspection. Using a Gaussian Mixture Model to perform idiom token identification, Li and Sporleder (2010b) start from the assumption that literal and non-literal data are respectively generated by two different Gaussians. Classification takes place by selecting the Gaussian with the higher probability of generating a target instance. Feldman and Peng (2013) apply Principal Component Analysis to extract idioms as semantic outliers and Linear Discriminant Analysis. The same concept of idioms as semantic outliers lies at the root of Peng et al.'s (2014) paper. In a supervised fashion, they extract topics from paragraphs including verb-noun combinations used as either idioms or literals via Latent Dirichlet Allocation and hypothesize that words that appear as high-ranking representatives of common topics are less likely to belong to an idiomatic expression in a document. A series of models are then trained to classify idioms vs literals in context by using the topic term document matrix to project the target phrases into a topic space representation and label outliers within the topic space as idiomatic. On top of that, the emotional arousal associated with each idiom in the dataset is extracted from a normative database and included in the feature set, resulting in a better classification performance. Peng and Feldman's (2015) word embedding-based approach builds on the assumption that idioms and literals occur in very different contexts and that vectors of literal expressions should be more predictive of their context words with respect to idiomatic vectors. The inner product of context word vectors with target phrase vectors is then computed and the inner product of literal phrases with contexts is shown to be larger with respect to idiomatic phrases. To compare the distribution of idioms and literals, literal and idiomatic scatter matrices, representing their contextual distribution, are computed from local contexts in a word vector space and are then compared using the Frobenius norm. Verma and Vuppuluri (2015) propose a domain and language independent approach that is based on subtracting the set of content words that make up the

definition of an idiom from the concatenated sets of content words that compose the definitions of the component words of the expression to be classified. Since the definition of an idiom is expected to have a few words in common with the definition of its component words, the phrase under scrutiny is thus labeled as an idiom if at least one word survives the subtraction operation. Finally, Salton et al. (2016) experiment with different machine learning algorithms (K-Nearest Neighbours and SVMs) to detect idioms on the basis of the distributed representations of the sentences they occur in. These distributed representations are modeled with Skip-Thought Vectors (or Sent2Vec; Kiros et al. 2015) in an unsupervised manner. Skip-Thought vectors are an implementation of a Recurrent Neural Network-based encoder that takes an input sentence and maps it into a vector of real numbers. Classifiers using these representations are shown to perform comparably to idiom token classification models like Peng et al.’s (2014) one.

1.5.2 Corpus evidence on idiomatic variability

One of the first and largest corpus-based investigations on idiom flexibility is carried out by Moon (1998), who resorts to the Oxford Hector Pilot Corpus (OHPC henceforth) and the Bank of English (BofE) for her descriptive analysis. She refers to the class of expressions under investigation with the umbrella term of Fixed Expressions and Idioms (FEIs), namely holistic units of two or more words encompassing collocations, saying, proverbs, conversational routines, similes and, most importantly, idioms. These FEIs are said to undergo a lexicalization process, whereby “a string of words and morphemes becomes institutionalized as part of the language and develops its own specialist meaning or function” (Moon, 1998, p.36). Despite their institutionalized status, Moon (1998) relies on her corpus data to observe that these word combinations are far from being frozen and that a variety of both syntactic and lexical transformations can actually take place in proper

contextual conditions. A first instance of syntactic transformation is polarity reversal. A few FEIs are conventionally negative and have a negation in their base form, like *leave no stone unturned* and *not lift a finger*, and can sometimes occur in reversed polarity, although still implying some kind of negative evaluation of the event being described, as in:

- (19) He wanted to have his cake and eat it – somehow to marry Mrs. Simpson and yet to remain on the throne (OHPC).

Another observed transformation is passivization, which will become of interest in Chapter 3. While some FEIs are never found to be passivized, Moon (1998) finds other to be as frequent in the passive as they are in the active form, like *X bears Y in mind/Y is borne in mind* or *X hauls Y over the coals/Y is hauled over the coals*. As Nunberg et al. (1994) already point out, a less frequent case is double passivization for idioms with canonical double object or prepositional dative form, where both the direct object and the indirect or prepositional object can become subject, as in the case of *X pays lip service to Y/Y is paid lip service/lip service is paid to Y*. Other idioms are classified by Moon (1998) as already having canonical passive forms, like *X is paved with gold* or *X is strapped for cash*, while others would imply a mass noun subject and are never found in the active form in the OHPC, like *X is laughed out of court*. Another slightly different case is represented by idioms like *the die is cast*, which are so strongly embedded in the English language as passives, also because of the cultural and historical references they bring into play, that putting them in the active as in *X casts a die* would sound strained and unnatural. Moon's (1998) explanation for idiom general recalcitrance to passivization draws on Newmeyer's (1974) account, according to which idioms like *bury the hatchet* and *spill the beans* can undergo verb voice shift because their literal equivalents can go passive and their idiomatic meanings contain passivable predicates, differently from *kick the bucket* and *blow one's top*, whose meanings

are one-place predicates. Nonfinite use of idioms is also dealt with as a possible syntactic variant, although it has to be noted that this is just a matter of verbal inflection that does not alter the internal structure of the expression, as in this example from the OHPC:

- (20) Again, original, perfectly sound wooden parts were destroyed and, to add insult to injury, plastic, press-moulded doors inserted.

Other FEIs are found by Moon (1998) to undergo embedding, where a FEI component is relegated to a relative clause, a catenated infinitive or a cleft structure and depends on a component noun in the FEI, as in the following example:

- (21) Another straw at which we can clutch is that if real snow arrives in the near future it will be falling on cold slopes and so will last reasonably well. (OHPC)

- (22) This may be a hard bullet for the left to bite, but there is no question of what families want. (OHPC)

Despite being rare, these embedding examples appear to be pragmatically well-formed and probably reflect thematization or cohesion requirements at the discourse or information-structure level. Another phenomenon detected in the corpus is pronominalization of FEI subparts, which is probably influenced by the internal semantics of the expressions and which anyway does not always result in straightforwardly acceptable sentences. Moon (1998), for instance, points out that while the first example appears more acceptable, the second one is accepted only by some scholars:

- (23) He turned the tables on me and then I turned them on him.

(24) I'll keep an eye on him and one on her too.

The author concludes that “it may simply be that the tight relationship between lexicogrammatical form and meaning in FEIs precludes pronominalization which might obscure the gestalt” (Moon, 1998, p.112) and that in this regard, the only isolated examples of pronominalization she finds in the OHPC present the missing nominal group right before the pronominalized idiom, so the reference is maintained clear:

(25) So Europe is being carried towards a durable system of fixed exchange rates on the tide of history. Mr Lawson was swimming with that tide. Mrs Thatcher is swimming against it.

Three kinds of nominalization are then traced in the OHPC. The first one is when a FEI is truncated and an allusion to the idiomatic meaning of the whole expression is kept by a FEI subpart also when used in isolation, as in the case of *second fiddle* which alludes to the whole idiom *play second fiddle to someone*. In the second type, the idiom verb occurs as a verbal noun or a participial adjective or it is substituted by a cognate noun, as in *a kick in the teeth* coming from *kick someone in the teeth* or in *a waste of breath* which is the result of a nominalization from *waste one's breath*. Finally, in the third kind, a new compound is formed, like *trailblazer* from *blaze a trail* or *ice-breaker* from *break the ice*. By means of specific clausal positioning and often hyphenation, instances of idioms becoming adjectives are spotted as well, as *on-the-spot* from *on the spot* or *tongue-in-cheek* from *with tongue in cheek*. A final kind of syntactic transformation that is investigated does not actually modify an existing idiom but rather creates a new one by extracting a verbal phrase from a proverb that contextualizes its universal-truth or deontic content, like when *make hay* is used to denote an activity being performed under favorable conditions without mentioning the whole proverb *make the hay while*

the sun shines or when the proverb *don't look a gift-horse in the mouth* is used as the idiom *look a gift-horse in the mouth*. Different kinds of lexical variation are also looked through by Moon (1998). They involve different FEI parts and do not always have the same function, creating a semantically equivalent variant in some cases and bringing about a shift in register, focus or intensity in other cases. Verb variation, for instance, may reflect a superordinate/hyponym alternation (e.g. *fit/fill the bill*, *set/start the ball rolling*), an alternation between a verb and a phrasal verb (e.g. *blow up/explode in one's face*, *step into/fill someone's shoes*), or an alternation in focus or degree (e.g. *hang in the air/be left hanging in the air*, *keep/juggle the balls in the air*). Noun variation may regard near-synonyms (e.g. *tempt fate/providence*, *the calm/lull before the storm*), number alternation (e.g. *skin and bone/bones*, *test the water/waters*), distinction between a superordinate and a hyponym or meronym (e.g. *hang on by one's fingertips/fingernails*, *from head to foot/toe*) or alternation between nouns that are not synonym outside the expression at issue (e.g. *leave someone holding the baby/bag*, *miss the boat/bus*). Lexical flexibility may also affect adjectives and modifiers (e.g. *the best/greatest thing since sliced bread*, *a bad/rotten apple*), particles (e.g. *out of thin air/from thin air*, *by/in leaps and bounds*) and the discretionary presence of an internal adjective or an adverbial that can intensify or specify the meaning of the idiom (e.g. *like a (hot) knife through butter*, *(out) on a limb*). The downgrading of an entire proverb to a lower-level phrase that Moon (1998) brings up when tackling syntactic transformations is also dealt with in regard to lexical modification, since it also has the effect to truncate the idiom and create a smaller institutionalized lexical unit, as *a bird in the hand (is worth two in the bush)* or *birds of a feather (flock together)*. In Moon's (1998) perspective, FEIs have a fixed canonical form, from which idiom variants originate and are understood as idiomatic because they activate their respective *idiom schemas*. These schemas "represent[s] concepts embedded in the culture and associated with particular lexicalizations" (Moon, 1998, p.163) and

are clusters of idiomatic expressions that share a similar underlying metaphor and feature common lexical items, but vary in their structure or lexis, like the following group of idioms, all denoting a state of apprehension, where the verb means something like ‘to shake’ and the nouns refer to footwear of some kind:

- (26) a. shake in one’s shoes
b. quake in one’s shoes
c. shake in one’s boots
d. quake in one’s boots
e. quiver in one’s boots
f. quake in one’s Doc Marten’s

Moon (1998) makes the point that compositional FEIs have clearer schemas, while non-compositional FEIs have more frozen lexicalization patterns. Taylor (2012) analyzes similar idiom clusters and points out that plenty of them display greater semantic variability with the noun slot than with the verb slot (e.g. *knock the stuffing/wind/guts/socks out of someone* vs *beat/blast/blow the hell out of someone*). He also proposes to take into account the frequency of each variant in the schema, since not all of them occur equally often. In the 100M-token British National Corpus (BNC), for instance, *knock the stuffing out of someone* occurs 16 times and it is the most frequent in the schema, while *knock the wind out of someone* occurs 2 times and the variant with *guts* just once.

Barlow (2000) tracks down formal variants of the two proverbs *it ain’t over till the fat lady sings* and *make hay while the sun shines* in the Corpus of Spoken Professional American English to support his usage-based views of the grammar as composed of prefabricated chunks of varying complexity and specificity which

merge with one another via blending processes to give rise to creative uses of language. As already noted by Moon (1998), a proverb can be downgraded to a lower-level phrase to refer to a specific situation, with context-specific referents operating a conceptual blending with portions of the phrase. In the following example, the competition becomes the contextual subject of the phrase and a further reference to the phrase is made in the second sentence, with the fat lady rehearsing indicating the battle being still in progress:

- (27) No competition is over until the fat lady sings. The current status of the battle over the megaplex location suggests she is only in rehearsal.

In other examples, Barlow (2000) notices that the conceptual blending of a phrase with the contextual referents can also result in a deviation from the canonical form of the proverb:

- (28) They resumed normal business with the resilient message that the fat lady is still a long way from breaking into song.

In his book-length contribution, Langlotz (2006) lays out a cognitive-linguistic account of idiomatic variation and creativity. In this framework, idioms are conceived of as “complex linguistic routines which are mentally represented as activation sets” (Langlotz, 2006, p.175). Such idiomatic activation sets are to be intended as mental networks that get activated when a given idiom is used and that encompass various symbolic and semantic substructures associated with the idiom. Idiomatic variation takes place as an effect of creativity applied to idiomatic activation sets in response to the communicative urge of speakers to adapt the context-independent base forms of idioms to code complex conceptualizations in a contextually appropriate way. Properly adapting an idiom to a context calls for the mental coordination between the level of the discourse to be encoded, the entrenched idiomatic meaning of the phrase and the literal meaning of the idiomatic

string. In his analysis of a set of British idioms in the BNC, Langlotz (2006) outlines five variation patterns, namely:

- constructional adaptation, which involves the systematic inflectional and syntactic modification of an idiom, as in the case of article variation, number variation, passivisation and fronting/topicalization (e.g. *South-East Thames is facing a potential 5m shortfall with many of its 15 districts walking a tightrope.*);
- literal-scene manipulation (e.g. *The Chancellor had a narrow tightrope to walk and he managed to please a variety of people*);
- topic indication, which differently from literal-scene manipulation does not represent a wordplay on the literal meaning of the phrase nor does it output a literally meaningful phrase, but it rather elaborates on its context-induced figurative sense (e.g. *That sum may seem like a lot of lei (the Romanian currency that purchases next to nothing abroad) but it still left the Romanians treading a financial tightrope, where *financial* refers to *tightrope*'s figurative meaning 'unstable basis / difficult situation')*);
- topic-related literal-scene manipulation, which, differently from literal-scene manipulation, does not modify the original idiomatic meaning (e.g. in *a narrow tightrope* the original meaning is intensified), but just creates a lexical variation that is in line with the context, as in Langlotz's (2006, p.212) example of Italian mafia gangsters disclosing secret information described as *spilling the pasta* instead of *spilling the beans*.

Depending on their frequency and distribution, these aforementioned variants can have the status of usual variants, like lexicalized alternations (e.g. *miss the*

boat/bus), systematic variants, as in the cases of constructional adaptation, variants created intentionally in order to bring about perlocutive effects in the interlocutor by playing on the literal-figurative meaning relationship, or can just be erroneous creations and slips of the tongue.

Another corpus-based study on idiomatic variability that also compares corpus data with human-elicited judgments is carried out by Wulff (2008), whose work is framed within the constructionist perspective (Langacker, 1987; Fillmore et al., 1988; Goldberg, 1995, 2006, 2019; Bybee, 2010; Hoffmann and Trousdale, 2013). The purpose of Wulff’s (2008) work is to bring evidence from complementary perspectives to demonstrate that idiomaticity is a gradient rather than a clear-cut property of expressions and that idioms are rather distributed along a continuum of compositionality and lexicogrammatical fixedness. The dataset employed by Wulff (2008) comprises 39 verb-determiner-NP constructions extracted from the BNC like *bear DET fruit*, *make DET headway* and *write DET letter*. In a rating task, subjects are presented with a list of these constructions used in a context and asked to give them an idiomaticity rating. Opaque idioms like *take DET plunge* and *foot DET bill* report the highest ratings, less opaque constructions labeled as ‘metaphors’ by Wulff (2008) report intermediate scores, as *see DET point* and *fight DET battle*, while literal expressions like *write DET letter* predictably report the lowest judgments. The author then presents a new compositionality index devised by building on Berry-Rogghe’s (1974) *R-value*, a compositionality score for verb-particle constructions (VPCs) that computes the ratio between the number of collocates that the VPC shares with the particle and the number of collocates of the VPC:

$$R = \frac{\text{no. of collocates of VPC shared with P}}{\text{no. of collocates of VPC}} \quad (1.1)$$

To exemplify this formula, Berry-Rogghe (1974) compares two VPCs like *live in* and *believe in*. While *live in* shares many collocates with its particle, like *hut*,

house, *town* and *country*, and is thus given a high compositionality score, none of the significant collocates of *believe in*, like *witchcraft*, *God*, *Jesus* and *devil*, are shared by the particle alone and the construction hence obtains a low compositionality score. Wulff (2008) extends this formula to calculate the compositionality of her V-NP constructions by computing the R-value for both the verb and the noun in each expression and multiplying each R-value by a *share* factor that weighs the contribution of each constituent. This factor is computed as the ratio between the number of collocates shared by the whole construction and the single verb or noun phrase component and the number of collocates of the component:

$$share_V = \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_V}{n \text{ colls}_V} \quad (1.2)$$

$$share_{NP} = \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_{NP}}{n \text{ colls}_{NP}} \quad (1.3)$$

Components that share a great deal of their collocates with the construction will therefore count more than constituents that share just a few of their collocates with the construction. A semantic contribution score is thus computed for both the verb and the noun phrase by multiplying the R-value by the share:

$$contribution_V = \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_V}{n \text{ colls}_{pattern}} \times \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_V}{n \text{ colls}_V} \quad (1.4)$$

$$contribution_{NP} = \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_{NP}}{n \text{ colls}_{pattern}} \times \frac{n \text{ colls}_{pattern} \text{ in } n \text{ colls}_{NP}}{n \text{ colls}_{NP}} \quad (1.5)$$

The contributions of the verb and the noun phrase are then summed to obtain an overall compositionality index. Among the lowest scoring constructions, Wulff (2008) finds idioms like *make X headway* and *take X plunge*, while the highest ranking constructions are predictably literal combinations like *tell X story* and *write X letter*.

To compute the formal flexibility of the V-NP constructions in the dataset,

Wulff (2008) focuses on three variational dimensions, namely tree-syntactic flexibility (e.g. variation in the type of sentence, like passives or interrogatives), lexicosyntactic flexibility (e.g. variation in the presence of adjectives and prepositional phrases modifying the idiom) and morphological flexibility of the verb and the determiner. As a first index, the author builds on Barkema’s (1994) formula which compares how frequently a formal variant is observed for an idiom with the frequency of the same variant for all the expressions having the same syntactic structure. To compute how flexible *foot DET bill* is according to the Tense parameter, for instance, Wulff (2008) observes that the past, present, future and nonfinite tenses occur 10, 45, 9 and 45 times in this idiom respectively. If tense frequency for this idiom were to be distributed as in verb-noun structures in general, the proportion would be 28, 68, 2 and 11. The difference between observed and expected frequencies for every value of the parameter is then computed, squared and added with the other squared differences. The higher the difference in the syntactic behavior with respect to the verb-noun structure baseline, the more idiosyncratic the construction. The mean sum of squared deviations computed for tree-syntactic flexibility shows that the constructions whose flexibility is most similar to verb-noun structures are literals or ambiguous idioms like *call_police*, *draw_line* and *write_letter*. On the other hand, constructions whose flexibility is the least similar to that of the baseline are idioms like *follow_suit*, *get_act_together* and *meet_eye*. Another measure proposed by Wulff (2008) is Shannon’s (1948) entropy, which measures the average degree of uncertainty in a random variable X :

$$H(X) = - \sum_{x \in X} p(x) \log_2(p(x)) \quad (1.6)$$

For each dimension of variation (e.g. verbal tense, presence/absence of intervening adjectives, etc.), the variable X is replaced with the construction at issue and each state of the system x stands for each of the possible values that the construction

can assume along that dimension (e.g. present, past or future tense; presence or absence of intervening adjectives). The higher the entropy, the more variable the construction along a specific syntactic or morphological dimension. Entropic values for tree-syntactic flexibility show that the most variable constructions are literals or ambiguous idioms like *call_police*, *cross_finger* and *draw_line*, while once again the most rigid ones are idioms like *get_act_together* and *meet_eye*.

In order to try to understand whether the parameters that most explain the variation of the corpus data are also taken into account by subjects to express their idiomaticity judgments, a multiple regression analysis is conducted with the speaker-elicited ratings as a dependent variable and the corpus parameters as predictors. A comparison of predictors' absolute beta weights reveals that the predictors explaining most of the judgments' variance are tree-syntactic flexibility (i.e. sentence type), lexico-syntactic flexibility (e.g. the occurrence of intervening adverbs in an expression) and compositionality, together with verbal morphology. Quite surprisingly, compositionality does not receive the most important place in detecting idiomaticity, though it is the most importance property of idiomaticity that is usually highlighted in theoretical studies. All in all, this comparison between corpus and experimental evidence confirms that idiomaticity is a multifactorial and scalar concept and that compositionality and syntactic flexibility are just some of its manifold aspects. To account for the heterogeneity of idioms, Wulff (2008) puts forth a modified version of the Constructicon, where an additional idiomaticity axis is orthogonal with respect to the axis of lexical specification and schematicity and is in turn composed of a number of layers, each one representing a specific variation parameter for each construction, like verbal number, verbal mood, presence of adverbials and the like. The values obtained for each layer contribute to the overall idiomaticity of the construction. In addition, the more idiomatic a construction, the less linked with the representation of its component words it is and viceversa. Since, for instance, *take DET plunge* is a

highly idiomatic construction, it will be weakly connected to the representations of *take* and *plunge*. By the same token, *write DET letter* is very low in idiomaticity value and will therefore be connected not only with the representations of *write* and *letter*, but also with other related items, like *type*, *compose* and *paper*.

Vo (2011) proposes a pragmatic model of idiomatic creativity combining both quantitative and qualitative analyses on the Michigan Corpus of Academic Spoken English (MICASE), the Cambridge and Nottingham Corpus of Discourse in English (CANCODE) and the BNC. Corpus query tools are used to detect the formal variants of a set of 100 idioms. The quantitative correlation between idiomatic creativity and idiom internal semantics is then explored, focusing in particular on three semantic features that are usually regarded as determinants of idiomatic creativity in the literature (Gibbs and Nayak, 1989; Gibbs et al., 1989a; Nunberg et al., 1994):

- *semantic analyzability* or *decomposability*, namely the isomorphic correspondence between parts of the idiom and parts of its idiomatic reference already studied by Nunberg et al. (1994);
- *literal well-formedness*, which can be violated by syntactic anomalies (e.g. *by and large*, *trip the light fantastic*), semantic anomalies like the presence of cranberry morphs, archaic words or words that never occur outside of the idiom (e.g. *spick and span*, *go haywire*) or selectional preference violation (e.g. *crack a joke*, *swallow one's pride*), and also pragmatic anomalies like in *lose it* or *bite the bullet* where the reference of *it* is unexplained or *the bullet* has always a definite determiner despite not being previously mentioned in the discourse;
- *motivation*, as discussed by Langlotz (2006).

While literal well-formedness and motivation are found to significantly correlate with creativity, analyzability does not seem to have a significant effect. Motivated and well-formed idioms tend also to appear with a wider range of variant types than unmotivated and ill-formed idioms. Considering that semantic features apparently do not fully predict idiomatic creativity, especially in the case of context-specific wordplay and puns, in the second part of her work Vo (2011) resorts to a rich pool of corpus and internet data to embark on a qualitative re-examination of idiom variants to account for individual features and exceptions. First of all, while analyzability, well-formedness and motivation serve as facilitating factors in idiomatic creativity, Vo (2011) argues that cognitive constraining factors that regulate the phenomenon are grammaticality, compatibility, recognizability and functionality. In other words, an idiom variant has to comply with the grammatical rules of the target language, to be semantically compatible with the figurative meaning of the canonical idiom, to be easily recognized as the idiom at issue and finally it has to serve a precise and discernible purpose in the communicative event where it is used. The role of semantic transparency and cognitive constraints does not appear to be influential in the case of context-dependent variants, namely those substitutions or formal modification that could not be understood outside of their context. Let us consider these two examples reported by Vo (2011):

(29) Can Jobs think outside the pretty box?

(30) It's raining cats, dogs and lizards too.

These two variants cannot be properly understood if a very specific context is not provided. In the first case the proverbial *box* is described as *pretty* in reference to Steve Jobs' aesthetic philosophy, which was often criticized to put style before substance. The second example found by the author actually refers to a pet

competition for children, where a great deal of different animals are exhibited. In these context-dependent variations, the facilitating role of context is shown to be so strong that it overrides other facilitating and constraining factors and can make even opaque varied idioms recognizable and functional. Semantic features turn out to be more influential determinants in the case of context-independent variants, which are understood via inferential processes once the figurative meaning of the idiom has been activated without any need for a contextual support:

(31) You're striking while the iron is cold.

(32) Striking while the iron is lukewarm is sometimes the best strategy in philosophy.

If a speaker is familiar with the meaning of the canonical idiom *strike while the iron is hot*, that is 'to act immediately while a situation is favorable', they will be able to assign an individual figurative meaning of 'promptness' to the component *hot*. The two examples can then be made sense of by thinking of the graded semantic relationship between the literal meanings of *hot*, *lukewarm* and *cold* and transferring such gradualness to the concept of promptness, so that the first example will refer to a bad-timing situation and the second one to a situation where the subject acts after some time from the opportune moment has gone by. Quite importantly, the intervention of contextual elements is not necessary anymore to figure out the semantics of these modified idiom tokens. All in all, Vo's (2011) pragmatic account depicts idiomatic creativity as a multifaceted phenomenon affected by different factors in varying degrees, namely semantic facilitating features, cognitive constraints and context.

The same variational patterns outlined by Langlotz (2006) are also tracked down by Duffley (2013) in his web-based analysis of two non-compositional idioms, namely *kick the bucket* and *shoot the breeze*. The fact that even these expressions

can undergo constructional adaptation (e.g. *Most of the breeze was being shot by one sloppy looking veteran driver*), literal-scene manipulation (e.g. *just shoot the afternoon breeze*) and so forth clearly shows that formal plasticity can be traced in non-compositional idioms as well (contra e.g. Gibbs and Nayak, 1989 and Nunberg et al., 1994). An additional variational strategy is also detected by Duffley (2013), namely poetic or extravagant manipulation, which basically boils down to a speaker altering the form of an idiom just for the sake of a wordplay (e.g. *my phone kicked the pail last week*).

Schröder's (2013) corpus analysis of the syntactic flexibility of nine idioms on the BNC and the Corpus of Contemporary American English (COCA) calls into question Horn's (2003) classification of idioms into fixed idioms, mobile idioms and metaphors. Fixed idioms like *kick the bucket* and *bite the dust* are expected to be formally frozen, but in fact are shown to undergo adjectival insertion (e.g. *bit the desert dust*) and passivization (e.g. *the nettle was grasped*). Mobile idioms like *spill the beans* or *break the ice* are predicted to be susceptible to certain kinds of modification like passivization or raising, but actually show to undergo other transformations as well like adjectival insertion (e.g. *spill the many-flavoured beans*). Finally, metaphors like *make headway* should allow an unlimited range of possible manipulations but actually appear to occur with adjective insertion (e.g. *make some headway*) the most.

Torre (2014) builds on Langlotz's (2006) framework to elaborate a web corpus-based analysis of the socio-cognitive status of Italian idioms and of their variation pattern. Instead of sticking to a strictly cognitive approach, he adheres to a more distributed and ecological framework by also incorporating elements of dynamical systems theory. In his perspective, idiomatic language, like language in general, displays a self-organizing structure, which causes the emergence of a series of attractor states. These attractor states, also called *idiomatic clusters*, are made

up by the conventional meaning of the idiomatic expression and by the preferential lexico-grammatical features with which the expression occurs most often. While the occurrences of the idiom tend to converge to the idiomatic cluster, at the same time they are also affected by numerous variables brought into play by the specific contexts of use. A single token of the idiom may thus deviate to some extent from the attractor state, contributing to reshaping the idiomatic cluster. In Torre's (2014) account, not only are the various token occurrences of a given idiom connected to their idiomatic cluster, but idiomatic clusters are also linked to one another, especially in the case of idioms sharing a similar form or meaning. Therefore, this reshaping process alters a single idiom, but it also affects the whole network of Italian idioms. Of note, this dynamical system purview also takes into account the diachronic evolution of constructions, since an attractor state also represents the status of the expression at a specific time and plays a constraining function in the future developments of the system.

Vietri's (2014) web-based investigation of Italian idiom syntax follows the Lexicon-Grammar methodology proposed by Gross (1994), whereby simple sentences (subject-verb-objects) are considered as the elementary units of analysis in a language instead of single words and constitute single dictionary entries described by their corresponding distributional and transformational properties. These properties are coded via binary matrices, where the rows are the single sentences, the dimensions are the various semantic or syntactic features (e.g. the presence/absence of a human subject, the presence of nominalization or passivization, etc.) and the matrix values are binary options indicating the presence or absence of a specific trait for each sentence. A wide range of syntactic transformations are retrieved from the web query, as passivization with preverbal (33) and postverbal subjects (34), *si*-impersonal passives (35), reduced passives (36), left-dislocation (37) and modification (38):

- (33) Di lì in poi, le tappe furono bruciate in fretta.
 ‘From that point on, things went fast (lit. the stages were burnt)’.
- (34) Si dà il caso che l’unico a cui sono state rotte le scatole per la compilazione del calendario è il sottoscritto.
 ‘It seems that I am the only one being hassled (lit. to whom are been broken the boxes) about compiling the agenda’.
- (35) Il 2009 sarà durissimo, con queste pensioni non si sbarca il lunario.
 ‘2009 will be tough, because with these pensions people won’t be able to make ends meet (lit. the almanac is not passed)’.
- (36) Se non sbaglio poi proprio quella sera lì si seppe delle cuoia tirate da Joe Cassano.
 ‘If I’m not mistaken, that very evening people knew about the death of Joe Cassano (lit. the skins pulled by Joe Cassano)’.
- (37) Mia figlia non è stupida e sicuramente la foglia l’ha mangiata.
 ‘My daughter is not stupid and certainly she smelled a rat (lit. the leaf it has eaten)’.
- (38) Compatito e sbeffeggiato da tempo immemore, questo tipo di funzionario dello Stato sbarca un lunario misero.
 ‘Sometimes sympathized and other times mocked, this public officer barely manages to make ends meet (lit. pass an almanac miserable)’.

Analyzing all these instances of syntactic manipulation, Vietri (2014) concludes that both idiomatic and non-idiomatic constructions are subject to the same syntactic rules, and that the low frequency of certain idiom syntactic variants must not be mistaken for a sign of ungrammaticality or unacceptability. Moreover, she

finds that also idioms that would be traditionally labeled as opaque (e.g. *tirare le cuoia* ‘to kick the bucket’ lit. ‘to pull the leathers’, *rompere le scatole* ‘to get on someone’s nerves’ lit. ‘to smash up the boxes to someone’) can be subject to syntactic transformations like the passive one, which are usually considered a prerogative of decomposable idioms only. Therefore, if an apt context is provided, idioms can be as flexible as literal language and semantic decomposability does not always seem to be a constraining factor. Certain idioms containing verbs like *fare* ‘to do, to make’ and *avere* ‘to have’ do not tolerate passivization as in (40), but, as the authors observe, the same resistance to passivization is exhibited by the verb themselves even when used in less idiomatic contexts (42):

(39) Gianni fa il finto tonto.
‘Gianni plays dumb (lit. makes the false idiot)’.

(40) *Il finto tonto viene fatto da Gianni.
Lit. ‘the false idiot is made by Gianni’.

(41) Max fa l’avvocato.
‘Max is a lawyer (lit. makes the lawyer)’.

(42) *L’avvocato è fatto da Gianni.
Lit. ‘the lawyer is made by Max’.

Vietri (2014) goes on to point out that the low frequency exhibited by some variants like passivization actually mirrors the fact that passive forms are low-frequency per se as Pullum (2014) claims in the case of English, where a large body of works on grammar, style and usage strongly advises against the use of passive forms.

In a previous contribution (Lebani et al., 2015), we test the cognitive plausibility of entropic indices of formal flexibility as in Wulff (2008) and distributional

semantic indices of compositionality on a set of 87 Italian verbal idioms taken from Tabossi et al.'s (2011) norms. Tabossi et al. (2011) elicit normative judgments on a set of 245 Italian idioms from 740 native speakers. Rated variables include predictability, literality and acceptability of syntactic variants (adverb insertion, adjective insertion, left dislocation, passivization and movement). After extracting our 87 idioms from La Repubblica (330M tokens; Baroni et al. 2004), we use Shannon entropy (Equation 1.6) as in Wulff (2008) to compute a series of distinct variability scores, like lexical variability of the noun slot, variability in noun morphology, variability in verb morphology, variability in the presence of intervening adjectives and variability in the word order. In the case of the idiom *gettare un'ombra su* 'to cast a shadow on', for instance, possible states for the lexical variability entropy are all the noun lemmas that may occur in the prepositional phrase noun slot, as in *gettare un'ombra sul mistero* 'to cast a shadow on the mystery' or *gettare un'ombra sull'affare* 'to cast a shadow on the deal'. To provide another example, possible states for the noun morphology entropy are *gettare un'ombra* (singular noun) and *gettare delle ombre* 'to cast some shadows' (plural noun). The distributional score we use measures the average cosine similarity between the vector of an idiom taken as a unique token and the vector of each component. Aside from showing that a dataset that is entirely composed of idioms exhibits a considerable internal variability in the degree of flexibility and compositionality of the expressions, we also prove that our entropic and distributional indices, together with frequency, can successfully predict normative judgments of predictability, literality and syntactic flexibility.

Finally, Dabrowska's (2018) book-length contribution focuses on the syntactic behavior English idioms conveying emotional, mental or psychological conditions of varying syntactic structures, like *carry a torch*, *paint the town red* and *give someone a hard time*, using both the COCA corpus and Google queries to extract usage data. She first adopts Nunberg et al.'s (1994) distinction between idiomatic

phrases and idiomatically combining expressions and confirms that a wide range of syntactic phenomena, as quantification, topicalization, ellipsis, anaphoric reference as well as lexical replacement mostly occur with the latter class of idioms. Second, the difference between the two classes of idioms is analyzed within the scope of the minimalist Phase theory (Svenonius, 2005; Harley and Stone, 2013). In this regard, while nondecomposable idiomatic phrases are said to be confined to the clause-internal phase and to have the *v*P-phase as upper bound, idiomatically combining expressions are described as able to straddle phase boundaries and to depend on material which is located beyond the phase level.

To sum up, computational studies on automatic idiom identification (Section 1.5.1) show that taking advantage of idiom-defining properties like lexical fixedness (Lin, 1999; Fazly et al., 2009), syntactic fixedness (Bannard, 2007; Villavicencio et al., 2007; Ramisch et al., 2008a; Fazly et al., 2009) and restricted compositionality (Baldwin et al., 2003; Venkatapathy and Joshi, 2005; Fazly and Stevenson, 2008; Krčmář et al., 2013) is an effective strategy to devise compositionality indices that successfully classify expressions as idiomatic or non-idiomatic. The effectiveness and high accuracy of these approaches reveals that all in all idioms tend to be more formally rigid than compositional expressions in language use and that formal flexibility can hence be leveraged as a discriminating factor. Despite this general tendency towards lexicosyntactic conservatism, other qualitative and quantitative corpus studies anyway suggest that, given an appropriate context, various lexical and syntactic phenomena can be traced in idiom usage in corpora, like polarity reversal, passivization, pronominalization, relativization and lexical variation (Moon, 1998). While a general coincidence between formally flexible idioms and semantically decomposable or transparent idioms is usually observed (Nunberg et al., 1994; Langlotz, 2006; Vo, 2011; Dabrowska, 2018), other contributions (Duffley, 2013; Schröder, 2013; Vietri, 2014) show that transformability can be allowed even by opaque idioms. In any case, such variability does not appear to

be unlimited and casual, but it rather sticks to specific communicative needs and cognitive constraints. Langlotz (2006) highlights how idiomatic creativity is indeed motivated by the need to adapt the context-independent meaning and formal configuration of an idioms to a specific communicative context by playing on the literal and/or figurative meaning conveyed by an idiomatic string. On top of that, Vo (2011) claims that idiom variability has to obey specific cognitive constraints, like grammaticality, recognizability and functionality. Finally, other quantitative works on idiomatic variability use entropic indices of lexicosyntactic fixedness and distributional indices of compositionality to computationally explore the continuum of formal and semantic idiosyncrasy that exists within idioms themselves and also demonstrate that these computational indices can effectively predict how speakers perceive the idiomaticity and the syntactic manipulability of the same expressions (Wulff, 2008; Lebani et al., 2015).

Chapter 2

Lexical flexibility as a clue to compositionality: a distributional-semantic approach

2.1 Introduction

As already touched upon in Chapter 1, one of the defining features of multiwordness that helps framing a given word combination as typical and having lexical status is restricted lexical versatility (Sinclair, 1991; Sag et al., 2002; Cacciari, 2014; Siyanova-Chanturia and Martinez, 2014). The discriminating role that flexibility in lexical choice has in distinguishing multiword units from *ex-novo* compositional word combinations has particularly been stressed in phraseological and formulaic approaches to the lexicon and the grammar (Cowie, 1998; Wray and Perkins, 2000; Wray, 2008; Masini, 2012; Mel'čuk, 2012). Sinclair's (1991) trailblazing analyses in corpus-driven lexicography led him to posit an *idiom principle* at the root of human linguistic behavior, whereby speakers would mostly go for (semi-)preconstructed phrases in production rather than opting for an *open-choice*

principle and preferring *ex-novo* combinatorial expressions. This prefabricated nature and transformational recalcitrance seems anyway to characterize the various kinds of multiword units that exist to different extents. Starting off from the case of conversational routines and collocations, at least if we stick to a statistical and empirical definition of collocability (Firth, 1957; Manning and Schütze, 1999; Evert, 2008), the violation of this supposed frozenness most of the time does not result in the impossibility to grasp the original meaning of the expression in a compositional bottom-up fashion, but it rather sounds odd and not native-like (e.g. *spend a nice day* and *strong rain* in place of *have a nice day* and *heavy rain*; Pawley and Syder; Siyanova-Chanturia and Martinez 2014). Moving on to idioms, their non-compositional nature poses restrictions, as we saw in Chapter 1, on *salva-veritate* interchangeability (Frege, 1892) and systematicity (Cummins, 1996; Fodor and Lepore, 2002; Szab, 2017). Stepping outside of a purely theoretical ground, psycholinguistic and corpus-based studies have actually found idioms to exhibit considerable lexical variation (Gibbs et al., 1989a; McGlone et al., 1994; Moon, 1998; Glucksberg, 2001; Riehemann, 2001; Grant, 2005; Langlotz, 2006; Vo, 2011; Duffley, 2013; Torre, 2014). Specifically, psycholinguistic research on the comprehension of idiom lexical variants has found these alternatives to be more acceptable when the idiom components make an independent contribution to the overall figurative meaning of the phrase (Gibbs et al., 1989a): an idiomatic reading for *go out on a branch* (from *go out on a limb*), for instance, turns out to be judged by speakers as more acceptable than an idiomatic reading for *punt the pail* (from *kick the bucket*). Another factor that is found to ease the processing of such variants is familiarity of the speakers with the original idiom (McGlone et al., 1994; Geeraert et al., 2017a). Anyway, while contributions of this kind are useful to assess whether potentially occurring variants can be understood by speakers or not, it is looking at corpus analyses that we can gain an insight into the actual occurrence of such lexical alternatives in real text. Moon (1998) and Duffley (2013)

have found all kinds of idioms to be used sometimes in an altered form with the idiomatic reading preserved, regardless of their semantic analyzability and motivation (e.g. even *kick the pail* and *kick the can* for the opaque *kick the bucket* can be found), with Moon (1998) positing the existence of *idiom schemas* that subsume alternative lexical realizations of idiomatic strings like *shake/quake/quiver in one's shoes/boots* or *down the chute/drain/pan* that anyway share all the same meanings. Rather than representing separate idioms, these lexically alternating forms are actually conceived of as clusters that share the same underlying metaphor or metonymy and embody salient concepts in the speakers' culture (Moon, 1998; Gibbs, 2007). Nonetheless, this kind of lexical flexibility does not turn out to be so widespread, systematic and predictable as in non-idiomatic constructions, therefore making limited lexical versatility a viable clue for spotting idioms in corpora (Lin, 1999; Fazly and Stevenson, 2008; Fazly et al., 2009).

As we will outline in the next Section, previous computational research has taken advantage of the restricted formal variability exhibited by idioms to devise indices that automatically separate them from more literal combinations. Some algorithms have compared the different collocational association between the canonical form of an expression and the lexical variants of that construction obtained by replacing its parts with semantically related words (Lin, 1999; Fazly et al., 2009). Others have exploited the difference in cosine similarity between an entire phrase and its components that is observed in idioms and non-idioms in Distributional Semantics Models (Baldwin et al., 2003; Venkatapathy and Joshi, 2005; Fazly and Stevenson, 2008; Krčmář et al., 2013). Here, we combined insights from both the aforementioned approaches, using the generation of lexical variants as the departure point for a distributional semantic analysis. In the first experiments we will present in Section 2.3, such variants were generated from a set of target Italian V-NP and V-PP constructions, including both idioms and non-idioms, but instead of measuring differences in the association scores between a given target and its

variants, we computed the cosine similarities between them. All in all, idiomatic expressions were expected to result as less similar to their lexical variants with respect to non-idiomatic ones. To provide an example, the similarity between the vector of an idiom like *dare i numeri* ‘to lose it’ (lit. ‘to give the numbers’) and the vectors of its variants *offrire i numeri* ‘to offer the numbers’ and *dare le unità* ‘to give the units’ was predicted to be lower than the similarity between the vector of a non-idiom like *leggere un libro* ‘to read a book’ and its variants like *sfogliare un libro* ‘to leaf through a book’ and *leggere uno scritto* ‘to read a work’. The rationale behind combining the two strategies is that sticking to a purely association-based measure (Church and Hanks, 1991; Lin, 1999; Fazly et al., 2009) could end up including also those compositional expressions that nonetheless display collocational behavior and constitute a preferential co-occurrence pattern with low lexical versatility (e.g. *drive a car* or *brush one’s teeth*; see Firth 1957 and Evert 2008). As Bannard et al. (2003) put it, Lin’s (1999) method seems actually more tailored to capture phrase institutionalization rather than non-compositionality per se. Comparing the distributional context of an original phrase with those of its variants would therefore guarantee that only those expressions for which lexical substitution results in utter semantic change or is not even possible are retrieved. On the other hand, relying just on the comparison between the distributional context of a phrase as a whole and the distributional contexts of the component words of the phrase to infer compositionality (Baldwin et al., 2003; Venkatapathy and Joshi, 2005; Fazly and Stevenson, 2008; Krčmář et al., 2013) could run the risk of not being generalizable to idioms containing obsolete words that never occur outside of those expressions, as in the case of *repentaglio* ‘risk’ that only occurs in *mettere a repentaglio* ‘to put at risk’ or the old plural *cuoia* ‘leathers’ that only occurs in *tirare le cuoia* ‘to kick the bucket’ (lit. ‘to pull the leathers’). In Section 2.6, we will show that this approach can be generalized to expressions of different syntactic structures, by successfully applying it to a set of idiomatic and non-idiomatic

2.2 Related work

Crucially for the experiments we will report on in this chapter, previous studies have dealt with lexical flexibility as a bellwether of (non-)compositionality in corpora to carry out multiword expression (MWE) identification. The approach by Tapanainen et al. (1998), for instance, draws on the principle of semantic asymmetry in verb-object relations (Keenan, 1978), whereby it is argument categories that affect the semantic interpretation of functor categories and therefore it is the object to select the meaning of the transitive verb. In compositional instances of this semantic tailoring (Allerton, 1982), the object selects one of the verb subsenses (e.g. *cut* in *cut a cake* means ‘to divide into portions’ while in *cut a lawn* it means ‘to trim’), while in more idiomatic ones the object forms a language-specific and unpredictable combination with the verb, which often becomes semantically dummy (e.g. *take* in *take a toll*). Following this reasoning, since it is the object to mainly determine the semantics of a verb-noun combination, the distributed frequency of a noun as an object ($DF(o)$) is seen as a proxy of its idiomatic nature. Given an object o and triples like $\langle F_1, V_1, o \rangle, \dots, \langle F_n, V_n, o \rangle$ that indicate the frequency F_j of o as an object of the verb V_j , distributed frequency is computed with the following formula, where nouns that occur as objects with just one verb or a few verbs will receive a higher score and therefore a higher idiomatic status:

$$DF(o) = \sum_{k=1}^n \frac{F_k}{n}$$

While the method put forth by Tapanainen et al. (1998) *de facto* takes into account just the flexibility of the verbal slot, the intuition behind Lin’s (1999) work is to generate lexical variants of a given combination by replacing both the verb and

the noun slot with semantically related words extracted from a thesaurus (Lin, 1998). Thus, starting from the verb-noun (VN henceforth) combination *spill gut*, variants like *leak gut* and *pour gut*, with verb replacement, and other variants like *spill intestine* and *spill instinct*, with noun replacement, are generated. A given combination is then labeled as non-compositional if it has no variants attested in the corpus or if there is no overlap between the 95% confidence intervals of the mutual information values of the combination and of its variant(s). Given a triplet (*head type modifier*), its mutual information (MI) is computed as follows:

$$MI(\textit{head type modifier}) = \log\left(\frac{|\textit{head type modifier}| * |\textit{type}|}{|\textit{head type}| * |\textit{modifier}|}\right)$$

In Lin’s (1999) approach, the requirement for non-compositionality is thus that the MI of a target construction be significantly different from the MI of all its variants. Pearce (2001) proposes a multiword extraction method based on lexical non-substitutability that compares the frequencies of an original two-word combination extracted from parsed dependencies with that of its lexical variants. *Emotional baggage* and *in my opinion* are then labeled as multiwords since their variants like *emotional luggage* and *in my point of view* almost never occur on the web or are extremely rare. Synonyms for the target combinations are taken from WordNet (Miller, 1995; Fellbaum, 1998) synsets. Such lexically altered forms that lead to unnatural readings are called *anti-collocations*. In their study on VN constructions, Fazly et al. (2009) further elaborate on Lin’s 1999 idea by devising a lexical fixedness index that computes the deviation between the Pointwise Mutual Information (PMI) of a target expression and the mean PMIs of its variants, normalized using the standard deviation s of the sample:

$$Fixedness_{lex}(v, n) = \frac{PMI(v, n) - \overline{PMI}}{s}$$

In the above formula, v and n are the verb and the noun of the target combination, while \overline{PMI} is the mean PMI of its variants, obtained via Lin’s (1998) thesaurus:

$$\{PMI(v_r, n_t) \mid \langle v_r, n_t \rangle \in \langle v_r, n_t \rangle \cup S_{sim(v,n)}\}$$

$S_{sim(v,n)}$ in the formula stands for the set of variants, composed of the K_v most similar verbs to v and the K_n most similar nouns to n :

$$S_{sim(v,n)} = \{\langle v_i, n \rangle \mid 1 \leq i \leq K_v\} \cup \{\langle v, n_j \rangle \mid 1 \leq j \leq K_n\}$$

In a previous study (Fazly and Stevenson, 2006), only the noun constituent is replaced, expecting that verbal modification could result in another related idiomatic expression (e.g. *keep/lose one’s cool*), but the authors eventually find out that substituting both components leads to a better performance. Actually, comparing the PMI of the target with the mean PMIs of its variants brings also the further advantage of accounting for those idioms that might have a very frequent variant (e.g. *crack the ice* for *break the ice*) but are all in all very different from their variants. Ramisch et al. (2008b) make use of a substitution-based method to determine verb-particle construction compositionality. Substitutions are created by replacing the original verbs with synonyms extracted from WordNet (Miller, 1995; Fellbaum, 1998) or taken from the same Levin (1993) class. Shannon (1948) entropy is then used to measure how uniform the probability distribution of variants for a given verb-particle construction is:

$$H(V) = - \sum_{i=1}^n p(v_i) \ln[p(v_i)]$$

In the above formula, $p(v_i)$ stands for the probability of the i -th variant in the corpus among all the set of possible variants V . The less uniform the variant distribution, the more idiomatic the verb-particle construction, since it will mostly

occur in one fixed form. Other works have made use of distributional spaces to generate lexical variants and anti-collocations. Farahmand and Henderson (2016), for instance, devise a non-substitutability-based method to detect noun compounds that compares the conditional probability between the constituents of a compound to the conditional probability between the components of a lexical alternative of the same compound:

$$P(w_2|w_1) > P(w_2|sim(w_1))$$

In this formula, w_1 and w_2 are the two subwords of a compound, while $sim(w_1)$ is the set of words that are semantically similar to w_1 . In Farahmand and Henderson’s 2016 work, conditional probability is also applied in the other direction. Both probabilities are estimated by means of a log-linear model. The authors point out that resorting to a knowledge base like WordNet brings on a coverage problem, beside the labor-intensiveness required to continuously update the database. Since computing similarity within a word embedding space is known to be a reliable way to approximate synonymy (Chen et al., 2013; Lenci, 2018), synonyms in this study are thus extracted distributionally.

Another group of studies has focused on comparing the distributional behavior of a given word combination as a whole with that of its component words to perform idiom type detection. While McCarthy et al. (2003) make use of thesaurus-based measures to compute the overlap between the neighbors of a phrasal verb and those of its simplex verb, Baldwin et al. (2003) and Reddy et al. (2011) employ word space models (Landauer and Dumais, 1997; Sahlgren, 2006) to measure the cosine distance between the vector of a phrasal verb or a noun-noun compound and the vectors of their component words. The criterion in this approach is that since *help out* is quite compositional, it should share more neighbors with *help* compared to the neighbors that *catch up* shares with *catch*. Reddy et al. (2011) make also use of component-wise vector addition and multiplication (Mitchell and

Lapata, 2010) to model compound noun compositionality and show them to predict human compositionality ratings better than computational scores based on the semantics of the single components. In a similar fashion, Krčmář et al. (2013) present a systematic review and comparison of a variety of DSM-based compositionality measures for subject-verb, verb-object, adjective-noun and noun-noun combinations. These measures encompass substitutability-based ones, that compare the frequency of a word combination to that of its lexical variants, endocentric ones, consisting of whole-to-component distributional similarities, compositional ones, namely the similarity between the vector of a combination taken as a whole and the sum or product vectors of its components, and neighbors-in-common-based ones, that compare the nearest neighbors of a combination with those of its constituents. Of note, distributional indices have also been used by Katz and Giesbrecht (2006) and Sporleder and Li (2009) to perform idiom token detection and spot out idiomatic usages of word combinations in context.

Most importantly for the present work, other contributions have taken advantage of both distributional compositionality scores and association-based lexical flexibility measures at once to spot idioms in corpora. Venkatapathy and Joshi (2005) combine the flexibility indices proposed by Lin (1999) and Tapanainen et al. (1998) and LSA-based (Landauer and Dumais, 1997) scores, together with other features, by means of a SVM based ranking function to rank the V-N collocations according to their compositionality. Fazly and Stevenson (2008) resort to a decision tree induction system to automatically classify verb-noun expressions into literals (e.g. *give a book*), combinations implying an abstract transfer (e.g. *give confidence*), light verb constructions (e.g. *give a groan*) and idioms (e.g. *give a whirl*). The features used for the classification task include, among the rest, the lexical fixedness formula presented in Fazly et al. (2009), and distributional indices of compositionality that compute the cosine similarity between the verb+noun sum vector with the noun vector, with the verb vector and with the

vector of a verb morphologically related to the noun to grasp the compositionality of light verb constructions (e.g. in the third case, cosine similarity was calculated between *pay attention* and *attend*). In a similar fashion to our approach, Bannard et al. (2003) tackle verb-particle construction (VPC) compositionality by comparing substitutability indices *à la* Lin (1999) on the one hand and distributional scores on the other with a hybrid method that measures the distributional similarity between a target VPC and word-substituted lexical alternatives of the same VPC. Differently from our continuous scores (see Section 2.4.1), their classification is binary: a VPC is judged to be compositional if a lexical variant occurs among the nearest 100 VPCs to the original; otherwise, it is labeled as non-compositional. As they point out, this method elaborates on Lin’s 1999 one, which appears to be more sensitive to institutionalization rather than non-compositionality per se. While multiwords like *frying pan* are rather fixed in their lexical choice, they convey a quite compositional meaning. Comparing the distributional context of an expression to the context of its varied forms allows for leaving aside the assumption that substituted forms might have a similar distributional behavior to the original expressions (e.g. *frying pan* and *cooking pan*), since both institutionalized and non-compositional sequences are expected to undergo a meaning shift after lexical replacement.

2.3 Variant-based indices of VN phrase compositionality

In the present work we propose a method for idiom type classification that combines lexical variant generation with distributional semantics. The focus of the experiments described in this chapter is therefore to understand whether one of the main features of idiomaticity, i.e. lexical rigidity, is a reliable clue for carrying

out automatic idiom vs non-idiom classification in corpora, although we have seen that some degree of formal flexibility is actually possible in actual idiom usage. In Chapter 3, our perspective will shift from corpus usage to the mind of the speaker, to study how formal variants of idioms (passive forms specifically) are cognitively processed and how context and other idiom-related variables interact in modulating this processing. To perform idiom identification, we start from a set of V-NP and V-PP idiomatic and non-idiomatic constructions, generate a series of lexical variants for each expression by replacing the verb and the argument with semantically related words and then compare the semantic similarity between the initial constructions and their respective variants. For the sake of clarity, henceforth we will refer to the initial idiomatic and non-idiomatic expressions as *target* expressions, while the lexical alternatives that are generated for each target will be simply called *variants*. Since idiomatic expressions are supposed to exhibit a greater degree of non-compositionality and lexical fixedness than non-idiomatic ones, with the substitution of their component words resulting in the impossibility of an idiomatic reading (e.g. *spill the beans* vs. *spill the peas*), we expected them to be less similar to their variants with respect to more literal constructions. Starting from the assumption that we can study the semantics of a given word or expression by inspecting the linguistic contexts in which it occurs (Harris, 1954; Firth, 1957; Sahlgren, 2008), Distributional Semantic Models (DSMs) provide a viable solution for representing the content of our target and variant constructions with vectors encoding their distributional association with linguistic contexts (Turney and Pantel, 2010; Lenci, 2018). The semantic similarity between a given target and its variants is therefore implemented as the cosine similarity between them. Similarly to Lin (1999) and Fazly et al. (2009), we used lexical variants for each target expression, but instead of contrasting their association scores, we used vector-based measures to grasp their degree of semantic compositionality. Our approach is similar to the one proposed by Bannard et al. (2003) for VPCs, although

we frame some fundamental aspects differently. First off, we deal with idiomatic expressions, that constitute a rather heterogeneous class, distributed along a continuum of semantic transparency and formal fixedness. While most idioms do not tolerate lexical substitution in any case, others allow for semantic productivity in specific contexts (e.g. *shatter the ice*; McGlone et al. 1994) or can be clustered in *idiom schemas* (Moon, 1998) where the same idiomatic meaning can be conveyed through a restricted set of varying lexemes (e.g. *miss the boat/bus*). Given this heterogeneity of the idiom class, it felt more logical to us to frame idiom identification as a ranking problem rather than a binary task as in Bannard et al. (2003). Moreover, as we will explain in more detail in Section 2.5.1, in some versions of our algorithm we will also take into account the number of variants of a given construction that are *not* retrieved in the corpus (*zero variants* henceforth). In computational terms, such zero variants will be operationalized as the distributionally most distant vectors from the vector of a target, as though altering the lexemes of the target resulted in the greatest possible meaning shift. In our reasoning, such non-occurring evidence can be regarded as an additional proof of the non-compositionality of a given phrase. In our experiments, we will also compare models where variants are generated distributionally with models where variants are taken from a lexical resource as the Italian section of MultiWordnet (iMWN henceforth; Pianta et al. 2002) and we will also experiment with different ways of computing the distributional similarity between the target vectors and the variant vectors.

2.3.1 Extraction of the target and variant constructions

45 Italian V-NP and V-PP idioms were selected from an Italian idiom dictionary (Quartu, 1993) and extracted from the itWaC corpus (Baroni et al., 2009), which totalizes about 1,909M tokens. Their corpus frequency spanned from 364 tokens

(*ingannare il tempo* ‘to while away the time’) to 8294 tokens (*andare in giro* ‘to get about’). A set of 45 non-idioms (e.g. *leggere un libro* ‘to read a book’, *uscire da una stanza* ‘to get out of a room’) of comparable frequencies were then extracted from the corpus, ending up with 90 target constructions. For the selection of the non-idiomatic constructions, we referred to LexIt, an online resource that explores the distributional profiles of Italian nouns, verbs and adjectives in corpora (Lenci et al., 2012). The complete list of target VN idiomatic and non-idiomatic phrases, together with their itWaC frequency, is reported in Table A.1 in the Appendix. Crucially, in order to be as cautious as possible with linguistic definitions, we framed our idiom classification task in terms of distinguishing idioms from everything that is not an idiom (non-idioms) rather than speaking of idioms vs literals distinction, since it is not always straightforward and clear-cut to label a given construction as a fully literal one. We have already stated that compositionality is not a black-or-white feature and that constructions rather appear to be spread on a continuum of compositionality (Fazly and Stevenson, 2008; Cacciari, 2014). Diametrically opposed to pure idioms, i.e. purely non-compositional phrases, like *andare a genio* ‘to be to someone’s liking’ (lit. ‘to go as genius’), we can find fully compositional phrases like *leggere un libro* ‘to read a book’ and expressions like *chiudere l’anno* ‘to close the year’, which is no doubt quite compositional but still contains the verb *chiudere* ‘to close’ used in a slightly figurative and not purely literal way. We therefore opted for the broader *non-idiom* label to refer to the second group of expressions, so as to account for small differences in compositionality that nonetheless differentiate them from totally non-compositional idioms.

Two different methods were explored for generating lexical variants from our targets, namely distributional semantics and a manual synonym selection from the Italian section of MultiWordNet (Pianta et al., 2002). While taking advantage of distributional semantics can make the procedure fully automatic and faster, it is important to keep in mind that vector similarity actually approximates and

encompasses a wide range of theoretically distinct semantic relationships, like synonymy, antonymy, hyperonymy and so forth (Sahlgren, 2006; Turney and Pantel, 2010; Lenci, 2018). As a consequence, the kind of semantic relatedness on the basis of which target components get replaced is more coarse-grained than the one that is made available by a lexical resource like MultiWordNet (Pianta et al., 2002). On the other hand, by opting for a mostly hand-crafted lexical database we make sure to extract only words that partake in the semantic relationships we are interested in, but this procedure is far more time-consuming and brings into play a coverage issue, since such resources need constant updating and some of the target words might not be included (Farahmand and Henderson, 2016).

DSM variants. For both the verb and argument component of each target construction, we extracted its 10 nearest neighbours (NNs henceforth) in terms of cosine similarity in a DSM created from the La Repubblica corpus (Baroni et al., 2004) (about 331M tokens); this space used all the content words (nouns, verbs, adjectives and adverbs) with token frequency > 100 as target vectors and the top 30,000 content words as contexts, ending up with 26,432 vectors. The co-occurrence matrix, generated from a context window of ± 2 content words from each target word, was weighted by Positive Pointwise Mutual Information (PPMI) (Evert, 2008), a statistical association measure that assesses whether two elements x and y co-occur with a higher probability than the probability expected by chance and sets to zero all the negative results:

$$PPMI(x, y) = \max(0, \log \frac{P(x, y)}{P(x)P(y)})$$

The obtained matrix was reduced to 300 latent dimensions via Singular Value Decomposition (SVD) (Deerwester et al., 1990). The variants were finally obtained by combining the verb with each of the 10 NNs of the argument, the argument with each of the 10 NNs of the verb and every NN of the verb with every NN of

the argument. This resulted in 120 potential variants for each target expression, which were then extracted from itWaC. To provide some examples, starting from the idiom *dare i numeri* ‘to freak out’ (lit. ‘to give the numbers’) we extracted the 10 NNs of *numeri* obtaining *percentuale* ‘percentage’ (0.7231), *casella* ‘slot’ (0.7036), *graduatoria* ‘ranking’ (0.6956), and so forth, and the 10 NNs of *dare*, obtaining words like *confortare* ‘to comfort’ (0.6734), *mancare* ‘to miss’ (0.6711) and *confermare* ‘to confirm’ (0.6483), and so on. By combining the original verb with the noun NNs, we ended up with variants like *dare una percentuale* ‘to give a percentage’, *dare una casella* ‘to give a slot’ and *dare una graduatoria* ‘to give a ranking’. Viceversa, by combining the original noun with the verb NNs, we obtained variants like *confortare i numeri* ‘to comfort the numbers’, *mancare i numeri* ‘to miss the numbers’ and *confermare i numeri* ‘to confirm the numbers’. Finally, by combining the verb NNs and the noun NNs with one another, we got variants like *mancare una graduatoria* ‘to miss a ranking’, *confermare una percentuale* ‘to confirm a percentage’ and so forth. Of note, some of the created variants may not make sense and will be nearly impossible to actually find in corpora. First off, it is important to keep in mind that the distributional method is fully automatic, so it will inevitably bring on some noise in the data. Secondly, as we already touched upon, the non-occurrence of some variants in the corpus can also be regarded as an additional proof of the idiomaticity of the construction at issue. This is partly because an idiom represents a fixed combination that does not allow for altered forms to occur, and partly because some idioms embody frozen metaphors that, etymological reconstructions aside, are not accessible to speakers at a synchronic stage (Cacciari and Glucksberg, 1991; Gibbs, 1993) and involve selectional preference violations that stand out more after synonym replacement (e.g. *andare a genio* ‘to be to someone’s liking’ (lit. ‘to go to genius’) becomes *andare a invenzione* ‘to go to invention’ or *andare a estro* ‘to go to inspiration’).

iMWN variants. WordNet (Miller, 1995; Fellbaum, 1998) is a large-scale hand-crafted lexical database of English, where nouns, verbs, adjectives and adverbs are grouped into unordered sets of cognitive synonyms called *synsets*. Each synset conveys a distinct concept and contains a brief definition and some example sentences. For example, $\{car, auto, automobile, machine, motorcar\}$ form a synset with definition ‘a motor vehicle with four wheels; usually propelled by an internal combustion engine’. Each synset is linked to other synsets via a restricted set of conceptual relations, the most common being hyperonymy/hyponymy. The above synset, for instance, is connected to hyponymic synsets as $\{cab, hack, taxi, taxicab\}$ or $\{jeep, landrover\}$. Italian MultiWordNet (iMWN; Pianta et al. 2002) has been built in alignment with English WordNet. Two automatic procedures, in particular, have been exploited to speed up its realization. The Assign-procedure starts from word senses in the Italian-to-English section of the Collins bilingual dictionary and looks for candidate corresponding synsets in the original Princeton WordNet that might be associated with them. The Lexical Gaps-procedure checks for lacks of correspondence between the English and the Italian lexicon because one of the two languages may express through a lexical unit what the other language conveys with a free word combination. In this case, some synsets are built in iMWN without a correspondence to Princeton WordNet synsets. To generate our variants, for both the verb and argument component of each target construction, the words occurring in same synsets and its co-hyponyms were extracted from iMWN. For each verbal head, we extracted 5.9 synonyms/co-hyponyms on average (SD = 5.41), while for the noun arguments we extracted 25.18 synonyms/co-hyponyms on average (SD = 27.45). These iMWN variants were then put together via the same combinatorial procedure described for the distributionally derived variants and finally they were extracted from itWaC. To provide another example with *dare i numeri*, some synonyms and co-hyponyms extracted for *numero* were *aggravio* ‘rise’, *aumento* ‘increase’ and *cifra* ‘digit/sum’, while some synonyms and

co-hyponyms extracted for *dare* were *devolvere* ‘to devolve’, *dispensare* ‘to dispense’ and *distribuire* ‘to hand out’. Examples of iMWN-generated variants for *dare i numeri* are thus *dare un aumento* ‘to give a rise’, *distribuire i numeri* ‘to hand out the numbers’ and *devolvere una cifra* ‘to devolve a sum’.

2.3.2 Collecting idiomaticity judgments

To compare the variant-based distributional measures against a gold standard, we collected idiomaticity judgments for our 90 target idiomatic and non-idiomatic expressions from Linguistics students. Nine undergraduate and graduate students were presented with a list of our targets and asked to evaluate how idiomatic each expression was on a 1-7 Likert scale, with 1 standing for “totally compositional” and 7 standing for “totally idiomatic”. In the instructions, subjects were given a definition of idioms as figurative and conventional expressions whose meaning does not stem from the composition of the meaning of their subparts, and were provided with an example of idiom (*tagliare la corda* ‘to slip away’ lit. ‘to cut the rope’) and an example of non-idiomatic and more literal expression (*uccidere un uomo* ‘to kill a man’). In case an expression could receive two possible readings depending on the context, like *chiudere un occhio* ‘to close an eye’, which can also mean ‘to turn a blind eye (to something)’, subjects were asked to rate which meaning was more salient and frequent when thinking of the expression out of context. When presenting raters with our target list, the initial 90 phrases list was split into three sublists of 30 targets, each one being compiled by three subjects. Each of the 90 targets received therefore three idiomaticity judgments. Intercoder agreement, computed via Krippendorff’s α (Krippendorff, 2012), was 0.83 for the first sublist and 0.75 for both the second and the third sublist. Following common practice, we interpreted these values as evidence of reliability for the collected judgments (Artstein and Poesio, 2008). We chose Krippendorff’s α as our inter-

rater agreement measure since it has proven to be suitable for ordinal scores like Likert scales and can be employed irrespectively of the number of observers and the presence or absence of missing data (Hayes and Krippendorff, 2007). The mean idiomaticity rating assigned to each target phrase is reported in Table A.2 in the Appendix. Gold standard idiomaticity ratings (Figure 2.1) confirmed the

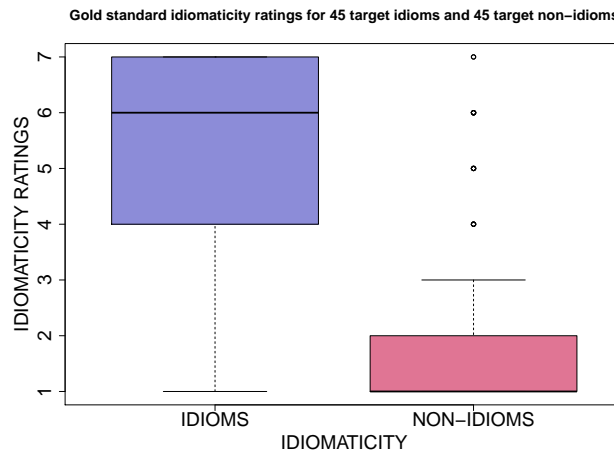


Figure 2.1: Boxplot of gold standard idiomaticity ratings given to the set of 45 target idioms and 45 target non-idioms.

distinction we made between our idiom set and our non-idiom set to be sound. Idioms obtained an average score of 5.25 (SD = 1.73), while non-idioms obtained an average score of 1.85 (SD = 1.57). This difference was proven by a Wilcoxon signed-rank test to be statistically significant ($W = 16256, p < .001$). Nevertheless, it is still worth pointing out that idiom ratings appear to be more distributed along the 1 to 7 scale with respect to non-idiomatic ratings, with a higher standard deviation, while non-idioms are mostly flattened against the low end of the scale. This confirms that while what makes a literal and non-idiomatic phrase is pretty clear to speakers, idiomaticity is not a black-or-white phenomenon and idioms are rather a quite variegated class, exhibiting varying levels of semantic opacity and formal frozenness.

2.4 Experiment 1

In the first experiment, we aimed at verifying our predictions on a subset of our 90 target constructions that had a considerable number of variants represented in the corpus, so as to create reliable vector representations for them. We therefore selected those constructions that had at least 5 DSM and 5 iMWN variants occurring more than 100 times in itWaC. This selection resulted in a final set of 26 targets (13 idioms + 13 non-idioms).

2.4.1 Data extraction and method

While the dimension of the La Repubblica corpus (about 331M tokens) seemed to be enough for the variants extraction procedure, we resorted to five-times bigger itWaC (about 1,909M tokens) to represent the variants as vectors and compute the compositionality scores in order to avoid data sparseness and have a considerable number of variants frequently attested in our corpus. Using two different corpora has the additional advantage of showing the variants method to be generalizable to corpora of different text genres and size. Two DSMs were thus built on the itWaC corpus, the first one representing the 26 targets and their DSM variants with token frequency > 100 as vectors, and the second one representing as vectors the 26 targets and their iMWN variants with token frequency > 100 . Co-occurrences were recorded by counting how many times each target or variant construction occurred in the same sentence with each of the 30,000 top content words in the corpus. The two matrices were weighted with PPMI and reduced to 300 dimensions via SVD.

Four different measures were tested to compute how much the vector representations of the targets differed from those of their respective variants:

- **Mean:** The mean of the cosine similarities between the vector of a target

construction and the vectors of its variants;

- **Max:** The maximum value among the cosine similarities between the vector of a target construction and the vectors of its variants;
- **Min:** The minimum value among the cosine similarities between the vector of a target construction and the vectors of its variants;
- **Centroid:** The cosine similarity between the vector of a target expression and the centroid of the vectors of its variants (i.e. the average of the variant vectors, given that the notion of centroid generalizes the notion of mean to multidimensional spaces).

In both the DSMs, each of these four measures was computed for each of our 26 targets. We then sorted the targets in ascending order for each of the four scores, creating a ranking in which we expected idioms (our positives) to be placed at the top and non-idioms (our negatives) to be placed at the bottom, since idioms were expected to be less similar to the vectors of their lexical variants.

2.4.2 Results and discussion

The main goal of this study was to assess whether our variant-based method was suitable for identifying idiom types. Hence we evaluated the goodness of our four measures (Mean, Max, Min and Centroid) in placing idioms before non-idioms in the rankings generated by our idiomaticity indices.

As explained at the end of Section 2.4.1, for both the DSM space and the iMWN space, we computed the four compositionality indices (Mean, Max, Min, Centroid) for all the 26 target phrases and, for each measure, we ranked the targets in ascending order. In each resulting ranking, we expected idioms (our positives) to be all placed at the top and non-idioms (our negatives) to be put

at the bottom of the ranking. The ranking performance of our algorithms will be first analyzed via interpolated precision-recall curves. Precision and recall are some of the most common evaluation measures in information retrieval (Manning and Schütze, 1999). When performing a classification task, the items that get correctly labeled as positives are called *true positives*, while the items that are incorrectly labeled as belonging to the positive class are called *false positives*. By the same token, the items that are correctly and incorrectly labeled as negatives will be called *true negatives* and *false negatives* respectively. On the one hand, precision measures what proportion of retrieved items is relevant:

$$precision = \frac{tp}{tp + fp}$$

On the other hand, recall measures what proportion of relevant items is retrieved:

$$recall = \frac{tp}{tp + fn}$$

As in Figures 2.2 and 2.3, precision can be plotted against recall in precision-recall curves, where at recall level α , precision β is computed at the position of the ranking where the proportion of retrieved idioms equals α . There is obviously a trade-off between precision and recall (Manning and Schütze, 1999): when just the first positions of the ranking are taken into account, most of the items will be positives (i.e. idioms) and precision will be high, but just a few out of all the idioms will have been retrieved, so recall will be quite low. By contrast, if we go down the ranking until all positives are retrieved, recall will be 100%, but precision will decrease, since we will inevitably find some non-idioms being placed higher up. More precisely, the curves we are going to depict are *interpolated* precision-recall curves: for a given recall level α , we take the highest precision β for whatever recall level $\alpha' \geq \alpha$. The reason is that the user will be willing to scroll further down the ranking if precision gets higher while increasing recall. To get a sense of

the overall performance of an algorithm and of the trade-off between precision and recall, the two measures can be combined into the F-measure, which corresponds to their harmonic mean:

$$F = 2 \cdot \frac{\textit{precision} \cdot \textit{recall}}{\textit{precision} + \textit{recall}}$$

Figures 2.2 and 2.3 plot the interpolated precision-recall curves for the four measures in the two trained DSMs plus a random baseline. In the DSM variants model, Max, Mean and Centroid performed better than Min and the baseline. Max showed high precision at low levels of recall (< 40%), but it dropped as far as higher recall levels were reached, while Mean and Centroid kept higher precision at higher levels of recall. Min initially performed comparably to Mean, but it drastically dropped after 50% of recall.

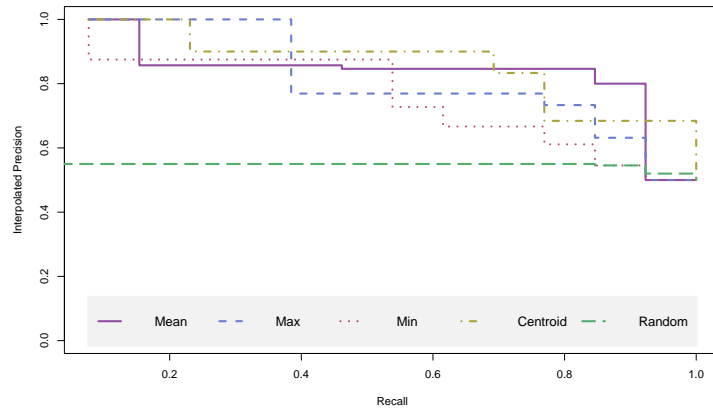


Figure 2.2: Interpolated Precision-Recall curve for Mean, Max, Min, Centroid and the baseline in the DSM variants space with 26 targets.

In the iMWN variants space both Mean and Centroid performed better than the other measures, with the baseline being the worst one. Both Max and Min exhibited the same pattern, with high precision at low recall levels and a subsequent drop in performance around 50% of recall.

The first two columns of Table 2.1 show the Interpolated Average Precision

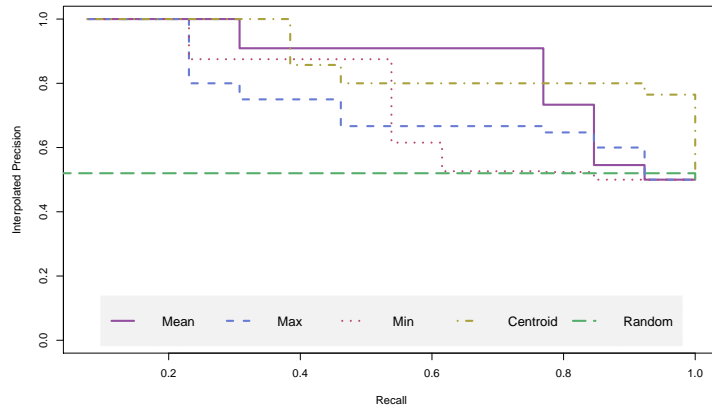


Figure 2.3: Interpolated Precision-Recall curve for Mean, Max, Min, Centroid and the baseline in the iMWN variants space with 26 targets.

Model	IAP	F	ρ
DSM Centroid	.83	.77	-.66***
iMWN Centroid	.87	.77	-.59**
DSM Mean	.80	.85	-.63***
iMWN Mean	.80	.77	-.58**
DSM Max	.74	.77	-.60**
iMWN Max	.68	.62	-.30
DSM Min	.69	.62	-.37
iMWN Min	.65	.62	-.28
Random	.53	.46	.30

Table 2.1: Interpolated Average Precision, F-measure at the median and Spearman’s ρ correlation with the speaker judgments for the models with 26 targets (** = $p < .01$, *** = $p < .001$).

(IAP) and the F-measure of all the models employed in this first experiment. Following Fazly et al. (2009), Interpolated Average Precision consists in the average of the interpolated precisions at recall levels of 20%, 50% and 80%, while F-measure is computed for the median. Both iMWN and DSM Mean and Centroid, together with DSM Max, had the highest IAPs, therefore standing out as the models that succeeded the most in placing idioms before non-idioms in the obtained rankings and exhibited the best trade-off between precision and recall, as shown by the F-measure values. The third column in Table 2.1 shows Spearman’s ρ correlation

between our models and the speaker-elicited idiomaticity judgments we described in Section 2.3.2. The Mean and the Centroid similarity in both the DSM and the iMWN variants spaces and the Max similarity in the DSM variants spaces showed a significant strong negative correlation with the speaker-collected ratings: the less the vector of a given expression resulted similar to the vectors of its lexical variants, the more the subjects perceived the expression as idiomatic. iMWN Min, DSM Min and iMWN Max exhibited a weak, non-significant, negative correlation, while the baseline showed a non-significant weak positive correlation score. All in all, Centroid and Mean turned out as the best measures in separating idioms from non-idioms, while there was no clear advantage of one variant type (DSM or iMWN) over the other.

2.5 Experiment 2

The first experiment proved our variant-based distributional measures to be suitable for telling apart idioms and non-idioms that had a fair number of lexical variants occurring in our corpus with considerable frequency, with the Mean and the Centroid measures performing the best. The research question at the root of the following experiment was whether such measures could be extended to all the 90 target constructions in our dataset (45 idioms + 45 non-idioms), including expressions whose lexical variants were poorly represented or not at all found in itWaC. Such negative evidence, in our reasoning, should be taken into account as an additional clue of the restricted lexical transformability of the expressions under investigation and, consequently, of their idiosyncratic and idiomatic status.

2.5.1 Data extraction and method

As in the first experiment, two kinds of DSMs were built from itWaC, the former comprising the 90 initial idiomatic and non-idiomatic expressions and their DSM variants as target vectors and the latter considering the 90 expressions and their iMWN variants as target vectors. The parameters of these vector spaces are identical to those used in Experiment 1. The vectors of the targets were compared to the vectors of their variants by means of the four measures described in Section 2.4.1 (Mean, Max, Min, Centroid). Aside from the method chosen to extract the variants (DSM vs iMWN), the parameter space explored in constructing the DSMs for the second experiment further comprised the following options:

Number of variants per target. For both the variants that were extracted distributionally and those that were chosen from iMWN, we built different DSMs, each time setting a fixed number of alternative forms for each target expression. As for the DSM-generated variants, we kept the alternative expressions that were generated by combining just the top 3, 4, 5 or 6 cosine neighbours of each verb and argument component of the initial 90 targets. As a result, we obtained 4 types of spaces, in which each target had respectively 15, 24, 35 and 48 variants represented as vectors. As for the spaces built with the iMWN variants, we experimented with eight types of DSMs. In the first four, we kept the variants that were created by combining just the top 3, 4, 5 or 6 synonyms and co-hyponyms of each component of the initial 90 targets in terms of cosine similarity. These cosine similarities were extracted from a DSM trained on the La Repubblica corpus that had the same parameters as the space used to extract the DSM variants and described in Section 2.3.1. In the other four, we used the top 3, 4, 5 or 6 synonyms and co-hyponyms that were most frequent in itWaC.

Encoding of non-occurring variants. In each of the DSMs obtained above,

Space	Total zero variants	Zero variants per target	
		Mean	SD
DSM 48_{var}	1451	16.12	8.69
iMWN $_{cos}$ 48_{var}	734	8.16	8.44
iMWN $_{freq}$ 48_{var}	452	5.02	7.25

Table 2.2: Number of non-attested variants for each of the three DSM spaces built from 90 targets plus 48 DSM variants, 48 iMWN variants filtered by cosine similarity and 48 iMWN variants filtered by frequency respectively.

every target was associated with a fixed number of lexical variants, some of them not occurring in our corpus. Table 2.6 reports how many variants were not attested in our corpus for each of the three spaces we built with the maximum number of variants (DSM 48_{var} , iMWN $_{cos}$ 48_{var} and iMWN $_{freq}$ 48_{var}). As we can see, the issue of non-attested variants was an across-the-board phenomenon which involved each of the three space types, although the iMWN $_{cos}$ space had half the zero variants of the DSM space and the iMWN $_{freq}$ space had less than a third of the zero variants of the DSM space. Manually selecting the verb and the noun synonyms from a hand-crafted lexical resource, despite being time-consuming, led thus to generating more sensible variants. We will see in the following sections whether this difference actually affected the performance of the various models. Anyway, as the high SD values show, there was high variability in the number of zero variants for each target.

We experimented with two different ways of addressing this problem. In the first case, we simply did not take them into account, thus focusing only on the positive evidence in our corpus. In the second case, we represented them as vectors that are orthogonal to the vectors of their target. For the Mean, Max and Min measures, this merely consisted in automatically setting to 0.0 the cosine similarity between a target vector and a non-attested variant vector. For the Centroid measure, we first computed the cosine similarity between the vector of a

target expression and the centroid of its attested variants and then hypothesized that each zero variant contributed by a constant factor k in tilting this centroid similarity towards 0.0. Preliminary investigations have proved a k -value of 0.01 to give reliable results. Concretely, from the centroid similarity computed with the attested variants (cs_a), we subtracted the product of k and cs_a multiplied by the number of non-attested variants (n) for the construction under consideration, obtaining a final centroid similarity that also includes non-attested variants:

$$Centroid = cs_a - (cs_a \cdot k \cdot n)$$

Crucially, we decided to multiply k by the original Centroid similarity to account for the fact that non-attested variants were not expected to contribute in modifying the original cosine value towards zero always in the same way, but depending on the specific target construction at issue and on the positive evidence available for it. Table 2.3 summarizes the parameters explored in building the DSMs for the second experiment. In each model resulting from the combination of these parameters, we ranked our 90 targets in ascending order according to the idiomaticity scores given by the four variant-based distributional measures (Mean, Max, Min, and Centroid).

Parameter	Values
Variants source	DSM, iMWN
Variants filter	cosine (DSM, iMWN), raw frequency (iMWN)
Variants per target	15, 24, 35, 48
Non-attested variants	not considered (<i>no</i>), orthogonal vectors (<i>orth</i>)
Measures	Mean, Max, Min, Centroid

Table 2.3: Parameters explored in creating the DSMs for Experiment 2.

2.5.2 Results and discussion

All the 96 models obtained by combining the parameters in Table 2.3 had higher IAP and F-measure scores than the random baseline, with the exception of two models displaying lower (iMWN_{cos} 35_{var} Centroid_{orth}) or comparable (iMWN_{freq} 15_{var} Centroid_{orth}) F scores. All the models had significant correlational scores with the human-elicited ratings save 7 non-significant models. Table 2.4 reports the 5 best models for IAP, F-measure at the median and Spearman’s ρ correlation with our gold standard idiomaticity judgments respectively. The compositionality score assigned to each VN target phrase by the top IAP, F-measure and ρ model respectively is reported in Table A.2 in the Appendix. All the best models predictably employed the Centroid measure, which already turned out to perform better than the other indices in the first part of our study. The best performance in placing idioms before non-idioms (IAP) and the best trade-off between precision and recall (F-measure) were exhibited both by models that considered (*orth*) and not considered (*no*) non-attested variants, with a prevalence of the latter models. Moreover, the top IAP and top F-measure models used both DSM and iMWN variants. On the other hand, the models correlating the best with the judgments all took non-occurring variants into account as orthogonal vectors and all made use of iMWN variants. There seemed not to be an effect of the number of variants per target across all the three evaluation measures. What comes to the fore so far is that while zero variants are not essential to carry out idiom vs non-idiom classification, they acquire more importance in a more complex and fine-grained task like correlating with the idiomaticity continuum perceived by subjects.

After listing the best overall models for each evaluation measure, we resorted to linear regression to assess the influence of the parameter settings on the performance of our models, following the methodology proposed by Lapesa and Evert (2014). In a series of linear models we thus predicted the IAP, F-measure and

Top IAP Models	IAP	F	ρ
iMWN _{cos} 15 _{var} Centroid _{no}	.91	.80	-.58***
iMWN _{cos} 24 _{var} Centroid _{no}	.91	.78	-.62***
iMWN _{cos} 35 _{var} Centroid _{no}	.91	.82	-.60***
DSM 48 _{var} Centroid _{no}	.89	.82	-.64***
DSM 48 _{var} Centroid _{orth}	.89	.82	-.60***
Top F-measure Models	IAP	F	ρ
iMWN _{cos} 35 _{var} Centroid _{no}	.91	.82	-.60***
DSM 48 _{var} Centroid _{no}	.89	.82	-.64***
DSM 48 _{var} Centroid _{orth}	.89	.82	-.60***
iMWN _{cos} 15 _{var} Centroid _{no}	.91	.80	-.58***
DSM 24 _{var} Centroid _{no}	.89	.80	-.60***
Top ρ Models	IAP	F	ρ
iMWN _{cos} 48 _{var} Centroid _{orth}	.86	.80	-.67***
iMWN _{cos} 35 _{var} Centroid _{orth}	.72	.44	-.66***
iMWN _{cos} 24 _{var} Centroid _{orth}	.85	.78	-.66***
iMWN _{cos} 15 _{var} Centroid _{orth}	.88	.80	-.65***
iMWN _{freq} 15 _{var} Centroid _{orth}	.66	.51	-.65***
Random	.55	.51	.05

Table 2.4: Best 5 models with 90 targets for IAP (top), F-measure at the median (middle) and Spearman’s ρ correlation with the speaker judgments (bottom) against the random baseline (***) = $p < .001$).

Spearman’s ρ of all our models by using the various parameter settings of each model, and their interactions, as predictors. As for the IAP and correlation with human judgments, our linear models achieved adjusted R^2 of 0.90 and 0.94 respectively, therefore explaining the influence of our parameters and their interactions on these two evaluation measures very well. In predicting F-measure, our linear model reported an adjusted R^2 of 0.52. Figure 2.4 depicts the rankings of our parameters according to their importance in a feature ablation setting. The ΔR^2 values can be understood as a measure of the importance of a parameter and are calculated as the difference in fit that is registered by removing the target parameter together with all the pairwise interactions involving it from our full models. The parameters we refer to are the same listed in Table 2.3, with the exception of the parameter *model*, which merges the *variants source* and the *variants filter*

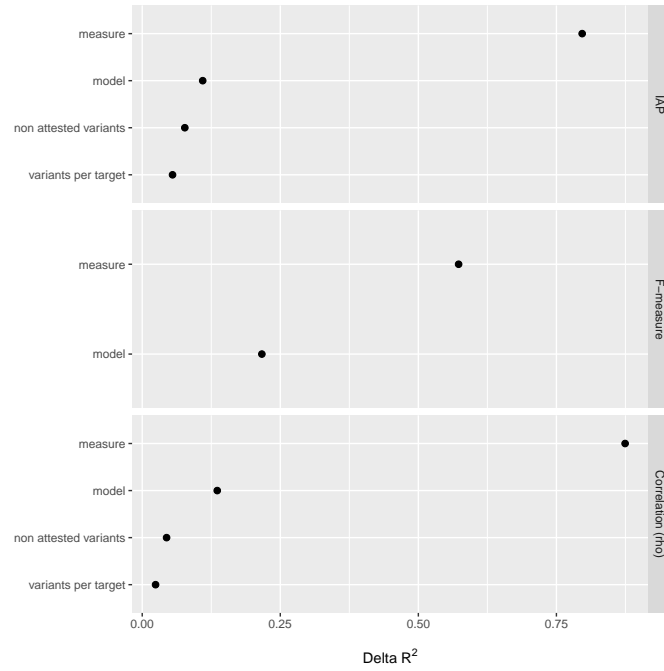


Figure 2.4: Parameters and feature ablation for IAP, F-measure and correlation with the human ratings.

parameters. For all our three evaluation measures, *measure* (i.e. Mean, Max, Min vs Centroid) turned out to be the most influential parameter, followed by *model* (i.e. DSM, $iMWN_{cos}$ vs $iMWN_{freq}$). As for the *measure* parameter, both in the IAP and in the ρ models the best performing setting is Centroid, followed by Mean, Max and Min, all being significantly different from each other (Figure 2.5). In the F-measure model, only Min, i.e. the worst performing model, was significantly different from the other settings (Figure 2.6). As for *model*, the $iMWN_{freq}$ setting was significantly worse than DSM and $iMWN_{cos}$ in the IAP and in the ρ models (Figure 2.7), but not in the F-measure one (Figure 2.8). Table 2.5 reports all the significant pairwise interactions and their ΔR^2 . In line with results reported in Figure 2.4, almost all the interactions involved the *model* parameter. Figure 2.9 displays the interaction between *measure* and *model* when modeling IAP. The best models, DSM and $iMWN_{cos}$, had a different performance on the worst measure (Min) but converged on the two best ones (Mean and Centroid). On the other side, $iMWN_{freq}$ showed a less dramatic improvement and reached a

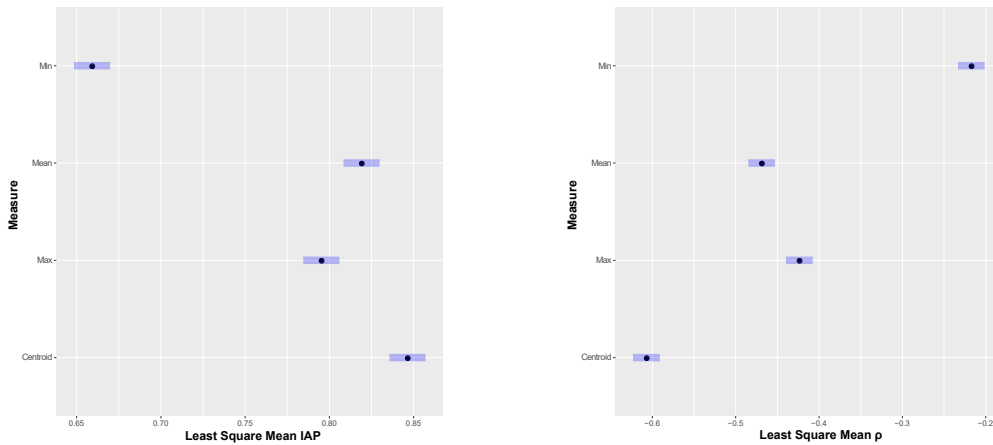


Figure 2.5: Least Square Mean IAP and ρ for four Measures.

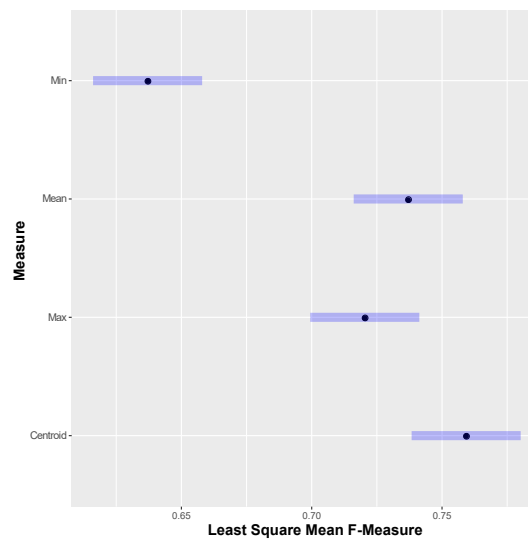


Figure 2.6: Least Square Mean F-measure for Four Measures.

plateau after moving away from the Min setting. Figure 2.10 shows that in the F-measure setting the DSM model had a steeper improvement when moving from the Min measure to Max, Mean or Centroid, as compared to the $iMWN_{cos}$ and the $iMWN_{freq}$ models. Figure 2.11 shows that in the correlation setting the $iMWN_{cos}$ and the DSM models outperformed the $iMWN_{freq}$ model only when exploiting the Min and the Mean measures. Remember that the correlational scores with the human ratings are negative and therefore points that are positioned lower on the y -axis indicate better performance. Figures 2.12 and 2.13 plot the interaction between *model* and the way of encoding *non-attested variants* in the IAP and in

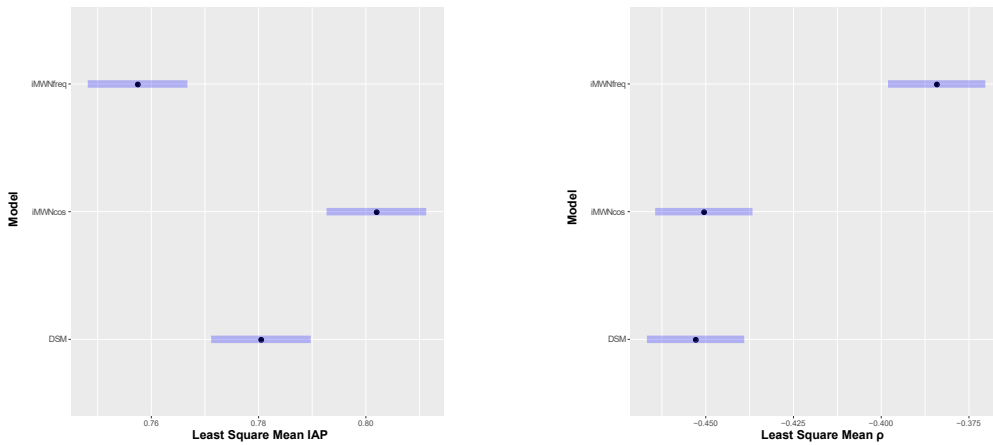


Figure 2.7: Least Square Mean IAP and ρ for three Models.

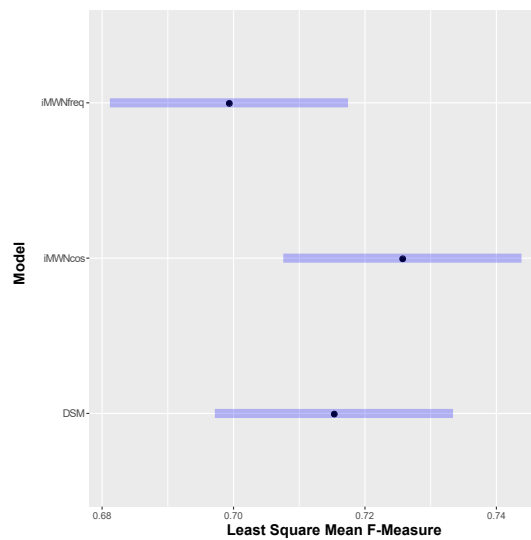


Figure 2.8: Least Square Mean F-measure for three Models.

the ρ models, respectively. In both cases, only the two iMWN models appeared to be sensitive to the way non-attested variants are handled. In the IAP model, zero variants appeared to be the outperforming setting, while the ρ model showed the opposite pattern. In both models, moreover, the best overall setting always involve the iMWN_{cos} model.

Figures 2.14 and 2.15 display the interactions between *measure* and the way of encoding *non-attested variants*. In the IAP model, ignoring the non-attested variants resulted in a significantly better performance only when using the Max and Centroid measures. In the ρ model, however, accounting for the effects of

Interaction	ΔR^2		
	IAP	F	ρ
model:measure	.03	.13	.08
model:non-attested var	.01	<i>n.s.</i>	.02
non-attested var:measure	.02	<i>n.s.</i>	.01
model:variants per target	.02	<i>n.s.</i>	<i>n.s.</i>

Table 2.5: Significant interactions and ΔR^2 for IAP, F-measure at the median and Spearman’s ρ correlation with the speaker judgments.

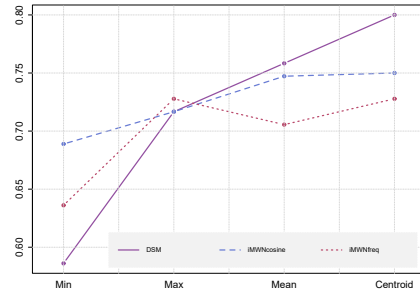
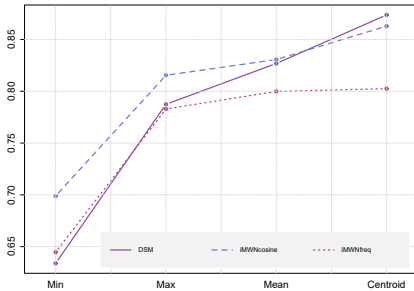


Figure 2.9: IAP, measure/model. Figure 2.10: F-measure, measure/model.

non-attested variants outperformed the other setting only when using the Min and Mean measures. The interaction between the number of *variants per target* and the *model* when modeling IAP is displayed in Figure 2.16. We observed a strong effect of the variants number on the performance of $iMWN_{freq}$, with more variants leading to a better performance. There was a significant advantage of $iMWN_{cos}$ over the other models when using 15 variants, but this advantage was lost as the number of variants increased. All in all, the Centroid measure appeared to perform better than the other three measures, with Min obtaining the worst results. The DSM and the $iMWN_{cos}$ models performed consistently better than $iMWN_{freq}$, while the advantage of either way of encoding non-attested variants (*no* vs *orth*) over the other depended on the kind of task at issue. More specifically, while not encoding zero variants turned out to be better in terms of placing idioms before non-idioms in the final rankings, encoding zero variants as orthogonal vectors seemed to better align the compositionality scores with idiomaticity as it was

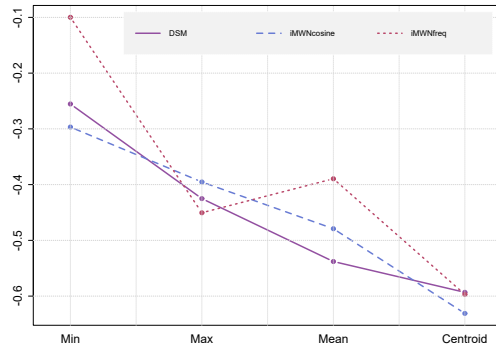


Figure 2.11: ρ , measure / model.

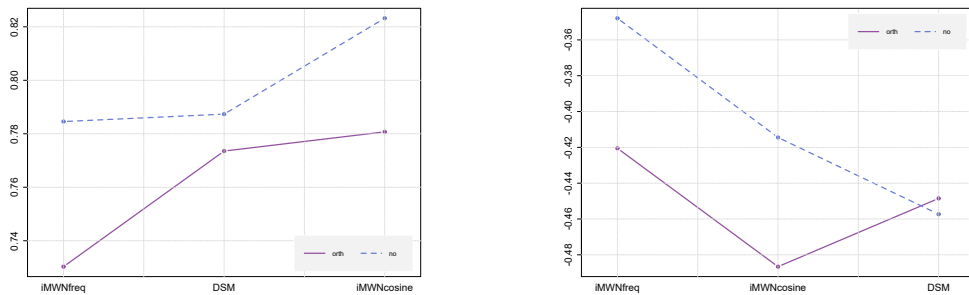


Figure 2.12: IAP, model / non-attested variants. Figure 2.13: ρ , model/non-attested variants.

perceived by subjects. Finally, the number of variants per target did not appear to consistently influence the performance of our models and it revealed that satisfying performances can be achieved even with a reduced number of variants when using cosine-filtered iMWN models.

2.5.3 Error Analysis

An error analysis serves the purpose to spot out those expressions where our classification algorithm fell short. A qualitative inspection of our data brought out that among the most frequent false positives (i.e. non-idioms placed above the ranking median) in our iMWN models there were expressions like *giocare a carte* ('to play cards'), *seguire un evento* 'to follow an event' or *entrare in*

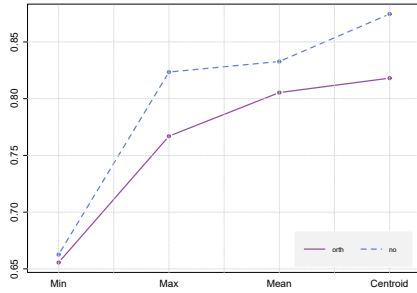


Figure 2.14: IAP, measure / non-attested variants

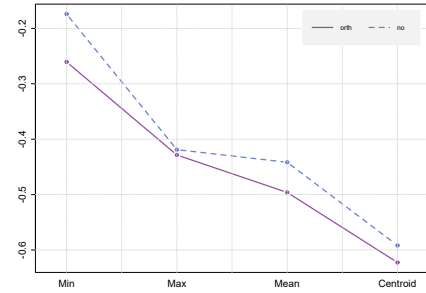


Figure 2.15: ρ , measure / non-attested variants.

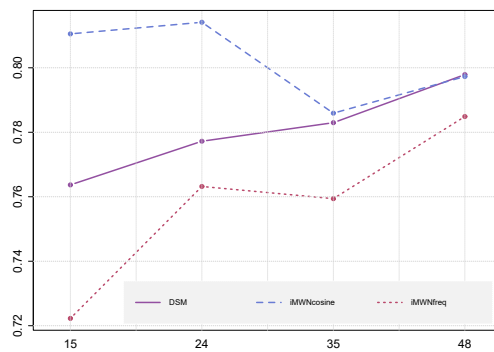


Figure 2.16: IAP, variants per target / model.

città ('to get into town'). Despite being literal and compositional, these word combinations may actually display some form of collocational behavior, probably in that they denote specific events that cannot be rephrased using different words. Among wrongly labeled non-idioms we also find expressions like *entrare in crisi* 'to get into a crisis' and *abbassare la guardia* 'to let one's guard down'. As we pointed out when introducing our dataset (Section 2.3.1), we framed our task as a classification between idioms and non-idioms rather than between idioms and literals because compositionality is distributed along a cline rather than being a clear-cut feature and we aimed at assessing whether our method could effectively set apart pure idioms from all the rest. These phrases are compositional to some extent with respect to idioms, but their verbs are in fact used in a sense that does not fully match their literal and concrete meaning. If we look at the boxplot in

Figure 2.1 again, some outliers indeed appeared among what we labeled as non-idioms, including *entrare in crisi* and *abbassare la guardia*, which got an average idiomaticity rating of 4.33 and 6 respectively. While it might be the case that we put them in the wrong class in the first place, the reasoning that led us to include them into non-idioms is that their subparts can occur by themselves while keeping their compositional standalone meaning. To provide some examples, Italians can say *fare la guardia* ‘to keep watch’ and *abbassare la stima (di qualcuno)* ‘to lower one’s esteem’, using *guardia* and *abbassare* in their respective meanings, which combine together in *abbassare la guardia*. The same applies to *aprire un conto* ‘to open up a bank account’, which pops up as a false positive in iMWN models using orthogonal vectors to encode zero variants. The most common false positives in the DSM models are roughly the same as in the iMWN models, except *seguire un evento*, which is correctly labeled in all models. Conversely, among the most frequent false negatives (i.e. idioms that were classified as non-idioms by being placed below the median) in iMWN models, we found idioms like *cadere dal cielo* ‘to fall from the sky, to be heaven-sent’, *cambiare colore* ‘to change color’ and *aprire gli occhi* ‘to open one’s eyes’ that happen to be ambiguous in that they make both an idiomatic and a literal reading possible according to the context. It is possible that the evidence available in our corpus privileged a literal reading for them. As regards false negatives in DSM models, we found the same idioms as in iMWN models, with the addition of *arrivare al capolinea* ‘to reach the end of the line’, which appeared as false negative in the models that used orthogonal vectors for non-occurring variants. Such ambiguous expressions should be analyzed in more detail in following contributions by means of token detection algorithms that precisely tell apart idiomatic and literal usages of these expressions in context.

2.6 Extending the approach to AN expressions

In the first series of experiments we successfully tested our variant-based compositionality scores on VN idiomatic and non-idiomatic constructions. We have demonstrated that they are reliable also when applied to constructions that have a great deal of variants that do not occur in corpora. In particular taking information about these non-occurring variants into account seems to generate compositionality scores that more closely align with speaker-elicited idiomaticity judgments. By means of a feature ablation analysis we have also understood which parameters are more influential on the performance of our models, namely the way variants are extracted and filtered, with DSM and $iMWN_{cos}$ models faring better than $iMWN_{freq}$ ones, and the type of measure selected, with Centroid as the silver bullet.

A great deal of corpus-based and computational research on idiomaticity to date has focused on verbal phrases (Baldwin et al., 2003; McCarthy et al., 2003; Bannard, 2007; Wulff, 2008; Fazly et al., 2009), mostly putting aside adjective-noun (AN henceforth) combinations. As we saw, word combinations that take place between a verb and a noun give rise to a variety of constructions that are distributed on a continuum of idiomaticity and semantic compositionality, going from collocations to light verb constructions to idioms (Fazly and Stevenson, 2008). Interestingly, the semantics of adjective-noun combinations is not always straightforward as well, but it rather constitutes a gradient and multifaceted phenomenon. Entailment-based examples can give a sense of such complexity. While a sentence like *John has bought a white car* entails *John has bought something white* and *John has bought a car*, saying that *John is a skilled optician* for sure entails he’s an *optician*, but not necessarily that he’s *skilled* in general as a person. Moving further on, if John is an *alleged murderer*, we are not even sure he’s a murderer at all and it’s not even grammatical to say **John is alleged*. Finally,

if one were to utter *I thought John was the murderer, but actually he was just a red herring*, they wouldn't be claiming John is either *red* or a *herring*, but they would be just figuratively asserting that John has taken their attention away from the real murderer. All these different entailment patterns exhibited by *white car*, *skilled optician*, *alleged murderer* and *red herring* show the complexity and variability of the compositionality of adjective-noun (AN henceforth) pairs. In formal semantic terms (Montague, 1970; Kamp, 1975), while the denotation of *white car* is said to be represented by the *intersection* of the denotations of *white* and *car* and the meaning of *skilled optician* is conceived as a *subset* of the denotation of *optician*, the *intensional* adjective *alleged* in *alleged murderer* is treated as a higher-order property that manipulates the modal parameter that is relevant for the interpretation of *murderer* (Chierchia and McConnell-Ginet, 1990). Lastly and quite predictably in light of the ongoing discussion, *red herring* classifies as an *idiom*. While previous computational literature on AN compositionality has been mainly concerned with the first three cases presented above (i.e. intersective, subsective and intensional), existing computational research on idiomaticity, as we said, has mainly investigated verbal phrase structures. In the present section we then switch our focus onto the most opaque end of the AN compositionality continuum, by applying our variant-based indices to tease apart Italian AN idioms and non-idioms.

As an additional aim of our analysis, the performance of our indices will also be compared with that of addition-based and multiplication-based measures, which are taken as a reference point in the distributional literature on compositionality modeling (Mitchell and Lapata, 2010; Krčmář et al., 2013). Lastly, to observe if relying on a different type of distributional information to generate lexical variants has an impact on the model performance, in addition to linear DSMs and Italian MultiWordNet, we also experimented with syntax-enriched distributional spaces (Padó and Lapata, 2007; Baroni and Lenci, 2010), which keep track of the

dependency relations between our targets and their contexts, as source spaces for our lexical variants.

2.6.1 Previous work on AN compositionality modeling

Existing computational research on AN compositionality does not tackle idiomatic cases specifically, but it rather frames the issue in more general terms or focuses on intensional vs non-intensional adjectival modification. In the following paragraph, we will go through these previous approaches, before presenting our variant-based computational scores that will take into account the extreme non-compositional end of the AN compositionality continuum.

Starting from the same general vector-based compositional models (Mitchell and Lapata, 2010; Krčmář et al., 2013) that have been applied to verb-noun structures as well, first off the *weighted additive* model derives the vector of a complex phrase p from the weighted sum of the vectors of its components u and v (which in our case stand for the adjective and the noun respectively) and roughly corresponds to feature union:

$$p = \alpha u + \beta v \tag{2.1}$$

The *pointwise multiplicative* model, which corresponds to feature intersection, multiplies each corresponding pair of dimensions of the u and v vectors to derive the corresponding dimension of the p vector. In this way, mutually exclusive features are reduced to zero in the final vector:

$$p = u_i v_i \tag{2.2}$$

Finally, the *dilation* model decomposes a head vector v (the noun vector in AN strings) into a parallel and an orthogonal component with respect to the modifier

vector u (the adjective vector) and stretches the parallel component by a factor λ :

$$p = (\lambda - 1)(u \cdot v)u + (u \cdot u)v \quad (2.3)$$

So as to balance the way adjectives and nouns contribute to the meaning of the whole phrase, Guevara (2010) proposes a *full additive* model, in which the two n -dimensional component vectors are multiplied by two $n \times n$ weight matrices before being summed:

$$p = Au + Bv \quad (2.4)$$

The two A and B matrices are estimated by means of partial least squares regression, using u and v as predictors and the corresponding observed AN pair vector as dependent variable. The problem of estimating the A and B matrices in a full additive model is also investigated by Zanzotto et al. (2010), who come up with a linear equation system that is solved by resorting to Moore-Penrose pseudo-inverse matrices (Penrose, 1955). To take account of the fact that each adjective can interact differently with the semantics of the noun it modifies, Baroni and Zamparelli (2010) propose a *lexical function model* that draws on the Fregean conception of compositionality as function application and learns adjective-specific functions by predicting the dimensions of the observed AN pair vectors from the dimensions of the component noun vectors. The estimated matrix U is then multiplied by the noun vector v :

$$p = Uv \quad (2.5)$$

The adjective is then conceived of as a function that takes the meaning of the noun as an argument and returns the meaning of the modified noun. Boleda et al. (2013) compare the performance of all the aforementioned compositionality models on intensional vs non-intensional adjectival modification. Their hypothesis is that the full additive and the lexical function models should achieve better scores in modeling intensional modification, since they should represent an attempt to

transpose formal semantics higher-order modification into distributional semantic terms. On the contrary, non-intensional adjectival modification should be modeled equally well by the weighted additive and the pointwise multiplicative ones, which are supposed to reflect feature combination. Their findings anyway show an overall better performance of matrix-based methods, irrespectively of the kind of modification at play (intensional vs non-intensional). To obviate the limitation of the lexical function model in treating rare adjectives, Bride et al. (2015) come up with tensor for adjectival composition which replaces adjective-specific matrices and is multiplied by the adjective vector u with a tensor dot product. The resulting matrix X is then multiplied with the noun vector. Hartung et al. (2017) apply all the compositional operations listed so far on CBOW word embeddings (Mikolov et al., 2013a) of adjectives and nouns, registering superior performances with respect to count-based models in attribute selection and phrase similarity prediction tasks. Finally, Asher et al. (2017) resort to Latent Vector Weighting and tensor factorization to implement the Type Composition Logic (Asher, 2011) conception of adjective-noun composition as a combination of two properties respectively representing the contextual contribution of the noun on the adjectival meaning and vice versa.

All the works mentioned above do not address idiomaticity in AN combinations specifically, while works on idiom type detection usually do not consider AN structures. Therefore we aim at filling this gap with our experiments on automatic AN idiom detection.

2.6.2 Dataset and variant extraction

All in all, our dataset is composed of 24 types of Italian noun-adjective and adjective-noun combinations, including 12 Italian idioms selected from an idiom dictionary (Quartu, 1993) and then extracted from the itWaC corpus (Baroni

et al., 2009), which totalizes about 1,909M tokens. The frequency of these targets vary from 21 (*alte sfere* ‘high places’, lit. ‘high spheres’) to 194 (*punto debole* ‘weak point, weak spot’). The reduced dimension and frequency of our idiom dataset was due to the difficulty of finding adjective-noun idioms that were well represented in our corpus, differently from verbal idioms. Nevertheless, we still intended to observe whether even with such limited data we could achieve effective results. The remaining 12 items are compositional pairs of comparable frequencies (e.g., *nuova legge* ‘new law’ or *scrittore famoso* ‘famous writer’). The complete list of target AN idiomatic and non-idiomatic phrases, together with their itWaC frequency, is reported in Table A.3 in the Appendix. Our variants were then generated from a linear DSM and the Italian section of MultiWordNet as in our experiments on VN combinations, plus from a structured syntax-based DSM.

Linear DSM variants. As described in Section 2.3.1, for both the noun and the adjective of each target, we extracted its top cosine neighbors in a window-based DSM created from the La Repubblica corpus. In the previous experiments we tried using different thresholds of selected top neighbors (3, 4, 5 and 6). Since the number of top neighbors that were extracted for each constituent of the target did not significantly affect our performances, we decided to use the maximum number (i.e., 6) for the present study. In the DSM, all the content words occurring more than 100 times were represented as target vectors, ending up with 26,432 vectors, while the top 30,000 content words were used as dimensions. The co-occurrence counts were collected with a context window of ± 2 content words from each target word. The co-occurrence matrix was then weighted by Positive Pointwise Mutual Information (PPMI) (Evert, 2008). Singular Value Decomposition (SVD) (Deerwester et al., 1990) to 300 latent dimensions was run on our initial 30,000-dimension matrix. The variants were finally obtained by combining the adjective with each of the noun’s top 6 neighbors (e.g., *punto debole* \rightarrow *vantaggio debole*

‘weak advantage’, *termine debole* ‘weak end’, etc.), the noun with all the top 6 neighbors of the adjective (e.g., *punto debole* → *punto fragile* ‘fragile point’, *punto incerto* ‘uncertain point’, etc.) and finally all the top 6 neighbors of the adjective and the noun with each other (e.g., *punto debole* → *vantaggio fragile* ‘fragile advantage’, *termine incerto* ‘uncertain end’, etc.), ending up with 48 potential Linear DSM variants per target.

Structured DSM variants. While unstructured (i.e., window-based) DSMs just record the words that linearly precede or follow a target lemma when collecting co-occurrence counts, structured DSMs conceive co-occurrences as $\langle w_1, r, w_2 \rangle$ triples, where r represents the lexico-syntactic pattern or, like in our case, the parser-extracted dependency relation between w_1 and w_2 (Padó and Lapata, 2007; Baroni and Lenci, 2010). The grounding assumption of such models is that the syntactic relation linking the two words should act as a cue of their semantic relation (Grefenstette, 1994; Turney, 2006; Padó and Lapata, 2007). Actually, structured DSMs have been shown to perform competitively or better than linear DSMs in a variety of semantic tasks, like modeling similarity judgments or selectional preferences or detecting synonyms (Baroni and Lenci, 2010). Since we wanted to exploit different kinds of distributional information to generate our variants, following the method described in Baroni and Lenci (2010) we created a structured DSM from La Repubblica, where all the content words occurring more than 100 times were kept as targets and the co-occurrence matrix was once again weighted via PPMI and reduced to 300 latent dimensions. For each target, we generated 48 virtual lexical variants with the same procedure described for the window-based DSM variants.

iMWN variants. For each noun, we extracted the words occurring in the same synsets and its co-hyponyms from Italian MultiWordNet (iMWN). As for the adjectives, we experimented with two different approaches, extracting just their

synonyms in the first case (iMWN_{syn} variants) and adding also the antonyms in the second case (iMWN_{ant} variants). Since antonyms were not available in the Italian section of MultiWordNet, we had to translate them from the English WordNet (Fellbaum, 1998). For each noun and adjective, we kept its top 6 iMWN neighbors in terms of cosine similarity in the same DSM used to acquire the linear DSM variants. Once again, this method provided us with up to 48 potential iMWN_{syn} and 48 potential iMWN_{ant} variants per target.

2.6.3 Gold standard idiomaticity judgments

As in the previous experiments, we collected gold-standard 1-to-7 idiomaticity judgments for our 24 target AN phrases from 9 linguistics students (Figure 2.17). The mean idiomaticity rating given to each expression is reported in Table A.4 in the Appendix. The mean score given to our idioms was 6.07 (SD = 1.31), while the mean score given to compositional expressions was 1.72 (SD = 1.24). This difference was proven by a Wilcoxon signed-rank test to be statistically significant ($W = 11394$, $p < 0.001$). Inter-coder reliability, measured via Krippendorff’s α (Krippendorff, 2012), was 0.76.

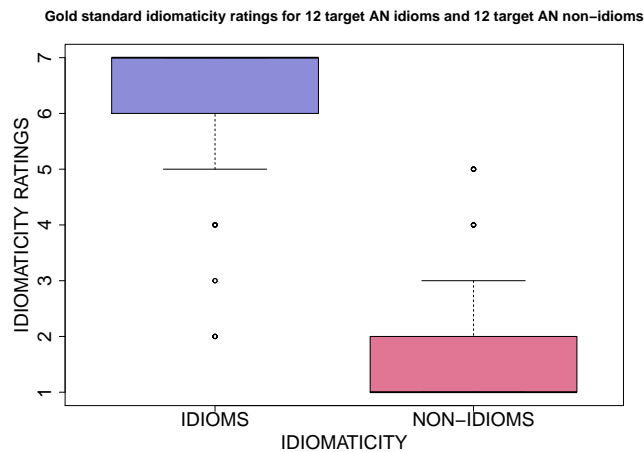


Figure 2.17: Boxplot of gold standard idiomaticity ratings given to the set of 12 target AN idioms and 12 target AN non-idioms.

Space	Total zero variants	Zero variants per target	
		Mean	SD
Linear DSM	727	30.29	11.32
Structured DSM	909	37.88	10.37
iMWN _{syn}	627	26.13	14.47
iMWN _{ant}	616	25.67	13.46

Table 2.6: Number of non-attested variants for each of the four DSM spaces built from Linear DSM, Structured DSM, iMWN_{syn} and iMWN_{ant} variants respectively.

2.6.4 Calculating compositionality indices

In this second experiment on AN constructions we compared our variant-based indices with traditional additive and multiplicative compositionality indices reported in the distributional literature. For every variant type (linear DSM, structured DSM, iMWN_{syn} and iMWN_{ant}) we built a DSM from itWaC representing the 24 targets and their variants as vectors. Co-occurrence statistics recorded how many times each target or variant construction occurred in the same sentence with each of the 30,000 top content words in the corpus. The matrices were then weighted with PPMI and reduced to 150 dimensions via SVD. Moving on to compositionality modeling, first off we computed the four Mean, Max, Min and Centroid measures we described in Section 2.4.1, both considering (*orth* models) and not considering (*no* models) the non-attested variants.

Table 2.6 reports how many variants were not attested in our corpus for each of the four spaces we built (Linear DSM, Structured DSM, iMWN_{syn} and iMWN_{ant}). As we can see, the issue of non-attested variants was an across-the-board phenomenon which involved each of the four space types and was only slightly smaller in iMWN-derived spaces.

Variant-based indices were compared against two of the measures described in Mitchell and Lapata (2010) and Krčmář et al. (2013). We trained a DSM on

itWaC that represented all the content words with token frequency > 300 and our 24 targets as row-vectors and the top 30,000 content words as contexts. The co-occurrence window was still the entire sentence and the weighting was still the PPMI. SVD was carried out to 300 final dimensions. Please note that the context vector of a given word did not include the co-occurrences of a target idiom or target compositional expression that was composed of that word (e.g. the vector for *punto* did not include the contexts of *punto debole*). We then computed the following measures:

Additive. The cosine similarity between a target vector and the vector resulting from the component-wise sum of the noun vector and adjective vector. This roughly corresponded to performing a weighted addition as explained in Section 2.6.1 with both weights set to 1, since in our assumption both component vectors equally contributed to the representation of the whole phrase.

Multiplicative. The cosine similarity between a target vector and the vector resulting from the component-wise product of the noun vector and adjective vector.

2.6.5 Results and Error Analysis

First and foremost, we must report that three idioms for every type of variants (Window-based DSM, Structured DSM and iMWN) obtained a 0.0 score for all the variant-based indices since no variants were found in itWaC. Nevertheless, we kept this information in our ranking as an immediate proof of the multiwordness and idiomaticity of such expressions. These were *punto debole*, *passo falso* ‘false step’ and *colpo basso* ‘cheap shot’ for the Structured DSM spaces, *punto debole*, *pecora nera* ‘black sheep’ and *faccia tosta* ‘cheek’ for the iMWN spaces and *punto debole* and *passo falso* for the Window-based DSM spaces.

In Table 2.7 we report once again the 5 models with the highest IAP, the highest F-measure at the median and the highest Spearman’s ρ correlation with the human ratings respectively. The compositionality score given to each expression by the model with the highest IAP and F-measure, the model with the highest Spearman’s correlation with the ratings and the non-variant-based Additive model is reported in Table A.4 in the Appendix.

Top IAP Models	IAP	F	ρ
iMWN _{syn} Centroid _{orth}	.88	.83	-.46*
Structured DSM Mean _{orth}	.87	.83	-.65***
Additive	.86	.75	-.62**
iMWN _{syn} Centroid _{no}	.85	.75	-.43*
iMWN _{ant} Centroid _{orth}	.83	.75	-.51*
Top F-measure Models	IAP	F	ρ
iMWN _{syn} Centroid _{orth}	.88	.83	-.46*
Structured DSM Mean _{orth}	.87	.83	-.65***
iWMN _{syn} Mean _{orth}	.79	.83	-.61**
Linear DSM Centroid _{orth}	.77	.83	-.46*
Additive	.86	.75	-.62**
Top ρ Models	IAP	F	ρ
Structured DSM Mean _{orth}	.87	.83	-.65***
Additive	.86	.75	-.62**
iWMN _{syn} Mean _{orth}	.79	.83	-.61**
iMWN _{ant} Mean _{orth}	.83	.75	-.61**
Linear DSM Mean _{orth}	.75	.75	-.61**
Baselines	IAP	F	ρ
Multiplicative	.58	.50	.03
Random	.55	.51	.05

Table 2.7: Best 5 models with 90 targets for IAP (top), F-measure at the median (middle) and Spearman’s ρ correlation with the speaker judgments (bottom) against the random baseline (* = $p < .05$, ** = $p < .01$, *** = $p < .001$). All the models use 48 variants per target.

First off, it is important to keep in mind that, differently from the previous experiment on VN constructions, here we are operating under conditions of data scarcity, with a far smaller dataset of 24 AN expressions. All in all, we can observe that our variant-based method proves reliable when applied to AN constructions

as well and that it performs quite comparably, or slightly better, to the Additive model. Multiplicative performed comparably to the Random baseline. Although at odds with Mitchell and Lapata’s (2010) results, such a scarce performance of the Multiplicative model is in line with the findings by Baroni and Zamparelli (2010) and Boleda et al. (2013), who both found Addition to be more effective in modeling AN compositionality. While Baroni and Zamparelli (2010) hypothesize that product-based indices could be disadvantaged by SVD, which can output negative dimensions and therefore lead to counterintuitive component-wise product results, Boleda et al. (2013) suggest that the feature union performed by addition could more accurately represent the semantics of AN structures with respect to the massive feature intersection provoked by multiplication, whereby shared dimensions are inflated and mutually exclusive ones are canceled out. Going back to our results, Centroid stands out again as the best performing measure in terms of ranking idioms before non-idioms (IAP) and in terms of precision-recall trade-off (F-measure) but this time together with Mean, in particular when used with variants extracted from a syntax-based DSM. Mean is also the compositionality measure that outputs scores that best align with how speakers perceive the idiomaticity of these expressions. Almost all the best models encoded non-occurring variants as orthogonal vectors, save $\text{iMWN}_{syn} \text{Centroid}_{no}$, therefore confirming that considering non-occurring evidence about the lexical flexibility of an expression results in a more reliable compositionality assessment. As for the source of the generated variants, we can see that a model using MultiWordNet-extracted synonyms ranks as the best model for IAP and F-measure and as the third best for ρ value, while a model using variants derived from a syntax-based DSM ranks as the second-best for IAP and F-measure and as the best for ρ . As we reasoned in Section 2.5.2, while on the one hand this suggests that both strategies for extracting lexical variants are effective, fully distributional models emerge *de facto* as the best ones overall, considering that a fully automatic variant extraction procedure

is way less time-consuming. On top of this, it appears that taking advantage of a syntax-enriched model that takes into account dependency relations between its targets and its dimensions (Structured DSM models) rather than relying on linear bag-of-word co-occurrence patterns (Linear DSM models) leads to a more accurate variant selection. Finally, including antonym-related information in the iMWN models does not seem to bring any additional advantage with respect to just considering synonym-related one.

In order to understand whether specific items in our dataset could be particularly troublesome for our algorithms, we carried out a qualitative analysis of the most common false positives and false negatives. As happened in the previous experiment, frequent false positives were compositional but collocation-like combinations like *gruppo numeroso* ‘large group’ or *crescita rapida* ‘rapid growth’, which contain nouns and adjectives that co-occur very often. On the other hand, while false negatives in our previous study mostly consisted in strongly ambiguous expressions liable to both a figurative and a literal reading according to the context, in this case they were evident idioms, like *testa calda* ‘hothead’ or *punto fermo* ‘fundamental point’ (lit. ‘still point’). To discover why our algorithms ended up classifying them as literals, we had a look at the lexical variants that were generated and were available for each of them. For *testa calda*, only 1 Structured DSM variant occurring just 1 time and 2 iMWN variants occurring 1 time were found in itWaC and this led to a skewed and not reliable compositionality assessment. As regards *punto fermo*, the variants that were generated, like *punto solido* ‘solid point’ or *passaggio chiaro* ‘clear step’ seem to refer to the same semantic field of the original expression and exhibited quite predictably a similar distribution.

2.7 Discussion

The purpose of this chapter was to investigate idiom lexical variability from a corpus-based standpoint, in order to understand whether devising compositionality indices that rest upon lexical fixedness is actually an effective strategy for automatically retrieving idioms in corpora. Psycholinguistic and corpus studies have brought out oftentimes that idioms feature a greater formal plasticity with respect to what has traditionally been maintained and that they are far from being frozen words-with-spaces (Gibbs et al., 1989a; McGlone et al., 1994; Moon, 1998; Glucksberg, 2001; Riehemann, 2001; Grant, 2005; Langlotz, 2006; Vo, 2011; Duffley, 2013; Torre, 2014). In her inspection of the Oxford Hector Pilot corpus, Moon (1998) finds plenty of instances of lexical variation in idioms, both involving verb components (e.g. *set/start the ball rolling*, *explode/blow up in one's face*) and noun components (e.g. *calm/lull before the storm*, *tempt fate/providence*), to the point of calling into question the very notion of canonical form. In their eye-tracking study, Geeraert et al. (2017a) find no significant difference between idioms in their canonical form and idioms in a lexical alternative form both at the level of the entire phrase and just focusing on the idiom final word. Idioms in this study are put at the end of an idiomatically biasing sentence. When collecting offline acceptability judgments on the same sentences (Geeraert et al., 2017b), lexical variants are nonetheless judged as less acceptable with respect to canonical forms, therefore showing that it is still sensible to tease apart an idiom typical form and its possible alternatives, although they are among the most accepted formal variations in comparison with partial forms or idiom blends. Interestingly, higher semantic transparency turns out to make them sound more natural (Gibbs et al. (1989a) report a similar effect for semantic analyzability). In his web-based investigation, Duffley (2013) proves formal plasticity to be possible also for traditionally non-decomposable and totally opaque idioms like *kick the bucket*. Once

we have established that idioms are not unmodifiable wholes, it still makes sense to ask ourselves whether such formal elasticity of idioms is anyway less frequent and systematic with respect to compositional language and if we can consequently leverage this difference to automatically tease apart non-compositional and compositional expressions in corpora.

A strand of computational research has previously paid attention to lexical fixedness as a clue to multiwordness and non-compositionality (Tapanainen et al., 1998; Lin, 1999; Pearce, 2001; Fazly et al., 2009; Ramisch et al., 2008b; Farahmand and Henderson, 2016), for instance by comparing the frequency of target expressions with the frequency of lexical variants of these expressions, generated by replacing their components with synonymous words (Lin, 1999; Fazly et al., 2009). In a similar fashion to what Bannard et al. (2003) do with verb-particle constructions, we have proposed a series of distributional-semantic compositionality indices that measure the similarity between the vector of a target expression with the vectors of its lexical variants. Idiom vectors were expected to be less similar to the vectors of their variants with respect to how similar non-idiom vectors were expected to be to their variant vectors. As Bannard et al. (2003) point out, a comparison that is only based on association strengths as in Lin (1999) seems more prone to detecting formal institutionalization rather than non-compositionality per se, given that also semantically compositional collocations are characterized by a considerable degree of lexical frozenness. While in these cases lexical replacement does not bring about a considerable meaning shift in most cases (e.g. *frying pan* vs *cooking pan*), the original meaning is mostly lost when substituting idiom components (e.g. *spill the beans* vs *drop the beans*). Accordingly, we put forth four compositionality indices, that measure respectively the Mean similarity between a target vector and its variant vectors, the maximum (Max) and the minimum (Min) similarities between a target vector and its variant vectors and finally the similarity between a target vector and the Centroid vector of its variants. Our indices are

tested both on a set of 90 Italian VN expressions (45 idioms + 45 non-idioms) and another smaller set of 24 Italian AN expressions (12 idioms + 12 non-idioms). All in all, our scores were proven to perform effectively and, as shown by results on the AN dataset, quite comparably to the addition-based index traditionally used in the distributional literature on compositionality (Mitchell and Lapata, 2010; Krčmář et al., 2013). Various parameter settings were experimented with when implementing our models. First off, we tried to generate our variants by extracting synonymous words both distributionally and from a hand-crafted resource like the Italian section of MultiWordNet (Pianta et al., 2002). In the first case, we used just a linear co-occurrence-based distributional space with the VN dataset and both a linear and a syntax-based space with the AN dataset, to assess if the different kind of distributional information employed to extract the synonymous words could affect the results. As regards variants generated from MultiWordNet, with the VN dataset we tried to filter the synonyms and co-hyponyms by frequency or by cosine similarity with the original word, while with the AN dataset we tried both to keep just synonyms and co-hyponyms and to include antonyms as well. Finally, for the VN dataset only we manipulated the number of variants per target that we kept (15, 24, 35 or 48), while for both datasets we also manipulated the way we dealt with variants that were not attested in our corpus, namely by simply ignoring them or by encoding them as vectors that were orthogonal to the vectors of their respective targets. A feature ablation analysis conducted on the VN models revealed that the measure used (Mean, Max, Min, Centroid) and the variant source and filter (DSM, $iMWN_{cos}$ and $iMWN_{freq}$) were the parameters that influence the most the performance of the various models, while the number of variants per target and the way of encoding non-occurring variants did not seem to be very influential. Models that used $iMWN$ variants were shown to perform comparably to models that generated variants distributionally. In particular, the second experiment on AN constructions revealed that

when such variants are extracted from a space that registers co-occurrences in a more structurally informed way by keeping track of dependency relations between targets and contexts, the performance is even better. We can therefore conclude that generating variants from a distributional space is the best strategy, since, the performance being equal, it is far less time-consuming and does not require to manually go through a lexical resource. Second, Centroid emerged as the best faring measure in the VN experiment, while both Mean and Centroid appeared to be the best ones in the AN experiment. Such a primacy makes sense in that both measures take into account the whole range of lexical variants that derive from a word combination and not just the most similar or the least similar one. As we have stated plenty of times, there are some idioms that allow for a certain degree of lexical manipulation, so considering just the most similar variants as in the Max measure would result in wrongly labeling some of the target phrases. Moreover, since these variants are automatically assembled, as a result some of them might be impossible word combinations that would never actually appear in language, so that a measure that just considers the least similar variants as Min would similarly lead to inaccurate compositionality assessment. It is therefore just looking at the whole set of possible lexical variants that a model can grasp the compositionality degree of a phrase in the most spot-on way.

As has been often stressed in the theoretical literature, automatic idiom type identification is vital to a variety of NLP tasks, from improving parsing efficiency, to performing cross-language information retrieval, information extraction and machine translation (Sag et al., 2002; Calzolari et al., 2002; Constant et al., 2017). In this chapter we have demonstrated that focusing on lexical fixedness is a sensible method to computationally distinguish between idiomatic and non-idiomatic constructions of varying syntactic structures, since the lexical variability displayed of idioms is still more restricted with respect to non-idiomatic units. In Chapter 3, we will switch our focus to the syntactic axis of idiom variation and we will adopt

a psycholinguistic perspective on the issue, in order to understand how idiom syntactic variants (in our case, the passive form) are actually processed in the mind of the speakers, to observe if such variants are actually more challenging to process than idiom canonical forms and which contextual and idiom-related factors are at play in facilitating or inhibiting this processing.

Chapter 3

Verb voice and word order in idiom comprehension: two eye-tracking studies

3.1 Introduction

In Chapter 2, we carried out a computational investigation of the lexical dimension of idiomatic variability. We started from the consideration that idioms are not so formally invariable as the first theoretical and psycholinguistic contributions have contended, and that many instances of lexical variations for idioms can be traced in corpora (Moon, 1998; Langlotz, 2006; Vo, 2011; Vietri, 2014) and easily processed in the presence of a supporting context (Geeraert et al., 2017a,b) or when the idiom at issue is semantically transparent or analyzable (Gibbs et al., 1989a). Nevertheless, given that the occurrence of such lexical variants is less frequent and systematic than in non-idiomatic language, we have seen that comparing the lexical fixedness of different expressions is a useful tool for conducting automatic idiom type identification and hence telling apart which of these expressions classify

as idiomatic and which do not. That said, while corpus research allows scholars to gain an insight into how linguistic phenomena are actually distributed in current language use, their comprehensiveness must not be taken for granted. It might still be the case that many expressions, especially figurative ones, are rather prerogatives of spoken language or that the corpus at hand is not properly balanced for textual genres. Accordingly, the absence or scarce frequency of a certain phenomenon must not be necessarily taken as a sign of its ungrammaticality (Vietri, 2014; Stone, 2016). Carrying out a psycholinguistic experiment lets the researcher employ *ad-hoc* crafted stimuli that may contain phenomena that are not often attested in corpora and makes it possible to understand how these potentially occurring phenomena are processed in the mind of the speakers. Our purpose for this chapter is therefore to concentrate upon another axis of idiom variability, i.e. the syntactic one, by adopting a psycholinguistic standpoint. We will present two eye-tracking experiments on Italian that will be aimed at observing how verb voice and word order interact in idiom comprehension. Since Italian syntax allows for both a passive structure with preverbal subject (e.g. *La corda è stata tagliata* ‘the rope was cut’) and a passive structure with postverbal subject (e.g. *È stata tagliata la corda* lit. ‘was cut the rope’), in the first experiment we investigated whether passive idioms in an idiomatically biasing context are overall processed more slowly than active ones and whether passive idioms with a postverbal subject are processed faster than passive idioms with a preverbal subject, given that the former preserves the canonical verb-noun order of the active form. Given some counterintuitive results of this first experiment, we will then move on to a second study that will make use of a more natural dialogical context to effectively set idioms in the first passive form against idioms in the second passive form. In the remaining part of this introductory paragraph, we will first go through previous theoretical and experimental evidence on passivization in idioms (Section 3.1.1), we will then briefly review existing experimental evidence on passive form pro-

cessing (Section 3.1.2) and we will then illustrate the research question we will try to answer in our two eye-tracking studies (Section 3.1.3).

3.1.1 Passivization in idioms

The long-date conception of idiomatic expressions as morphologically complex lexical items that bring into play processes similar to single-word lexical access (Bobrow and Bell, 1973; Swinney and Cutler, 1979) has *de facto* stressed their syntactic rigidity. While passivizing an idiom like *kick the bucket* as in *The bucket was kicked by John* seems to hinder a possible figurative reading of the string for most native English speakers, the passive sentence *The question was popped by John* seems more suitable for a non-compositional interpretation of *pop the question*. As already mentioned in Chapter 1, a first class of lexical specification models maintains that the transformational deficiencies displayed by each idiom are singularly specified in its lexical entry (Weinreich, 1969; Katz, 1973). Weinreich (1969), for example, posits features like [-Passive] to be specified in the lexical entry for an idiom that does not tolerate passivization. Katz's (1973) account predicts a feature [+Idiom] to be stipulated for each idiom subpart that blocks syntactic transformations. Chomsky (1980) suggests that in an idiom like *kick the bucket*, the verb *kick* requires the lexical complement *bucket*, rather than just the trace of it, at the Logical Form to determine the idiomatic reading (e.g. *kick the bucket = die* \neq *the bucket was kicked t*), while other idioms like *take care of* allow for indirect assignment of the idiomatic reading through trace (e.g. *good care was taken t of the orphans*). Crucially, in the transformational approach by Fraser (1970), idiom syntactic flexibility is not seen as idiosyncratic anymore but rather starts being conceived of as exhibiting a patterned behavior: as already described in Section 1.3, the author puts forth an implicational Frozenness Hierarchy divided into six levels, from L0, standing for utter fixedness, to L6, corresponding to unre-

stricted variability. Idioms assigned to a certain level permit operations specified at that level and at all the lower levels. Level L6 is occupied by non-idiomatic language only. Each idiom is hence marked with a lexical feature specifying the hierarchy level it occurs at:

- L6 - Unrestricted: non-idiomatic language;
- L5 - Reconstitution: action nominalization (e.g. *His laying down of the law to his daughter was effective*);
- L4 - Extraction: particle movement (e.g. *look up the information* vs *look the information up*), passivization (e.g. *The law was laid down by her father*), preposing of prepositional phrases (e.g. *On whom can we depend?*);
- L3 - Permutation: indirect object movement, particle movement in verb-particle-noun phrase idioms (e.g. *put some weight on* vs *put on some weight*), yes-no question transformation (e.g. *Has the cat got your tongue?*);
- L2 - Insertion: some cases of indirect object movement (e.g. *John read the class the riot act*);
- L1 - Adjunction: gerundive nominalization (e.g. *John's kicking the bucket was tragic*);
- L0 - Completely Frozen: e.g. *bleed one white, turn a deaf ear to*.

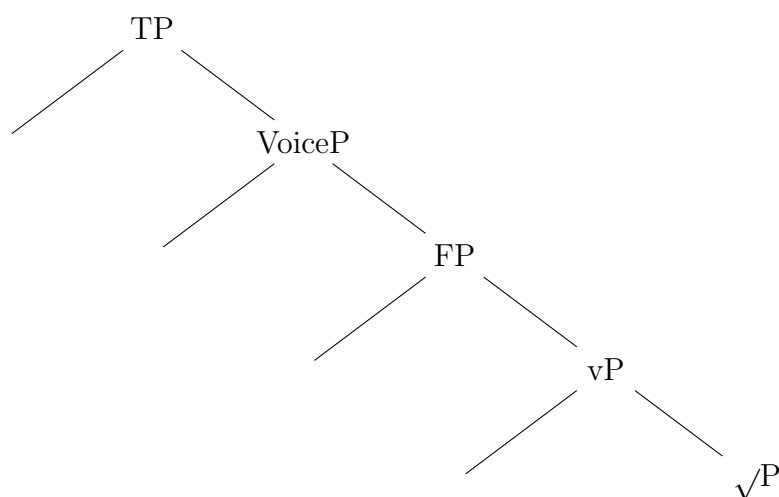
In Fraser's (1970) treatment, passivization is put in the fourth grade of the hierarchy and classified as an instance of extracion, given that it consists of the extraction of the object noun phrase to the subject noun phrase position. Accordingly, idioms that can freely undergo passivization can be targeted by permutation, insertion and adjunction as well. One of the main shortcomings of the approaches reviewed so far resides in their stipulative nature. Idioms are simply assigned a

lexical or structural feature or are assigned to a hierarchy level based on the authors' observations and without any other independent explanation of why it is so. Fraser's (1970) model has the merit of moving beyond an idiosyncratic viewpoint towards an approach that spots out some regularities in the syntactic behavior of idioms, but once again no principled reason is provided why the six levels are ordered this way. On top of this, corpus data do not seem to corroborate this patterned behavior of idiom syntax (Stone, 2016). A different view that gained momentum has more and more often brought out that the syntactic behavior of idioms can actually be predicted and explained based on their semantics (Chafe, 1968; Newmeyer, 1974; Nunberg, 1978; Bach, 1980; Wasow et al., 1983; Lakoff, 1987; Nunberg et al., 1994; Egan, 2008). The idiom decomposition hypothesis elaborated by Nunberg and colleagues (Nunberg, 1978; Wasow et al., 1983; Nunberg et al., 1994) claims that syntactic flexibility goes hand in hand with semantic analyzability (or decomposability), so a sentence like *The bucket was kicked by John* loses its idiomatic interpretation with respect to *The question was popped by John*, because in the former case the idiomatic meaning is assigned to the phrase as a whole, while in the latter there is some kind of analogical and isomorphic mapping between parts of the literal string and parts of the idiomatic meaning. In this idiom specifically, *pop* stands for 'suddenly utter' and *question* for 'marriage proposal'. Nunberg (1978) further articulates decomposable idioms into normally decomposable idioms like *pop the question* and abnormally decomposable ones like *make tracks* or *meet your maker*, where the relationship between the string subparts and the components of the idiomatic meaning is mediated by a conventional metaphor. While Nunberg (1978) underlines that passivization is viable for normally decomposable idioms only, Nunberg et al. (1994) seem to leave this more fine-grained distinction aside and just speak in terms of nondecomposable idiomatic phrases and decomposable idiomatically combining expressions, thus construing the syntactic flexibility issue in dichotomous terms rather than

as a continuum that implicates subset relations like Fraser (1970). Despite this neat decomposability-based prediction, Nunberg (1978) points out that general constraints on passivization still apply even to decomposable idioms. First of all, idioms seem to inherit the passivization properties of their verb: when *hit* means something like ‘win’ or ‘guess’, it is passivizable both in a compositional phrase (e.g. *The lucky number was hit*) and in an idiomatic one (e.g. *The jackpot was hit by the little old lady*), while when its meaning is similar to ‘affect’, passivization will not be licensed literally (e.g. *The Cross-Bronx was hit by the travelers at rush hour*) nor idiomatically (e.g. *The headlines were hit by the story the very next day*). To move on, co-reference is not licensed between the idiomatic object, which becomes the passive subject, and the *by*-agent (e.g. **John’s mind was made up by him*), nor can idioms with an indefinite object go passive (e.g. **Time was marked by John*). A similar binary view on flexibility is held by the pretense-based account by Egan (2008), according to which idiom subparts preserve their compositional semantic value in processing and comprehenders engage in a pretense dynamic whereby idiomatic sentences are assigned non-standard truth conditions. For instance, when hearing that *John kicked the bucket*, speakers will first process it compositionally and pretend that John has hit a can with his foot. Specific principles of generation will then kick in to state what has to actually go on for the literal content of the sentence to be fictional, namely John’s death. Idiom component words therefore provide listeners with a cue to initiate the relevant pretense. Crucially, Egan (2008) posits a distinction between ‘weakly unpredictable’ and ‘strongly unpredictable’ idioms, where the meaning of the former (e.g. *pull strings*) is easier to figure out through metaphorical processes with respect to the latter (e.g. *kick the bucket*). In light of this, weakly unpredictable idioms allow more variability in their form, since in their case it is less important to provide the listeners with all the required verbal cues in order to activate the relevant pretense. In any case, such variability is not unlimited, but is said to be justi-

fied only in those cases where it results in a communicative payoff. Nevertheless, as Stone (2016) points out, Egan (2008) does not specify what this payoff consists in, nor does he lay out exhaustive criteria for categorizing idioms into either class. On the experimental side, Gibbs and Nayak (1989) collect similarity ratings between idioms in five syntactic variants (present participle, adverb insertion, adjective insertion, passive and action nominalization) and their paraphrases and, in line with Nunberg et al. (1994), find normally decomposable altered idioms to be rated as more similar to their paraphrases than abnormally decomposable and nondecomposable altered idioms. Passive ratings are shown to be significantly lower than present participle and adverb insertion but not significantly different from the other variants. As much as these findings may sound convincing, we take issue with similarity judgments as a way to assess syntactic acceptability. On the one hand, as stated by Geeraert (2016), these ratings sound more likely to capture how interchangeable the idiomatic variant and the paraphrase are in the same context rather than how acceptable a given variant is. Plus, an idiom and its respective paraphrase are not perfectly similar even in the idiom canonical form, considering that, for instance, *kick the bucket* adds some emotive, rhetoric and discourse-related nuances to the meaning of the corresponding simplex verb *to die*. So, using a paraphrase does not turn out to be a solid touchstone in the first place. A merit of Gibbs and Nayak's (1989) discussion, though, is to re-frame semantic decomposability as a gradient phenomenon from fully decomposable to fully nondecomposable idioms. Tabossi et al. (2008) try and replicate the same study with four variants (adverb insertion, adjective insertion, passive, left dislocation). While passivization is still rated as significantly less acceptable than adverb insertion and not significantly different in acceptability with respect to the other variants, this time they find both nondecomposable and normally decomposable varied idioms to be more similar to their variants with respect to abnormally decomposable ones. On top of this, the replication studies both by

Tabossi et al. (2008) and Titone and Connine (1994b) show subjects to perform at chance when categorizing idioms as decomposable and nondecomposable and then as normally and abnormally decomposable. Importantly, the prediction that only decomposable idioms are flexible is also at odds with findings by Duffley (2013) and Vietri (2014), who in their web searches find typically nondecomposable idioms like *kick the bucket* and the Italian *tirare le cuoia* ‘to die’ (lit. ‘to pull the leathers’) to occur also in passive form. As we have already mentioned, another debated point is whether idiom syntactic flexibility (and specifically for our case, passive form viability) is an idiosyncratic phenomenon and the transformational possibilities of each idiom must then be specified in its lexical entry (cf. Weinreich 1969 and Katz 1973) or it obeys general syntactic principles of a given language. In this regard, Tabossi et al. (2009b) show that speakers can rate the syntactic acceptability of idioms they never encountered before comparably to speakers that already know them and also that general linguistic principles like the impossibility to passivize phrases containing bare noun objects are still valid for all the idioms in the dataset. Results obtained by Tabossi et al. (2009b) are thus inconsistent with lexical specification claims, including the superlemma hypothesis by Sprenger et al. (2006), which predicts that, since the transformational deficiencies of a given idiom are listed in its superlemma, previous exposure to that idiom is necessary for a speaker to judge its formal ductility. Further experimental evidence on the processing of passive idioms comes from Stone (2016), who tests out the structural requirement model of idiom flexibility (Folli and Harley, 2007; Punske and Stone, 2014) predicting that the amount of functional structure that is required to license the interpretation of an idiom determines which syntactic operation that idiom will be able to undergo. Let us consider the hierarchical organization of verbal functional structure:



According to the structural requirement model, idioms licensed at the VoiceP layer of functional structure disallow passivization (e.g. *the line was drawn*), associated with VoiceP, object incorporation (e.g. *line-drawing*), associated with FP, and nominal gerundization (e.g. *a drawing of the line*), associated with vP. Idioms that are fixed at the FP level and require both FP and vP to license their interpretation can undergo passivization but not incorporation or gerundization. Idioms requiring only vP allow passivization and incorporation but not gerundization and finally \sqrt{P} idioms are true root-plus-object idioms that have no requirements on functional structure and are liable to passivization, object incorporation and nominal gerundization. In a first experiment, Stone (2016) collects acceptability ratings to sentences containing idioms in active, passive and gerundization form. Active idioms are rated as more acceptable than passive idioms, but no significant difference in acceptability comes out between actives and gerunds nor between passive and gerunds. Crucially, no bimodal distribution takes shape out of the acceptability ratings on passive idioms, at odds with the more black-or-white division between passivizable and nonpassivizable idioms predicted by the structural requirement model. In a second self-paced reading study, Stone (2016) compares the reading time of active and passive idioms in a semantically congruent or incongruent context. What comes to the fore is a significant effect of congruency

but not of syntax on reading times. Once again, no bimodal distribution results from the reading times of passive idioms. In commenting her findings, the author pinpoints some shortcomings in the employed methodologies. On the one hand, when rating acceptability subjects admitted they sometimes did not pay much attention to the syntactic structure per se, especially in passives and gerunds, but rather considered how much the meaning of the target phrases matched the context. On the other hand, the self-paced reading study used the contextual part of the sentence as the area of interest rather than the part containing the idiom (e.g. in *Lucille bit the dust, and her family and friends were shocked and upset*, only the second part after the comma was taken as area of interest), so reading data did not really account for how long it took subjects to access the idiomatic meaning in the active or passive form. It might also be the case that the semantic congruency effect registered in the second part of the sentence overrode the syntax effect in the first part of the sentence. Moreover, trial number is not taken as a predictor in the analysis, so the author cannot conclude if a satiation or adaptation effect might have kicked in after a few trials to make the reading of passive forms smoother. Another tentative explanation is provided by Townsend and Bever's (2001) theory that "we understand everything twice". Accordingly, when subjects first go through a sentence, they might not engage in a full syntactic and semantic analysis but rather in a low-level one, where even a non-canonical syntactic form might not be identified as ungrammatical and unacceptable. A more fine-grained analysis of sentence structure and verb voice that could lead the subject to perceive the sentence as ungrammatical would, in the case, take place just in a subsequent step. Despite these controversial results obtained from psycholinguistic experiments, two corpus surveys conducted on Google Books (Lin et al., 2012) and the Corpus of Contemporary American English (COCA, Davies 2008) seem to confirm the subset behavior of passivization, incorporation and gerundization in idioms that is predicted by the structural requirement model: idioms occurring

in nominal gerundization also appear in object incorporation, and those occurring in object incorporation turn out to be passivizable as well.

3.1.2 Experimental evidence on passive form processing

Existing psycholinguistic evidence on passive structure processing seems to form an inconsistent and not straightforward picture. In Ferreira (2003), subjects are aurally presented with active and passive sentences and at the end of each one are requested to name out loud either the agent or the patient. Sentences are of three types: in the symmetric ones, the agent and patient argument can be swapped around ending up with a plausible arrangement in both cases (e.g. *the woman visited the man/the man visited the woman*); in the reversible but highly biased type, swapping around the two arguments is still possible but with one of the two arrangements resulting far more plausible than the other (e.g. *the dog bit the man/the man bit the dog*); finally, in the non-reversible type, when the two arguments switch places a semantically anomalous stimulus is created (e.g. *the mouse ate the cheese/the cheese ate the mouse*). Subjects turn out to have a harder time assigning correct thematic roles in passive sentences with respect to active ones for all three sentence types, especially with implausible sentences where thematic role assignment stands at odds with subjects' schematic knowledge (e.g. *the dog was bitten by the man vs the man was bitten by the dog*). A slowdown in reaction time is also registered for passive sentences. If considered together with previous related findings (Ferreira and Henderson, 1999; Christianson et al., 2001; Ferreira et al., 2001, 2002), the results obtained by Ferreira (2003) seem to confirm the *good-enough* theory of sentence processing whereby a mixture of simple heuristics, based on schematic knowledge and syntactic habits, and slower and more precise syntactic algorithms are at play in language comprehension. This two-tier model bears a strong resemblance to the Late Assignment of Syntax Theory by Townsend

and Bever (2001). In the case of passive processing, one of the most frequent and powerful heuristics predicted by good-enough theory is the agent-first one, which can be defined as the tendency to analyze the first NP in an English sentence as a proto-agent and the second one as a proto-patient, given that this is the most frequent argument order in the English language. Schematic knowledge can also play a role in this pseudo-parse when dealing with semantically implausible sentences. At this point, if algorithmic parsing is given enough time to kick in, go back over the best-guess heuristic and revise it, the comprehender will get to the correct interpretation of the sentence's syntax. Otherwise, the pseudo-parse heuristic can win over the algorithmic processing and the comprehender will be left with a gut-level good-enough representation of the sentence's meaning, hence identifying the first NP in the passive sentence as the agent and the second one as the patient. Considering that comprehension accuracy in passives in Ferreira (2003) is still high, though significantly lower than in actives, it follows that most of the time the good-enough representation is corrected, except for a small proportion of trials. An alternative frequentist and usage-based interpretation would make the case that the more we are exposed to a given construction, the more entrenched our cognitive representation of that construction will be, with an ensuing facilitation in processing (Langacker, 2000; Macdonald and Christiansen, 2001; Tomasello, 2003; Bybee, 2010; Johns and Jones, 2015). Usage-based views (the term was introduced by Langacker (1987)) hold that, rather than being fixed and *a priori*, cognitive representations for language are created and updated in an ongoing way by means of repeated exposure to language. As language users encounter a new utterance, they encode and categorize it according to phonetic form, meaning and context, matching these new representations by similarity to representations that already exist in their minds. Units such as syllables, morphemes, words, and syntactic constructions thus gradually take shape in the minds of the speakers out of specific communicative events and thanks to domain-general

processes like statistical learning, chunking and categorization (Bybee, 2010). If we stick to this account, passive sentences should take longer to process in light of their lower frequency with respect to active ones (Gordon and Chafetz, 1990). Nonetheless, this possibility seems to be ruled out if we consider that, in a second experiment, Ferreira (2003) observes no difference in comprehension accuracy between active sentences and far less frequent subject-cleft sentences using the same thematic role assignment task. When replicating the same task, Street and Dabrowska (2014) still observe passive sentences being processed slower than active ones in subjects with both high and low academic attainment, with low attainment subjects also making significantly more errors in passive sentences. According to two-stage processing models (Townsend and Bever, 2001; Ferreira, 2003), there should be a positive correlation between accuracy and reaction times. Since this is not the case and faster subjects in fact appear to be more accurate, the authors eventually discard a good-enough explanation of the results in favor of a usage-based one, considering also that low academic attainment participants, who are overall less exposed to written texts, are those who make more mistakes in comprehending passive sentences and in the English language such sentences are four to five times more frequent in writing than in speech (Roland et al., 2007). That passive structures entail greater processing complexity is also confirmed by neuroimaging data. Mack et al. (2013) discover that passives elicit greater activation in bilateral inferior frontal gyrus (IFG) and left temporo-occipital regions in a sentence-picture verification task. While left temporo-occipital cortex is responsible for thematic reanalysis, activation in the left and right IFG is connected with the processing of complex syntax and syntactic reanalysis respectively. Passive structure appears also to be acquired later in children (Borer and Wexler, 1987) and more hardly understood by aphasic patients (Grodzinsky, 2000). In addition to a good-enough and a usage-based explanation, a third syntactic hypothesis states that passive sentences derive from the movement of the theme (i.e.

the undergoer of the action) from the post-verbal direct object position, where it originates, to the grammatical subject position (Chomsky, 1980; Kiparsky, 2013). Specifically, these movement-based implications arise in generative grammar theories like Government and Binding (Chomsky, 1980). It follows that this additional syntactic dependency taxes the parser further and makes passives harder to process, in line with numerous studies pointing out that other noncanonical syntactic structures involving movement such as subject vs object relative clauses (Staub, 2010) or elliptical verb phrases (Garnham and Oakhill, 1987) bring on processing difficulties. Anyway, other linguistic theories like syntactically monostratal constructionist approaches (Hoffmann and Trousdale, 2013) and Lexical-Functional Grammar (Bresnan, 2001) dismiss the claim that passive involves movement and rather maintain that it is just a different construction which entails a different lexical and thematic structure with respect to the active form. In contrast to these predictions, a self-paced reading study by Carrithers (1989) comparing active and passive sentences reveals passives to be read faster than actives starting from the first NP that is encountered, while another contribution by Traxler et al. (2014) that uses the same methodology finds passives to be read numerically but not significantly faster than actives both at the level of the verb and of the object/*by-agent* NP. A visual world study of Kamide et al. (2003) does not show any processing cost to incur in passive sentences, nor any evidence in favor of an agent-first strategy, since, when participants are listening to the verb, looks on the *by-agent* object appear to be more frequent than looks on a Theme that would be compatible with the subject being the Agent. For instance, when listening to *The hare will be eaten by the fox* while looking at a picture with a fox, a hare and a cabbage, when it comes to the verb region there are more looks on the fox than on the cabbage, that would be a plausible theme in a hare-agent scenario like *The hare will eat the cabbage*. These data seem to contradict the agent-first pseudo-parse anticipated by good-enough theories (Townsend and Bever, 2001;

Ferreira, 2003). To shed some light on this observed discrepancy between online reading and offline comprehension results on passive processing, Paolazzi et al. (2019) collect both self-paced reading and offline comprehension data on active and passive sentences in a series of experiments. All in all, passives exhibit faster reading times and, at the same time, significantly more offline comprehension errors, especially with stative verbs and with thematic role assignment questions. On the one hand, a speed-up in passive reading times may tie in with expectation-based (Levy, 2008) and surprisal-based (Hale, 2001) accounts, considering that the availability of greater morphological cues in the passive can lead to increased expectations for the upcoming words. For instance, finding an auxiliary right after a subject NP makes a following verb more likely than a subject NP alone, as much as after a past participle followed by *by* we would expect a determiner much more than after seeing just a past participle alone. On the other hand, the fact that passives are more prone to errors in offline comprehension can be task-related and caused by a greater difficulty in keeping the memory representation of a passive sentence intact, as suggested by a significant correlation between working memory and active-passive accuracy difference.

3.1.3 Research question

All the theoretical and psycholinguistic studies on passivization and idiom passivization that we have reviewed thus far have been carried out on English. Crucially, English grammar licenses subject-verb as the only grammatical word order in the passive form, so that when switching from a declarative active form like *John kicked the bucket* to a passive variant like *The bucket was kicked by John*, both voice and surface word order are altered. Italian syntax allows for a passive construction with both a preverbal subject (43) and a postverbal subject (44).

(43) La corda è stata tagliata.

the rope is been cut

‘The rope has been cut’.

(44) È stata tagliata la corda.

is been cut the rope

‘The rope has been cut’.

While still being a passive, the second form preserves the surface verb-noun order of the active form (e.g. *Gianni ha tagliato la corda* ‘Gianni has cut the rope’). If, as predicted by two-tier good-enough processing models (Townsend and Bever, 2001; Ferreira, 2003), comprehenders do not always engage in a complete syntactic analysis of the linguistic input, but can sometimes stick to pseudo-parse heuristics driven by syntactic habits and word order-based generalizations, we can hypothesize that the processing of the second passive form will be smoother since speakers will encounter the idiom verb and the idiom noun in the same order as the canonical active form. By contrast, in the first form with preverbal subject, the verb and the noun components will be swapped around and therefore will make it harder for the speaker to identify the string as an idiom.

Subject-verb inversions and postverbal subjects can occur in a variety of languages (Bentley and Cruschina, 2018), ranging from Italian (Rizzi, 1982; Belletti, 2004; Belletti et al., 2007; Cardinaletti, 2018), to other Romance languages (Hulk and Pollock, 2001), Slavic languages (Erechko, 2002), English (Birner, 1994), Hebrew (Shlonsky, 1987) and Bantu languages (Demuth and Harford, 1999). In English the phenomenon appears way less frequent, systematic and felicitous than, for instance, in Italian and it is restricted to specific contexts, as when the logical subject shows up postverbally while other material that normally occurs postverbally is placed in clause-initial position (e.g. *Sitting in the garden was an old*

man), in order to put already given information ahead of newly conveyed one. Other instances of English inversion take place in formal writing after positive frequency, degree or manner adverb (e.g. *Bitterly did we repent our decision*), in certain American dialects after negation (e.g. *I know a way that can't nobody catch us*) or in colloquial English after locative adverbs (e.g. *Here comes the bus*, Green, 1981). When it comes to null-subject languages like Italian and other Romance languages, early analyses within the Principles and Parameters framework (Chomsky, 1980) have claimed that it is this very possibility to license a phonetically null pronominal element in preverbal subject position, without mandatorily producing an explicit subject (45b), to be the necessary condition for the availability of verb-subject structures in these languages (Rizzi, 1982).

- (45) a. Luca sta leggendo il giornale.
 ‘Luca is reading the newspaper’.
- b. Sta leggendo il giornale.
 ‘[(S)he] is reading the newspaper’.

Other works have anyway pointed out that the presence of verb-subject constructions also hinges upon discourse-related factors (Belletti, 2004; Cardinaletti, 2018). Postverbal subjects in Italian usually occur with intransitive verbs, where the lack of a direct object in the first place does not make the construction ambiguous or marked:

- (46) È arrivato il postino.
 is arrived the postman
 ‘The postman has arrived’.

Sometimes, going for a verb-subject structure is the unmarked and pragmatically appropriate way to answer a question by conveying new information:

- (47) a. Chi ha telefonato?
 who has called?
 ‘Who called?’
- b. Ha telefonato Gianni.
 has called Gianni
 ‘Gianni called’.

As we told above, verb-subject structure can also be applied to passives (48b):

- (48) a. Questa mattina un uomo è stato ucciso.
 this morning a man is been killed
 ‘A man was killed this morning.’
- b. Questa mattina è stato ucciso un uomo.
 this morning is been killed a man
 ‘A man was killed this morning’.

Within the generative framework, Bianchi (1993) classifies a set of 28 Italian verbal idioms on the basis of the syntactic movements they can undergo. As for passivization, she singles out a set of idioms that do not tolerate it, like *tagliare la corda* ‘to slip away’ (lit. ‘to cut the rope’), *ficcare il naso* ‘to stick one’s nose’ and *tirare le cuoia* ‘to pass away’ (lit. ‘to pull the leathers’) and others that do, like *fare gli onori di casa* ‘to welcome the guests’ (lit. ‘to make the home honors’), *fare progressi* ‘to make headway’ (lit. ‘to make progresses’) and *prendere l’iniziativa* ‘to take the initiative’. To motivate their different versatility, Bianchi (1993) notices that while the interpretation of the first group of idioms is totally noncompositional, in the second group the idiomatic meaning is partially predictable from the lexical meaning of the idiom subparts. Therefore, she argues that the NPs in the first group of non-passivizable idioms are not assigned a theta role by the verb and

are deleted as an autonomous syntactic category either via the application of an idiomatic rule that leaves an empty category or by being reanalyzed together with the verb as a complex verb. Crucially for our research question, Bianchi (1993) claims that if an idiom does not accept passivization with a preverbal subject (49a), neither will it accept passivization with a postverbal subject (49b):

- (49) a. *La corda è stata tagliata da Gianni.
the rope is been cut by Gianni
'The rope has been cut by Gianni (= Gianni slipped away).'
- b. *È stata tagliata la corda da Gianni.
is been cut the rope by Gianni
'The rope has been cut by Gianni (= Gianni slipped away).'

In generative syntax, passivization is an instance of A-movement, namely the movement of a phrase to a position that is assigned a theta-role (Chomsky, 1980). In this case, the direct object phrase is moved to subject position. Passive structures like (49b) could thus be seen as structures without overt A-movement. Bianchi (1993) actually motivates the parallelism in acceptability between preverbal-subject passives and postverbal-subject passives by arguing that the logical form of sentences like (49b) resembles the surface structure of sentences like (49a). By virtue of the Expletive Replacement principle (Chomsky, 1991), the expletive pronoun in clause-initial position (here null) lacks any semantic content and its presence at the logical form level is hence not legitimate. The postverbal subject forming a chain with the clause-initial preverbal expletive moves then to its position and replaces it. As we can see, in this framework preverbal-subject passives and postverbal-subject passives, despite their different surface word orders, classify both as instances of A-movement and are subject to the same acceptability restrictions.

In contrast to what is suggested by Bianchi’s (1993) theoretical account, some psycholinguistic evidence points to the fact that surface word order and constituent adjacency can actually help speakers to access and process the meaning of idiomatic expressions regardless of syntactic structure (Holsinger, 2013; Dörre and Smolka, 2016), in line with good-enough tenets whereby speakers sometimes do not initiate a full syntactic analysis of the input they receive and are rather left with a pseudo-parse based on shallow features like word order generalizations (Christianson et al., 2001; Ferreira, 2003). In a visual world eye-tracking experiment, Holsinger (2013) has subjects listening to idiomatic expressions in a Lexically Available or Lexically Unavailable condition with synonymic replacement (e.g. *kick the bucket* vs *kick the pail*) while looking at four words on a screen. One of the word is semantically related to the idiomatic meaning of the string (e.g. *death*), another is related to the literal meaning of the string (e.g. *foot*) and the remaining two are distractors (e.g. *triangle* and *animal*). Importantly, both Lexically Available and Unavailable idiomatic items are experienced in two types of sentences, namely in a Syntactically Available condition (e.g. *John kicked the bucket/the pail last Thursday*) or in a Syntactically Unavailable one, where the constituents are still placed in sequential order, but with a sentence boundary between the verb and the NP (e.g. *It was surprising to see someone as skilled as John completely miss the ball when he kicked. The bucket/the pail full of orange slices was destroyed when he accidentally missed the ball*). The purpose here is to test a basic prediction from the superlemma hypothesis (Sprenger et al., 2006). Accordingly, the idiom superlemma representation will hinder lexical activation from spreading from single lemmas (*kick, bucket*) to the conceptual layer where idiomatic meaning is accessed if the idiomatic string does not match a compatible syntactic configuration. Surprisingly, when subjects are exposed to the Lexically Available but Syntactically Unavailable condition (e.g. *...he kicked. The bucket...*), in the late time window comprised between 580 and 980 ms from the noun onset, looks to the

idiomatic associate (e.g. *death*) are significantly higher than looks to the averaged distractors (e.g. *triangle, animal*), while looks to the literal associate (e.g. *foot*) are just marginally higher. This result suggests that encountering the idiom components in their shallow canonical order is enough to activate an idiomatic reading irrespective of the syntactic structure. In two sentence completion tasks on German, Dörre and Smolka (2016) present subjects with idiomatic and literal active or passive sentences missing the final word and that can be completed by choosing between a literal associate word, an idiomatic associate word or a word with an unrelated meaning. Both reaction times and chosen words were registered. The authors find that active sentences are overall processed faster than passive ones, but interestingly that idiomatic passive sentences with adjacent constituents (50b and 51a) are processed faster idiomatic than passive sentences with non-adjacent constituents (50a and 51b).

- (50) a. Nach den Sternen/Bonbons wurde von ihr gegriffen.
 ‘She reached for the stars (= She tried to attain something difficult)/She reached for the sweets’.
- b. Ihm wurde/n von ihr der Kopf/die Haare gewaschen.
 ‘She washed his head (= She gave him a piece of her mind)/She washed his hair’.
- (51) a. Von ihr wurde nach den Sternen/Bonbons gegriffen.
 ‘She reached for the stars (= She tried to attain something difficult)/She reached for the sweets’.
- b. Der Kopf/die Haare wurde/n ihm von ihr gewaschen.
 ‘She washed his head (= She gave him a piece of her mind)/She washed his hair’.

While confirming that passivized idioms are more challenging to process, the evidence collected in this experiment anyway provides an additional proof that

preserving linear constituent adjacency makes such processing easier.

Analyzed collectively, the evidence reported by Holsinger (2013) and Dörre and Smolka (2016), together with the good-enough view advanced by Ferreira (2003), seems to suggest that a passive form with postverbal subject (e.g. *è stata tagliata la corda*) could actually enjoy a processing advantage over a passive form with preverbal subject (e.g. *la corda è stata tagliata*), since the former preserves the surface verb-noun order of the canonical active form. Two-stage processing models (Townsend and Bever, 2001; Ferreira, 2003) call into question the fact that subjects always get to a full-fledged syntactic analysis of the utterances they are exposed to and rather suggest they sometimes stay with a quick and dirty gut-level sentence representation. Hence, the surface order of the postverbal-subject passive could actually make the string more easily recognizable as an idiom. Contrariwise, what is maintained by Bianchi (1993) is that if one of the two passive forms is not suitable for a given idiom, neither is the other one. Most of the literature on idiom processing produced so far has taken English as its target language. In English, only passive forms with preverbal subjects are grammatical. Focusing on Italian postverbal-subject passives can help us figure out whether the core issue in processing passive idioms is verb voice per se or the violation of the canonical verb-noun order that in languages like English is the only viable option in the passive.

All things considered, we set out to investigate the following research questions with two eye movement studies:

- Are passive idioms actually longer to read, and thus more challenging to process, with respect to active idioms? Is passivization more disrupting for processing idioms than for processing compositional expressions?
- Are passive idioms with postverbal subject (e.g. *è stata tagliata la corda*)

faster to read, and thus less challenging to process, with respect to passive idioms with preverbal subjects (e.g. *la corda è stata tagliata*)? Again, does this apply to compositional expressions as well?

- What role do traditionally idiom-related variables like familiarity and semantic transparency have in the processing of idiom passive forms?

3.2 Eye-tracking research on idioms

Tracking eye movements during reading allows for getting a sound grasp of moment-to-moment language processing as it unfolds in the mind of the speakers (Rayner, 1998, 2009; Liversedge et al., 2011; Rayner, 2012). Similarly to other techniques like fMRI, EEG and MEG, eye-tracking makes it possible to acquire online and spontaneous data from subjects that are not aware of the linguistic phenomenon under investigation and are not engaging in any overt artificial task but are rather purely focused on comprehension. Stimuli are also more naturalistic than in lexical decision or naming studies in that they usually consist in sentences or passages and not in single words being sequentially displayed on a screen. Differently from techniques like fMRI and MEG though, eye-tracking does not return neuroanatomically located data, but rather evidence of a more indirect kind. As in studies involving reaction time measurement, one of the basic assumptions at the root of eye movement studies is that the amount of time spent fixating on a given stimulus is a reflection of its cognitive complexity. Other two basic premises are a principle of immediate or incremental processing as each word is read, and some degree of eye-mind correspondence, i.e. some equivalence between what is being looked at and what is being processed (Pickering et al., 2004; Carrol and Conklin, 2015). In the past decades, eye-tracking systems have become more easily available and user-friendly. The experimental setup basically boils down to

subjects sitting in front of a monitor, usually leaning on a chinrest, and silently reading sentences or passages that are sequentially displayed on a screen while performing some distractor task or answering comprehension questions. While subjects read sentences from the screen, gaze position is calculated with a given sampling rate (2 milliseconds in our case with the EyeLink® Portable Duo) by means of a corneal reflection system, wherein an algorithm detects the area and the center of the subject's pupil by relying on the number of black pixels inside the eye image and an infrared LED light is directed toward the eye generating a reflection on the cornea. The relative distance between pupil center and corneal reflection is then exploited to calculate gaze position. The basic components of eye movements include *fixations*, namely the period of time when the eyes remain fairly still and new information is acquired from the visual array, *saccades*, i.e. eye movements between fixations when no information is processed, and *regressions*, namely backward saccades that the subject does to reanalyze some parts of the previous context. For readers of English and other alphabetic systems, the average fixation duration is on the order of 225-250 ms, the average saccade is 7-9 letter long and regressions occur about 10-15% of the time for skilled readers (Rayner, 2009). The linguistic variables that most of all have an influence on fixations, saccades and regressions are length, frequency and predictability: the harder a text gets and the more long, infrequent and/or unpredictable words it contains, the longer fixations, the shorter saccades and the more frequent regressions will be (Balota et al., 1985; Rayner, 2009). Crucially, not every word is fixated during reading. Words that are highly frequent or highly predictable given the preceding context are often skipped. Carpenter and Just (1983) notice that readers fixate content words 85% of the time and function words just about 35% of the time. Such skipped words are usually pre-processed in the parafovea, given that the perceptual span, i.e. the amount of information extracted from a single fixation, is asymmetric and skewed to the right in alphabetical languages, consisting of about

3-4 characters to the left of a given fixation and 14-15 characters to the right of this fixation (Rayner et al., 1980; Rayner, 2009). One of the main assets of eye-tracking is the possibility to take advantage of both early and late processing measures. Early measures like first fixation duration or gaze duration (i.e. the total duration of all the fixations made on a given region until the region itself is left either to the left or to the right), reflect lexical access and early information integration. Late measures like total reading time (e.g. the total duration of all the fixations on a certain region, including regressions either from the left or the right) are instead representative of discourse integration and information reanalysis processes.

Eye-tracking has been used multiple times to investigate the reading of idiomatic expressions. Titone and Connine (1999) compare the per-character first pass fixation duration of ambiguous idioms and context regions in four different conditions, where the expressions were employed either figuratively (52a, 52b) or literally (52c, 52d) and either before (52b, 52d) or after (52a, 52c) a disambiguating context region:

- (52) a. She finally kicked the bucket after being ill for months.
- b. After being ill for months, she finally kicked the bucket.
- c. She finally kicked the bucket, forgetting to move it from the path.
- d. Forgetting to move it from the path, she finally kicked the bucket.

When idioms appear in sentence-final position, decomposable idioms are read faster than nondecomposable ones. However, no difference in reading speed is registered between decomposable and nondecomposable idioms when they appear in sentence-initial position. These findings point to a late-stage contribution of decomposability, when competing figurative and literal meanings must be integrated into a particular context, but seem to deny an early facilitating role of decom-

posability. Underwood et al. (2004) are the first to compare fixation count and fixation durations in the final word of idiomatic phrases and *ex-novo* literal phrases placed into text paragraphs (e.g. *policy* in *So as usual honesty is the best policy* vs *It seems that his policy of leaving things until the last minute...*) in both native and non-native speakers. In native speakers, idioms appear to enjoy a processing advantage over literals, with fewer and shorter fixations on their final component, while idiom advantage in non-native speakers just comes down to fewer fixations with no significant difference in fixation durations. The authors also underline that final words are sometimes skipped, though no more precise statistics as skipping probability are reported. The results obtained by Underwood et al. (2004) are discussed in view of the E-Z Reader model of eye movement control (Reichle et al., 1998; see Reichle et al., 2003 for an updated version), which comprises five stages:

1. Familiarity check - the orthographic form of the fixated word is identified, without full activation of the phonological and semantic form yet; this process is expedited by frequency;
2. Lexical access - the word lexical representation comes into contact with the visual input and the word becomes available for semantic and/or syntactic processing; this stage is sped up by frequency and context;
3. Early saccadic programming - in this stage, once familiarity check on the word at hand has been completed, attention can move to the following word while the eyes stay still on the current word; if familiarity check on the following word confirms it to be very familiar, the following word can actually be skipped;
4. Late saccadic programming - at this point saccadic movement cannot be modified and its execution is mandatory;

5. Saccadic movement.

In light of this model, when a conventional string like an idiom is being read, its final word can be skipped in case early saccadic programming on the penultimate word already signals the final word as familiar and thus unnecessary to fixate. Two major shortcomings of the study described so far are that syntactic structure is not held constant across conditions and that experimenters did not make sure that non-native speakers were actually in the know about the idioms they included in the dataset. Moving on to other contributions, Vainio and Nenonen (2006) track Finnish speakers when they read Finnish verb-object idioms and literal phrases composed of the same verbs and matched nouns. Their data point to the fact that no initial advantage comes out either for idioms or literals over each other and that idiom processing advantage is rather a delayed effect, with less rereading of idiom nouns in comparison with literal phrase nouns. Siyanova-Chanturia et al. (2011a) compare the reading time of idiomatic strings used figuratively (*at the end of the day* ‘eventually’), of the same strings used literally (*at the end of the day* ‘in the evening’) and of strings with a novel and matched final word (*at the end of the war*). The items are embedded into one-paragraph stories. In native speakers, no significant difference turns up in early measures (gaze duration), while late measures (total reading time) confirm the processing advantage of idiomatic strings, which therefore result not only to be read faster, but also to call for less reanalysis. Of note, idiomatic strings used figuratively are not read faster than idiomatic strings used compositionally. By contrast, non-native speakers do not read idiomatic strings faster than matched novel ones. Cieřlicka et al. (2014) analyze how English idioms are read by English-Spanish and Spanish-English bilinguals. In stimuli, items are used either literally or figuratively and are preceded by an either biasing or neutral context. The presence of a biasing context is shown to make the reading of idioms used figuratively faster for both

English-dominant and Spanish-dominant speakers in terms of total reading time, number of regressions and fixation count. As regards the impact of language dominance, total reading time for idiom region and post-idiom region is significantly shorter for English-dominant speakers. Generally speaking, although not consistently across all conditions, English-dominant subjects seem to exhibit a figurative meaning preference, while Spanish-dominant ones seem to privilege a literal reading of the idioms. This last finding is consistent with both the Graded Salience Hypothesis by Giora (1997), according to which salient and more readily available meanings of figurative expressions are accessed and processed first, and with previous literature suggesting that less proficient L2 speakers seem to go for a literal interpretation of figurative expressions first (Abel, 2003). Another eye-tracking study by Carrol et al. (2016) examines how native and non-native (L1 Swedish) English speakers read English idioms, Swedish idioms translated into English and congruent idioms, namely idioms that exist in both languages. Swedish speakers read both translated Swedish idioms and congruent idioms faster than literal controls, while no difference is found between English idioms and literal controls. English speakers, as predicted by previous literature, turn out to read English idioms and congruent idioms faster than literals, while Swedish idioms result more disruptive to read because English native speakers predictably have a harder time making sense of them. Carrol and Conklin (2017) track native English and native Chinese speakers reading English idioms, English controls, Chinese idioms translated into English and Chinese controls translated into English. Controls consist in the same idiom strings with matched final words. English idioms are again read faster than controls by English speakers in terms of total reading times and skipping rates on the final word, but not in early measures. Chinese speakers show no facilitation of English idioms with respect to controls. When it comes to translated Chinese idioms and controls, English speakers exhibit no difference between the two groups. Chinese speakers take less to read the final word of idioms

with respect to controls, but exhibit no difference at phrase-level. When English and Chinese speakers are then compared in a second experiment with English and translated Chinese idioms used in literal or figurative contexts, English speakers read idioms equally quickly in both contexts, but have a harder time with Chinese idioms in figurative contexts than in literal ones. For both English and Chinese idioms, Chinese speakers read the literal versions of phrases more quickly than the figurative versions. Geeraert et al. (2017a) are the first ones to use eye-tracking to compare how different idiomatic variants are read. In the study, readers are presented with idioms placed at the end of literally or idiomatically biasing sentences and appearing in:

1. their canonical form (e.g. *Although these were new stocks, they suddenly went through the roof.*);
2. their literal sense (e.g. *While the guys were reshingling, they suddenly went through the roof.*);
3. a lexically varied form (e.g. *Although these were new stocks, they suddenly went through the ceiling.*);
4. a partial form with a component replaced by a pronoun (e.g. *Although these were new stocks, they suddenly went through it.*);
5. a form with an integrated concept, as with adjectival modification (e.g. *Although these were new stocks, they suddenly went through the investment roof.*);
6. a form that results from blending two different idioms (e.g. *Although these were new stocks, they suddenly went through the charts.*).

The purpose of their investigation is to figure out whether speakers have a harder time reading idiomatic variants with respect to the canonical form of the

idioms and if some variants are more challenging to process than others. Quite interestingly, what comes to the fore is that variants are not always more disruptive to read than canonical forms. In fact, lexical variants, idiom blends and idioms used in the literal meaning are not read longer than the canonical form. Longer fixations are registered on the altered words of the idioms, but this does not affect reading times on the whole idiom regions. Predictably, idioms with integrated concepts take longer to read than both the canonical form and the other variants, given the presence of an additional word, while partial forms are quicker to go over, being them shorter than the canonical forms. On top of that, lexical variants seem to require comparable reading times to idiom blends, probably because they are as long as the canonical forms and because they partially preserve the original idiomatic meaning. Not all the idioms are anyway affected by formal variation in the same way. Generally speaking, subjects are facilitated in reading idiom variants by increased knowledge and familiarity with the idioms at issue and by a general accepting attitude toward violations of canonical prescriptive grammar rules, as assessed by the authors with a survey. Finally, in a recent contribution Titone et al. (2019) test English native speakers while they read English idioms followed by an idiomatically-biasing context (Id-Id, e.g. *Ruby had a lark when she switched her family's sugar to salt as a joke*), the same idioms followed by a literal disambiguating context (Id-Lit, e.g. *Ruby had a lark when she was a child but now wanted a parrot instead*) and literal non-idiomatic phrases followed by a literal context (Lit-Lit, e.g. *Ruby saw a lark at the pet store and thought that it was very beautiful*). Their aim is to suss out which role wholesale meaning retrieval and word-by-word compositional analysis play in idiom processing and at which processing stage they kick in. Of note, their study also takes into account the influence of both familiarity and semantic decomposability on idiom online comprehension. Early measures suggest a direct retrieval process to take place before subjects get to the disambiguating region, in that idioms are overall read

faster than literal control phrases, without a significant effect of decomposability or familiarity. This data tie in with the hypothesis that the idiomatic form can be accessed before the phrase-final word, as proposed by Cacciari and Tabossi (1988) and Titone and Connine (1994b). When it comes to first pass reading time of the disambiguating region, idioms in a figurative context and literals in a literal context are read with equal speed, while a slowdown is detected for idioms embedded into a literal disambiguating context, probably because speakers initially commit to the figurative interpretation of an ambiguous idioms and then have to revise their prediction and reanalyze the meaning of the sentence. Quite predictably, this disruption is intensified when the idiom is highly familiar. On the other hand, the difference between the Id-Id and the Id-Lit condition becomes smaller for highly decomposable idioms. Such interfering effect of decomposability, which stands in clear contrast to the claims of purely compositional models (Gibbs and Nayak, 1989; Gibbs et al., 1989a), brings about some competition between the literal and the figurative meaning of the expression and thus slows down the processing of the disambiguating region in the Id-Id condition while speeding it up in the Id-Lit condition. As regards idiom total reading time, the Id-Id condition was facilitated with respect to the Lit-Lit one by high familiarity and low decomposability, consistently with the findings on the disambiguating region. All in all, the results suggest that idioms are initially processed via direct meaning retrieval, while a word-by-word compositional analysis can come into play when one of the two competing literal and figurative meanings is selected and integrated into the sentence context. Therefore, the data obtained by Titone et al. (2019) back up a hybrid or multidetermined view on idiom processing (Cacciari and Tabossi, 1988; Titone and Connine, 1994b; Libben and Titone, 2008; Sprenger et al., 2006; Titone and Libben, 2014), where both direct meaning retrieval and compositional processing are at play. In particular, if an idiom is highly familiar, speakers will be likely to access it as a whole without engaging in the compositional process,

which in turn will be required by less familiar idioms.

3.3 Experiment 1

3.3.1 Method

Participants

Forty-three students at the Scuola Normale Superiore of Pisa and at the University of Pisa (26 females, mean age = 24.36, age range = 20-31) took part in the first eye-tracking experiment. All subjects were native speakers of Italian, had normal or corrected-to-normal vision, reported no reading or other language-related disorders and were all unaware of the research question being investigated. All participants gave written consent prior to their participation. The study was approved by the Scuola Normale Superiore Ethics Committee.

Materials

160 Italian idioms composed of a verb, an article and a direct object (e.g. *tagliare la corda* ‘to slip away’ lit. ‘to cut the rope’, *gettare la spugna* ‘to throw in the towel’ lit. ‘to throw the sponge’) were selected from a dictionary of Italian idioms (Quartu, 1993). Idioms composed of a verb plus a bare-noun direct object like *voltare pagina* ‘to turn the page’ (lit ‘to turn page’) were left out because of the ungrammaticality of the resulting passive form, with a bare count noun as a subject (**Pagina è stata voltata* ‘Page was turned’). Familiarity and meaning knowledge judgments were first collected for our initial set of 160 idioms. Familiarity has been shown to be more a more comprehensive measure than printed-word frequency (Gernsbacher, 1984). Existing evidence also suggests that familiar idioms are

read faster (Schweigert, 1986) and are judged to be meaningful faster (Tabossi et al., 2009a). 30 Italian native speakers (13 females, mean age = 24.77, age range = 20-29) that did not take part in the eye-tracking experiment were presented with a list of our idiomatic expressions and were first of all asked to rate on a 1-7 Likert scale how frequently they had met these expressions both in written and spoken Italian, even if they were not sure about their meaning, with 1 standing for ‘Never’ and 7 standing for ‘Very often’. After they had filled in this first part, they were asked to go back over the list and paraphrase the meaning of each idiom. More precisely, our initial set of 160 idioms was split into 2 lists of 80 idioms, each of which was rated by 15 speakers. Our idioms received an average familiarity score of 5.27 (SD = 1.22), with *battere le calcagna* ‘to flee’ (lit. ‘to beat the heels’) obtaining the lowest average ratings (1.87) and *mettere le corna* ‘to cheat (on someone)’ (lit. ‘to put the horns (on someone)’) and *rompere le scatole* ‘to bother (someone)’ (lit. ‘to smash up the boxes (to someone)’) obtaining the highest average rating (7). To arrive at the final set of idioms to be used for the eye-tracking experiment, we first of all kept all the idioms with an average familiarity score ≥ 3.5 to make sure the participants actually knew the expressions they were going to read. In order to avoid subjects being primed by verbs or nouns appearing more than once during the experiment and to make all the items independent from one another, we made sure that the final subset of idioms we chose did not share the same verbs or nouns as much as possible. For instance, we did not keep both *perdere la testa* ‘to lose one’s head’ and *montare la testa* ‘to make someone get a big head’ (lit. ‘to mount the head (to someone)’), because they share the same noun, or both *perdere la testa* and *perdere il treno* ‘to miss the boat’ (lit. ‘to miss the train’), since they share the same verb, but we just kept *montare la testa*. The only exception in the final dataset are the two idioms *tagliare la corda* and *tirare la corda* ‘to take things too far’ (lit. ‘to pull the rope’) which share the noun *corda* ‘rope’. In our experiment, we aimed at comparing

the reading times of the active condition, the preverbal-subject condition and the postverbal-subject condition of both idiomatic and literal expressions, in order to understand if passivization is indeed more disruptive for idioms with respect to compositional expressions in processing. Crucially, to create the literal condition, not all the idioms in our dataset were semantically ambiguous: some of them had no literal meaning (e.g. *mozzare il fiato* ‘to take (someone’s) breath away’ lit. ‘to cut off the breath (to someone)’). In such cases, it would have been impossible to craft a plausible literal context. Therefore, in order to have the literal condition, we paired each idiom with a compositional expression formed by the same idiom verb and a different noun that was matched for character length (± 1 character) and for the integer of the frequency logarithm with the idiom noun. For instance, the literal condition for the idiom *tagliare la corda* was *tagliare la barba* ‘to shave the beard’, where the noun *barba* ‘beard’ was length- and frequency-matched with *corda* ‘rope’. We automatically extracted matched nouns for our idiom nouns from the itWaC corpus (1.9B tokens, Baroni et al., 2009) and we only kept those idioms for which we could find a plausible literal match. The selection procedure described so far left us with 60 idioms, which had a mean familiarity rating of 5.71 (SD = 0.96, range = 3.877) and were correctly paraphrased by subjects 88.43% of the times on average (SD = 18.49%). One idiom was actually never paraphrased correctly, namely *saltare il fosso* ‘to make a life-changing decision’ (lit. ‘to jump the ditch’), although it received an average familiarity score of 4.07. The speakers were probably familiar with the string even though they were not sure about its meaning or they thought it meant something different than the right definition. Anyway for the remainder most idioms were paraphrased correctly by subjects, with 32 idioms being assigned the right meaning 100% of the times. Since *saltare il fosso* did not stand out as an outlier in our data, we eventually decided to leave it in the analyses of the reading times. The list of 60 idioms and their literal matches, together with their English translation, can be found in Table B.1 in the

Appendix, while their average normative ratings can be found in Table B.2 in the Appendix.

The 60 idioms were then embedded into the 6 experimental conditions, namely Active, preverbal-subject passive (Passive I henceforth) and postverbal-subject passive (Passive II henceforth) in both the idiomatic and the literal condition, thus ending up with 360 sentences:

Active
<p>a. <i>A quanto so, Giorgio <u>ha tagliato la corda</u> perchè la festa era diventata noiosa.</i> ‘As far as I know, Giorgio slipped away (lit. cut the rope) since the party had got boring’.</p> <p>b. <i>Su mio consiglio, Giorgio <u>ha tagliato la barba</u> in vista del colloquio di lavoro.</i> ‘Following my advice, Giorgio trimmed his beard (lit. cut the beard) for the job interview’.</p>
Passive I
<p>a. <i>A quanto so, la corda è stata tagliata da Giorgio perchè la festa era diventata noiosa.</i> ‘As far as I know, the rope was cut by Giorgio since the party had got boring’.</p> <p>b. <i>Su mio consiglio, la barba è stata tagliata da Giorgio in vista del colloquio di lavoro.</i> ‘Following my advice, the beard was trimmed by Giorgio for the job interview’.</p>
Passive II
<p>a. <i>A quanto so, è stata tagliata la corda da Giorgio perchè la festa era diventata noiosa.</i> ‘As far as I know, lit. was cut the rope by Giorgio since the party had got boring’.</p> <p>b. <i>Su mio consiglio, è stata tagliata la barba da Giorgio in vista del colloquio di lavoro.</i> ‘Following my advice, lit. was trimmed the beard by Giorgio for the job interview’.</p>

Table 3.1: Experimental conditions (a. = idiomatic, b. = literal)

The complete list of sentences can be found in Table B.4 in the Appendix; note that we translated passivized idioms literally, since some of their figurative meaning were not transitive and could not be passivized in English. All the sentences in each condition shared the same structure. First and foremost, we carefully crafted the stimuli in order not to have the idiom area right at the beginning or at the end of a sentence, which could have spoiled our reading data. While the eyes need some time to land and adjust on the correct position at the beginning of a sentence, wrap-up effects can occur at the end of a sentence,

whereby target words at the end of a clause or sentence are fixated longer than when they are in sentence-internal position (Just and Carpenter, 1980; Rayner et al., 1989; Warren et al., 2009). Subjects probably need this additional time to integrate the information collected so far in the clause, which suggests that single clauses may act as processing units. Consequently, if an idiom were to be placed in sentence-initial or sentence-final position, it would be hard to tell, for instance, if a longer fixation time on the idiom region is due to the idiomatic status of the phrase per se or just to the phrase position. Our solution consisted in putting a three-word preamble at the beginning of each sentence (e.g. *A quanto so* ‘as much as I know’). The subject was always an Italian proper noun (e.g. *Giorgio*), while the idiom verb was inflected in the Italian present perfect (*passato prossimo*) so that the lexical part of the verb (excluding the auxiliary) had the same length across the three conditions (e.g. active *ha tagliato*, passive I and II *è stata tagliata*). If the verb had been inflected in the *passato remoto*, it would have been shorter in the active condition (e.g. active *tagliò* vs passive I and II *è stata tagliata*). The final part of the sentence provided the disambiguating context which made the figurative or literal meaning of the target phrase clear and also allowed for taking spillover effects into account. Passive I and Passive II sentences had basically the same structure except for the agent appearing in a *by*-phrase right after the idiom region. All in all, we kept character length (spaces included) for each sentence between 118 and 133. This guaranteed that each stimulus, being displayed in a 15-point monospaced yellow Monaco font with three characters roughly subtending one degree of visual arc, stayed within a single line of the screen. At this point, we collected naturalness ratings for our 360 experimental sentences from other 60 Italian native speakers that did not participate in the eye-tracking part (39 females, mean age = 24.33, age range = 20-30). Our sentences were split into 6 counterbalanced lists of 60 sentences each, so that each item appeared in just one of the six conditions per list (Idiom-Active, Literal-Active, Idiom-Passive I,

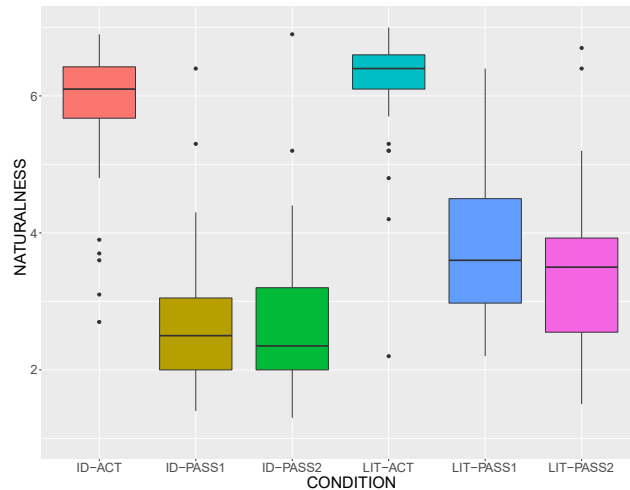


Figure 3.1: Boxplot of naturalness ratings given to the 360 stimuli in the 6 experimental conditions (experiment 1).

Literal-Passive I, Idiom-Passive II, Literal-Passive II). Each rater was presented with one of the 6 lists and asked to rate on a 1-7 Likert scale how natural and plausible each sentence sounded to them. Each sentence was thus judged by 10 speakers.

The average naturalness rating for each item in each condition is reported in Table B.3 in the Appendix. The boxplot of the naturalness ratings is depicted in Figure 3.1. A two-way ANOVA revealed a significant main effect of idiomaticity [$F(1,59) = 44.17, p < .001$], with idiomatic sentences being overall rated as less natural than literal ones, and syntax [$F(2,118) = 456.83, p < .001$], and a significant idiomaticity \times syntax interaction [$F(2,118) = 5.66, p < .001$]. Bonferroni-adjusted post-hoc pairwise comparisons with Wilcoxon signed rank test showed Active sentences to be rated as significantly more natural than Passive I and Passive II sentences ($p < .001$ in both cases), but returned no significant difference between naturalness in Passive I and Passive II. Cloze probability was then measured for our stimuli. For each stimulus, we created a first condition with the sentence being cut off before the first idiom content word (w1), namely the participle in the Active and Passive II condition and the noun in the Passive I condition, and

a second condition with the sentence being cut off before the second idiom content word (w2), namely the noun in the Active and Passive II condition and the verb participle in the Passive I condition, therefore ending up with 12 different conditions and 720 incomplete sentence stimuli in total:

1. **Idiom-Active-w1:** *A quanto so, Giorgio ha...*
2. **Idiom-Active-w2:** *A quanto so, Giorgio ha tagliato la...*
3. **Literal-Active-w1:** *A quanto so, Giorgio ha...*
4. **Literal-Active-w2:** *A quanto so, Giorgio ha tagliato la...*
5. **Idiom-Passive I-w1:** *A quanto so, la corda...*
6. **Idiom-Passive I-w2:** *A quanto so, la corda è stata...*
7. **Literal-Passive I-w1:** *A quanto so, la barba...*
8. **Literal-Passive I-w2:** *A quanto so, la barba è stata...*
9. **Idiom-Passive II-w1:** *A quanto so, è stata...*
10. **Idiom-Passive II-w2:** *A quanto so, è stata tagliata la...*
11. **Literal-Passive II-w1:** *A quanto so, è stata...*
12. **Literal-Passive II-w2:** *A quanto so, è stata tagliata la...*

12 counterbalanced lists of 60 incomplete sentence stimuli each were created. Each subject was presented with one of the list and asked to complete the sentences with the first meaningful words that came to mind. 120 Italian native speakers (99 females, mean age = 25.93, age range = 19-60) that were not tested in the eye-tracking part of the study and did not fill in any of the other surveys gave

Condition	w1 (Mean)	w1 (SD)	w2 (Mean)	w2 (SD)
Idiom-Active	0.50%	2.20%	32.67%	29.45%
Literal-Active	0.67%	3.12%	6.66%	11.88%
Idiom-Passive I	0%	0%	12.17%	13.30%
Literal-Passive I	0.67%	2.52%	6%	18.69%
Idiom-Passive II	0.50%	2.87%	20%	26.03%
Literal-Passive II	0.50%	2.20%	4.83%	10.33%

Table 3.2: Mean and SD of the cloze probability for the 6 experimental conditions at the w1 and w2 cutoffs.

cloze probability ratings to our materials. Each list was then completed by 10 raters.

The average cloze rating for each item in each condition is reported in Table B.3 in the Appendix. Since most of the mean cloze ratings for the w1 condition were close to 0, a boxplot visualization would not be so effective as with the naturalness ratings. We rather present the mean cloze ratings (and their SD) given to each of the six experimental conditions at the two cutoffs (w1 and w2) in Table 3.2. A two-way ANOVA on the w1 cloze ratings showed no significant effect of idiomaticity [$F(1,59) = 1.48, p = .23$] and syntax [$F(2,118) = 0.36, p = .70$]. At such an early stage, subjects lacked any possible useful contextual information that could have helped them recognizing the target idioms or literals. Moving on to w2 cloze data, a two-way ANOVA revealed a significant main effect of idiomaticity [$F(1,59) = 41.23, p < .001$], with idioms being recognized more frequently than literals probably by virtue of their conventional status, and syntax [$F(2,118) = 12.60, p < .001$] and their interaction [$F(2,118) = 13.52, p < .001$]. Bonferroni-corrected pairwise comparisons via Wilcoxon signed rank test only revealed Idiom-Active sentences to be more predictable than Idiom-Passive I sentences ($p < .001$) and Idiom-Active sentences to be more predictable also than Idiom-Passive II ones ($p < .01$). The final ratings we gathered were semantic transparency ones. As previously discussed, the notion of semantic transparency and motivation in idioms has been

declined in a variety of ways in the idiom literature that cannot always be clearly distinguished from one another. First off, there is the Fregean concept of pure compositionality, which indicates the extent to which the meaning of a complex expression stems from the combination of the meanings of its subparts and of the syntactic relationship that holds them (Frege, 1892; Partee, 1995). Referring to idioms specifically, Nunberg and colleagues (Nunberg, 1978; Nunberg et al., 1994; Wasow et al., 1983), together with Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a), express themselves in terms of analogical decomposability between parts of the literal strings and parts of the idiomatic meaning (e.g. *pull the strings* is decomposable in that *pull* metaphorically stands for *exploit* and *strings* stand for *personal connections*), while Libben and Titone (2008) for instance more generally refer to global decomposability as the extent to which idiom components make an independent contribution to the idiomatic meaning, without explicitly mentioning an analogical mapping. In her dissertation, Geeraert (2016) sticks to a broader-sense semantic transparency by simply asking subjects how clear and obvious the meaning of an idiom is. In collecting our judgments, we opted for this broad-sense semantic transparency in light of the consideration that even in some cases where an analogical mapping is not feasible, the meaning of some idioms is still somehow obvious and can be easily traced back from the literal meaning of the string. Instances of this might be *andare all'altare* 'to get married' (lit. 'to go to the altar'), *alzare la voce* 'to raise one's voice' and *allungare il muso* 'to have a long face' (lit. 'to stretch the snout'), where it is all in all clear why these three strings mean what they do but still their meanings cannot be analogically distributed among their component words in any sensible way. For example, it is clear why someone who is getting married would be described as going to the altar, but we cannot reasonably map part of the meaning 'to get married' to *andare* and part to *altare*. We thus prepared two lists of 30 idioms each and gave them to other 20 Italian native speakers in total (10 females, mean age = 24.25,

age range = 20-31). Each subject was presented with an idiom list and asked to evaluate the extent to which the idiomatic and the literal meaning of each idiom were related. Each idiom was rated 10 times. Our 60 idioms obtained an average transparency ratings of 4.39 (SD = 1.33), with *rompere le scatole* being rated as the least transparent one (1.4) and *raggiungere il traguardo* ‘to reach to the finish line’ being rated as the most transparent (6.9).

At this point, some considerations are needed regarding our 60 idioms sample. We saw that, starting from the original set of 160 verb-determiner-noun idioms, specific criteria had to be met for each expression to make it to our final set. First of all, idioms had to be all more or less familiar to speakers, so we just kept those reporting an average familiarity score ≥ 3.5 . Second, we had to keep those idioms for which we could find a sensible literal match based on corpus-driven frequency and character length of the noun. Third, we had to avoid as much as possible to keep idioms that shared the same verb or noun to make all the items independent from one another. This selectional procedure left us with 60 idioms. Since we had six experimental conditions and had to present stimuli according to a Latin-square design, where every participant saw each idiom once in one of the six conditions, we would have created six versions of the experiment, each one containing 10 idioms per conditions. To increase the number of items per condition that each participant saw and to reduce the number of subjects we needed, we decided to split our initial 2x3 design (Idiom vs Literal x Active vs Passive I vs Passive II) into two experiments with a 2x2 design (Idiom vs Literal x Active vs Passive I; Idiom vs Literal x Active vs Passive II). Each of the two versions was composed of 4 counterbalanced lists of 60 experimental sentences each plus 100 filler sentences containing a variety of syntactic and semantic phenomena that were different from the experimental manipulations. The 60 experimental sentences contained 15 items per condition (first version: 15 Idiom-Active, 15 Literal-Active, 15 Idiom-Passive I, 15 Literal-Passive I; second version: 15 Idiom-

Active, 15 Literal-Active, 15 Idiom-Passive II, 15 Literal-Passive II) and each item appeared in just one of the conditions per list. The 100 filler sentences were inserted to make sure that subjects did not guess what the experimental manipulations being tested were and so that idiomatic sentences would make less than 20% of all the sentences. In this way we made sure that subjects would not notice the presence of idiomatic expressions in the material and end up developing idiom-specific processing strategies. These 100 fillers consisted in:

- **10 semantic anomalies** - e.g. *Essendo molto assetato, Enrico ha bevuto un sorso d'acqua dalla radio che si trovava dietro il televisore in cucina.* 'Being very thirsty, Enrico drank a sip of water from the radio behind the TV set in the kitchen'.
- **10 syntactic anomalies** - e.g. *Davvero a malincuore Mario hanno abbandonato il lavoro dopo anni di carriera, essendo ormai arrivato il momento della pensione.* 'On great sufferance, Mario quit (3rd person plural verb) their job after years spent working, since the moment of his retirement had come by now'.
- **20 indirect interrogatives** - e.g. *Tutti si chiedevano se Fabio avesse iniziato un corso di cucina, dato che il marito lo considera da sempre un pessimo cuoco.* 'Everybody was wondering if Fabio had started a cooking class, considering that his husband has always regarded him as a very bad cook'.
- **20 cleft sentences** - e.g. *È Mirella che qualche giorno fa ha distrutto la macchina facendo un incidente frontale in autostrada all'uscita da Torino.* 'It is Mirella who a few days ago destroyed her car in a head-on crash on the highway right outside Turin'.

- **20 literal active sentences** - e.g. *A dirla tutta, Sara ha scelto un lavoro che non è adatto alle sue qualità, fidandosi dei consigli insensati del marito.* ‘In fact, Sara chose a job that is not tailored to her skills, trusting some dumb advice from her husband’.
- **20 literal passive sentences (10 passive I + 10 passive II)** - e.g. *Come ogni weekend, è stato organizzato un aperitivo da Franco con la sua ragazza e i suoi amici prima delle vacanze estive.* ‘As every weekend, a pre-dinner drink has been organized by Franco with his girlfriend and his friends before summer vacation’.

3.3.2 Procedure

Eye movements were recorded using an EyeLink[®] Portable Duo eye-tracker interfaced with a desktop PC. This model has a 500 Hz sampling rate. The experiment was assembled via the SR Research Experiment Builder software. Subjects sat 50 cm from the monitor, leaning on a chinrest, and their right eye was tracked. Stimuli were displayed on a 24-inch widescreen LCD Monitor. Sentences appeared on a single line in 15-point Monaco yellow font on a black background. Three characters roughly subtended one degree of visual arc. Subjects were randomly assigned to one of the two versions of the experiments (Active vs Passive I and Active vs Passive II) and to one of the four lists in either version and instructed to silently read for comprehension the sentences that sequentially appeared on the screen. Each list was divided into 4 blocks of 40 sentences each with a short pause after the second block. Each block started with three practice sentences. Subjects were calibrated using a 9-point grid before every block. At the beginning of each trial, participants made the sentence appear by fixating a yellow box on the left of the screen, then they silently read the sentence and pressed a button on a gamepad to go to the next trial. A fixation dot was displayed at the center

of the screen between trials. To make certain that participants were attentive throughout the experiment and were actually reading all the sentences, yes/no comprehension questions were randomly shown after a quarter of the trials. The experiment lasted about 45 minutes.

3.3.3 Results

Two participants scored below 80% in the comprehension questions and were discarded from the analysis, leaving us with 41 subjects (20 in the Active-Passive I version and 21 in the Active-Passive II version). Remaining participants showed no difficulty in understanding stimuli sentences, with an average comprehension score of 91.52%. Reading data were first of all cleaned by means of the 4-step procedure of the EyeLink[®] Data Viewer software. Fixations shorter than 80 ms and within one character of the previous or following fixation were merged with this neighboring fixation. Remaining fixations shorter than 80 ms or longer than 1000 ms were then deleted.

Our analysis of the reading data was carried out at two levels of granularity. At the first level, both idiomatic and literal phrases were taken into account to observe how both the idiomaticity and the verb voice of a phrase can affect its reading time at once. At the second level, we zoomed in on idioms only to analyze more closely the effects of idiom-related variables traditionally investigated in the literature, like familiarity, semantic transparency, meaning knowledge and cloze probability, on the processing of idiom passivization. In choosing the Areas of Interest (AOIs) whose reading times would have to be modeled, we followed the strategy proposed by Carrol and Conklin (2015) for analyzing eye movements on critical regions spanning larger than single words, and used both the whole phrase regions (e.g. *la corda è stata tagliata* in the idiomatic Active I condition in Table 3.3.1) and the phrase final words (e.g. *tagliata* in the same condition). On the

one hand, the final word of an idiom is the predicted locus of facilitation, where the speaker should recognize the string as a conventional multiword unit. On the other hand, taking the whole phrase area into account allows for observing the reading and re-reading time of the whole string and helps in those cases where the final word is skipped, probably due to its predictability and frequency, and so the multiwordness effect is just visible at the level of the whole string. When we had to compare the reading times for the whole phrase regions between the Active and the Passive I and II condition, we had to deal with fact that passive phrases contained an additional auxiliary verb with respect to the active ones and so the regions were of different length (e.g. *ha tagliato la corda*, 4 words, vs *la corda è stata tagliata/è stata tagliata la corda*, 5 words). A viable solution that came to mind was to focus just on the content words, namely the verb participle and the noun, so as to have two target words in each condition. In fact, a downside of this solution was that we would have run the risk of missing information coming from fixations on the auxiliary verbs, where the speakers could have undergone some parafoveal processing of the idiom content words. Table 3.3 reports the skipping rate of the auxiliary verbs *ha* (3rd singular)/*hanno* (3rd plural) in the Active form, the first auxiliary *è* (3rd singular) /*sono* (3rd plural) in Passive I and II form and the second auxiliary *stato* (masculine singular)/*stata* (feminine singular)/*stati* (masculine plural)/*state* (feminine plural) in Passive I and II form. Auxiliary verbs were skipped nearly half of the times in the Active condition, while they were skipped far less often in the Passive condition, considering also that verbs inflected in the passive have one additional auxiliary form. We therefore decided not to exclude fixations on the auxiliary verbs from the analysis and instead added the length of each ROI as a covariate in the statistical models.

One of the main assets of the eye-tracking methodology consists in the possibility to extract both early and late reading measures. While early measures reflect lexical access and very early semantic integration, late measures are more of a bell-

Condition	ha/hanno	è/sono	stato/-a/-i/-e
Idiom-Active	52.85%	-	-
Literal-Active	50.73%	-	-
Idiom-Passive I	-	31%	35.67%
Literal-Passive I	-	28%	26.33%
Idiom-Passive II	-	28.34%	27.71%
Literal-Passive II	-	24.13%	27.94%

Table 3.3: Skipping rates for the auxiliary verbs across the six conditions.

wether of information reanalysis and discourse integration (Siyanova-Chanturia, 2013). As early measures, we took into account first fixation duration (the amount of time spent fixating a single region for the first time) and first pass reading time (the total duration of all fixations in a region of interest before the eye leaves it either to the left or to the right). Go-past time was taken as in between an early and a late measure and it is calculated as the sum of all fixations from the first time a region is entered until it is left to the right, including regressive fixations to the preceding context. As a late measure we took total reading time, namely the sum of all fixations on a given region, regressions included. We finally modeled the number of fixations on a given region.

For each dependent variable, a linear mixed-effects model was fit to the data using the `lme4` package (Bates, 2010) in R (R Core Team, 2015). Idiomaticity was inserted in the models as a two-level categorical variable (Idiom vs Literal) and coded specifying custom contrasts to -0.5 (Literal) and 0.5 (Idiom). Syntax was inserted as a three-level categorical variable (Active vs Passive I vs Passive II) and coded specifying two different contrasts, first setting the Active (-2/3) against the Passives conditions (1/3, 1/3) and then contrasting Passive I (-0.5) to Passive II (0.5). Familiarity and transparency ratings were mean-centered, while continuous reading measures were log-transformed. For fixation count, generalized linear models using the Poisson distribution were fitted. To select the random structure for our models, we started off with a simple model predicting log-transformed total

reading time from Idiomaticity, Syntax and their interactions. We started from a maximal random structure including by-item and by-subject random slopes for Idiomaticity, Syntax and their interaction so as to keep our models as conservative as possible and decrease Type I error probability (Barr et al., 2013). We then proceeded to remove one random effect at a time and to compare each new model to the previous one with likelihood ratio tests to see if excluding a certain effect changed our model significantly. Our final choice consisted in keeping a by-subject random intercept and by-item random slopes for Idiomaticity, Syntax and their interaction. Predictors included in the fixed effects structure were Trial Number, to account for fatigue or adaptation effects, AOI Length, since as we previously saw the Active and Passive conditions differed in length, Cloze probability of the second content word, to see whether a difference in reading times between idioms and literals in the active and passive form was found over and above the higher transitional probabilities exhibited by idioms by virtue of their conventionality, and finally our experimental conditions (Idiomaticity and Syntax) together with their interaction. The coefficients of the fixed effects and random effect structures of all the models we ran are reported in the Appendix C.

After considering both idioms and literals, we zoomed in on the idiomatic condition only to assess how Familiarity, Meaning Knowledge and Semantic Transparency affected its reading time across different verb voices. A backward step-by-step model selection was carried out starting from a full model whose fixed effects contained Trial, AOI Length and Cloze probability as potential covariates, Familiarity, Meaning Knowledge and Transparency normative ratings, the Syntax condition and its interactions with the three normative scores. In the random structure we specified a by-subject intercept, a by-item intercept and a by-item Syntax random slope. We then proceeded to discard one non-significant predictor at a time, starting from the one with the lowest t-score. Each new model was then set against the previous one by means of a likelihood ratio test to make certain

that dropping the predictor did not change the model significantly. If removing an additional predictor resulted in a significant change from the previous model, we kept that last model as the best one. As concerns potential collinearity between the normative predictors, only Familiarity and Meaning Knowledge turned out to be significantly correlated ($\rho = .66^{***}$), but not Familiarity and Transparency ($\rho = -.006$) nor Meaning Knowledge and Transparency ($\rho = .168$).

All phrases (idioms and literals) - Final word

As claimed by Carrol and Conklin (2015), the final word of a multiword phrase should be the point where the subject actually recognizes the string as having multiword status and where a facilitation effect should therefore kick in. In fact, pinning down recognition point in idiomatic expressions is not always straightforward (Cacciari and Tabossi, 1988), especially in longer idioms. Since we just selected verb-determiner-noun idioms, we can roughly assume that idiom recognition for the items in our dataset would mostly take place after the subject has read both constituents. An exception could be represented for some speakers by the idiom *battere la fiacca* ‘to slack off’ (lit. ‘to beat the weariness’), where the term *fiacca* ‘weariness’ mostly occurs inside this idiom in Italian and so it bears some degree of selectional restriction. In any case, the only condition where the subject would see *fiacca* before the verb and could hence anticipate the other constituent is the Passive I one, which we already know to be less predictable and canonical than the Active one (cf. Table 3.2). In this first part of the analysis we thus focused on the reading times of the final word of both idiomatic and literal phrases. This final word was the noun in the Active and in the Passive II condition and the verb in the Passive I condition. As regards potential covariates, we saw a task adaptation effect to occur in total reading time and fixation count, with Trial Number as a significant predictor, signaling that the further the subjects

went into the experiment, the less time they spent reading and re-reading the final word of a phrase and the fewer fixations they made on it. AOI Length was significant in all the reading measures, with longer words being quite predictably fixated on longer. Similarly, a facilitating effect of Cloze probability showed up already in early reading measures (first fixation duration and first pass reading time) and persisted in late measures (total reading time). Moving on to the target experimental conditions, we did not find a significant effect of Idiomaticity in any measure. Considering the Syntax variable, we found that Passive forms were initially read faster than the Active, but Passive II received longer first fixations than Passive I. Passive II also brought about longer reanalysis of the previous sentence context with respect to Passive I (go-past time). All in all, the final word of Passive forms underwent longer re-reading and reanalysis resulting in significantly longer total reading time with respect to the Active, while the final word of Passive II elicited a longer total reading time with respect to Passive I. Passive forms also received significantly more fixations.

All phrases (idioms and literals) as AOIs

Focusing just on the reading time of the final word is not an effective strategy to comprehensively account for the processing of idiomatic phrases in that the final word of very predictable sequences can be skipped (Siyanova-Chanturia, 2013; Cacciari, 2014; Carrol and Conklin, 2015). Considering also the phrase as a whole as an area of interest allows for analyzing the reading and re-reading pattern of both the idiomatic constituents. The same task adaptation effect seen on the phrase-final word turns up in the whole phrase region as well, with a significant negative effect of Trial number on the go-past time, on the total reading time and on the fixation count. Longer phrases were read slower across all measures save first fixation duration, while Cloze probability was never found to have a facilitating

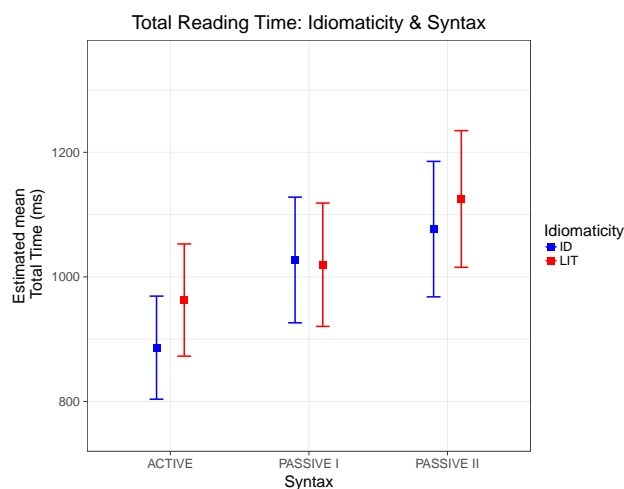


Figure 3.2: Estimated mean total reading time for idiomatic and literal phrases in Active, Passive I and Passive II condition for the entire phrase region.

effect. In line with previous results (Underwood et al., 2004; Siyanova-Chanturia et al., 2011a; Geeraert et al., 2017a), idiomatic expressions were found to be read overall faster than literals in go-past time and total reading time. This means that, although no evidence of facilitation appeared right when the subjects' eyes reached the phrase region in first fixation duration and first pass, subjects took less time exiting the phrase area before reaching the disambiguating context and then re-reading it after the following context part had been reached. An advantage for Active forms over Passive ones appeared in late measures (total reading time) and in terms of fixation count. On top of this, at odds with our predictions, Passive II elicited a significantly longer total reading time and a marginally significant increase in fixation count ($t = 1.875, p = .61$) with respect to Passive I.

A significant interaction between Idiomaticity and Syntax appeared in total reading time and fixation count. Plot 3.2 depicts the estimated mean total reading time for idiomatic and literal phrases in the Active, Passive I and Passive II condition. Pairwise contrasts were further explored with the `lsmeans` package (Lenth et al., 2016). While we already saw that Passive was more challenging to process than Active and that Passive II was in particular longer to read than

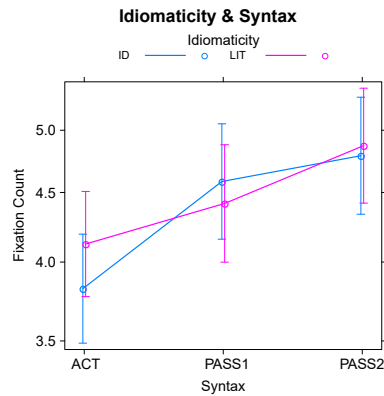


Figure 3.3: Idiomatcity \times Syntax interaction in fixation count for the entire phrase region.

Passive I, we found an idiom advantage in the Active (estimate = -85.19 ms, $t = 3.70$, $p < .001$), but no significant difference between idioms and literals in Passive I (estimate = 5.06 ms, $t < 1$, $p = .876$) and in Passive II (estimate = -40.80 ms, $t = -1.2$, $p = .236$).

The same situation is mirrored in the Idiomatcity \times Syntax interaction in fixation count (Figure 3.3). Idioms received significantly fewer fixations than literals in the Active (estimate = $-.300$, $z = -2.311$, $p = .021$) but not in Passive I (estimate = $.167$, $z = .990$, $p = .322$) and Passive II (estimate = $-.082$, $z = -.463$, $p = .644$).

Idioms only as AOIs

When modeling first fixation duration, the backward selection procedure left us with a final model containing no significant idiom-related variables, so the results we will discuss concern first pass reading time, go-past time, total reading time and fixation count. Once again, a significant negative effect of Trial number emerged in go-past time, total reading time and fixation count, while longer idioms elicited longer reading times in all measures and more fixations. A significant main effect of Syntax in all the reading measures confirmed that Passive idioms were read slower and fixated more often than Active idioms, but no significant difference

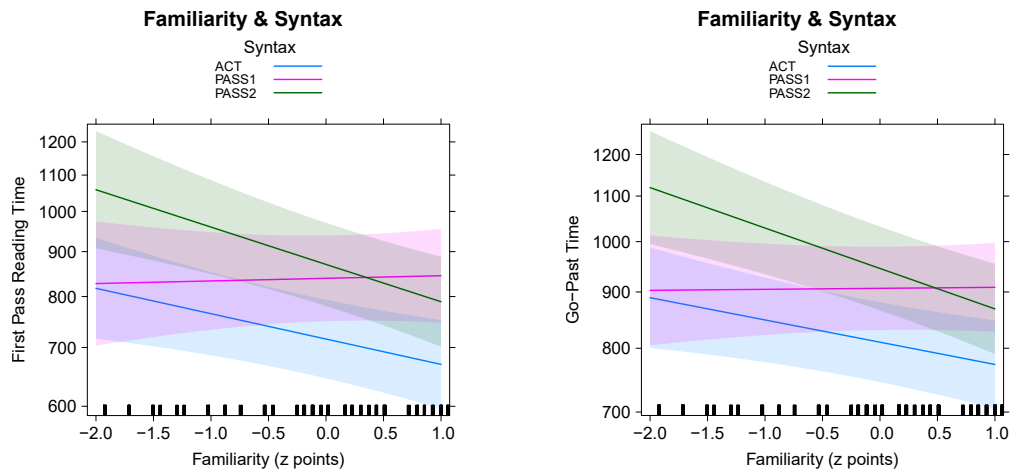


Figure 3.4: Familiarity \times Syntax interactions in first pass reading time and go-past time for the idiom phrase region.

between Passive I and Passive II was found.

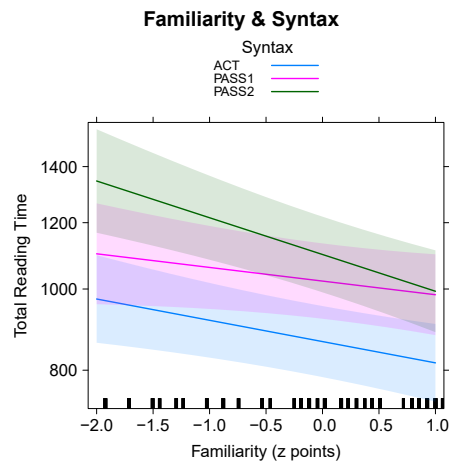


Figure 3.5: Familiarity \times Syntax interaction in total reading time for the idiom phrase region.

As regards the effects of idiom-related variables, a significant Familiarity \times Syntax (Passive II vs Passive I) interaction emerged in first pass reading time, go-past time and total reading time (Figures 3.4 and 3.5), signaling that Familiarity affected the reading times of Passive I and Passive II differently. While increased Familiarity seems to speed up the reading of the Active and Passive II forms in both early and late processing, Passive I initially appears to be insensitive to Familiarity, with some facilitation showing up in total reading time.

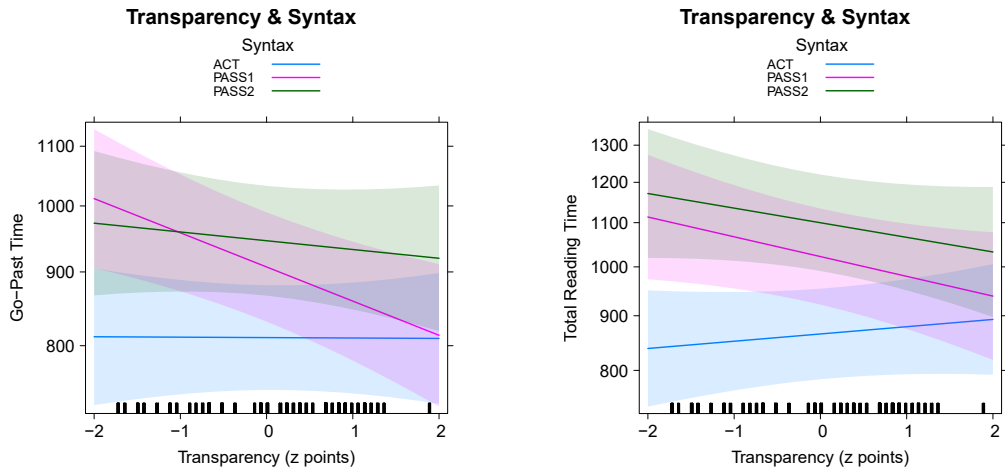


Figure 3.6: Transparency \times Syntax interactions in go-past time and total reading time for the idiom phrase region.

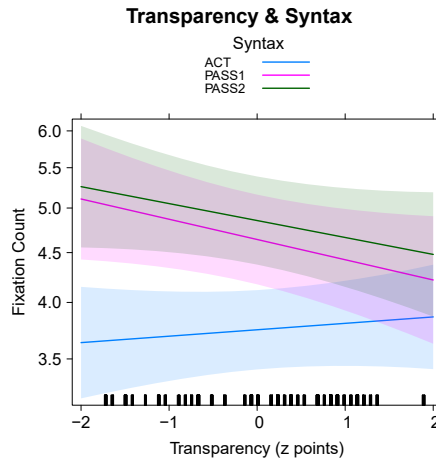


Figure 3.7: Transparency \times Syntax interaction in fixation count for the idiom phrase region.

A significant Transparency \times Syntax (Passive vs Active) interaction emerged in go-past time, total reading time and fixation count. While when the eyes of the reader had not reached the disambiguating region yet the only condition to be to be strongly facilitated by Transparency was Passive I, once subjects had read the entire sentence both Passive I and Passive II took less to re-read and reanalyze with high Transparency, while the Active condition was penalized by increasing Transparency. The same pattern was found for fixation count: the higher Transparency, the fewer the fixations made on Passive I and Passive II condition and the more the fixations made on the Active condition.

3.3.4 Discussion

As illustrated in Section 3.1.3, this eye-tracking experiment first of all set out to verify if passive idioms actually take longer to read than active idioms and if passivization is more disrupting in terms of processing for noncompositional expressions with respect to compositional ones. Second, we hypothesized that the long debated recalcitrance of idioms to passivization might be due to the canonical verb-noun order of the active citation form being swapped around in passive in languages like English, where most of the idiom literature has been produced. Since Italian syntax allows for a passive structure with postverbal subject, which keeps the verb and the noun in the canonical order they have in the active citation form, and since both good-enough theories (Ferreira et al., 2002) and other previous idiom-related evidence (Holsinger, 2013; Dörre and Smolka, 2016) suggest that speakers do not always commit to a full-fledged syntactic analysis of the utterance they are exposed to but are sometimes guided by linear order and adjacency of the constituents, we intended to investigate if this postverbal-subject passive form enjoyed some processing advantage over the preverbal-subject passive form. The results we obtained in this first experiment point to the fact that passive verb-determiner-noun phrases are harder to read and process with respect to active ones, but no significant difference came to the fore between passive idiomatic phrases and passive literal phrases. The greater difficulty in reading and processing passive structures that we detected is in line with previous comprehension and thematic role assignment experiments on passive constructions (Ferreira, 2003; Street and Dabrowska, 2014), which highlight that subjects have a harder time figuring out the semantics of passives, as well as with fMRI evidence reporting increased activation patterns for passive structures (Mack et al., 2013) and acquisition studies suggesting that passives are acquired later (Borer and Wexler, 1987). On the other hand, it stands at odds with previous self-paced reading studies (Car-

rithers, 1989; Traxler et al., 2014; Paolazzi et al., 2019) reporting faster reading times for passives over actives. In light of this facilitation in reading for passive sentences, Paolazzi et al. (2019) support a surprisal- (Hale, 2001) and expectation-based (Levy, 2008) account, whereby richer morphological clues (e.g. auxiliaries) in the passive should guide the readers towards expecting a passive form, with no disruption but actually some facilitation in reading time. By contrast, more frequent comprehension errors would be a working memory-related issue, brought about by a greater difficulty in keeping the memory representation for the passive sentence intact. Despite all this, it is still possible that the artificial nature of our stimuli, comprising one-line passive sentences presented sequentially and out of context, played a role in making passive processing more time-consuming. At any rate, it goes without saying that not finding a significant difference in processing between passive idioms and passive literals does not entail that the two conditions bring into play the same processing strategies. More realistically, they could call for different processing mechanisms which are both more effortful than those required for reading active forms. In this regard, the fact that passive idioms resulted more challenging to read than active idioms actually ties in with the traditional theoretical claim that passivization is not feasible and felicitous for all idioms (Weinreich, 1969; Katz, 1973; Nunberg et al., 1994; Tabossi et al., 2011), but still represents a marked and disruptive construction where idioms lose the processing advantage exhibited in the active canonical form (cf. Figure 3.2). This processing facilitation for idioms and formulaic units in general over novel matched literal phrases in the canonical active form has already been found multiple times in eye-tracking (Underwood et al., 2004; Siyanova-Chanturia et al., 2011a; Carrol et al., 2016; Carrol and Conklin, 2017), self-paced reading studies (McGlone et al., 1994; Kim and Kim, 2012) and grammaticality judgments (Jiang and Nekrasova, 2007) studies and confirms the status of idiomatic expressions as frequent, conventional and predictable units that, despite being semantically

noncompositional, are nonetheless accessed and integrated in the sentential context faster than literal compositional expressions, which, their greater semantic compositionality notwithstanding, in this experiment constitute less frequent and less conventional matches created *ex-novo*. Other contributions that worked with different formal and syntactic manipulations like McGlone et al. (1994) found this same pattern whereby the idiomatic advantage of the canonical form is lost when the original idiom is altered, with no significant difference between the processing of the modified idiom and of the corresponding literal control. By contrast, Geeraert et al. (2017a) in their eye-tracking experiment test different syntactic variants but anyway do not find any significant difference in the reading times of idiom canonical forms, idiom variants as long as the original idioms and idioms used literally. Both McGlone et al. (1994) and Geeraert et al. (2017a) in any case explore other formal variants than passivization. In light of these data, we could go so far as to posit a “dual-route” idiom processing mode, whereby idioms are accessed and retrieved faster than novel matched phrases when they are in their standard and most frequent citation form and are instead analyzed compositionally akin to literal language when their form is altered. In fact, as Siyanova-Chanturia (2015) clearly points out, it is important to bear in mind that most psycholinguistic studies that detect an idiom or multiword advantage over literal language and, by building on this, support Wray’s (2002; 2008) claim that formulaic units are processed as unitary wholes like single morphemes, actually lack the appropriate methodology to support this conclusion. Faster reading times hence do not entail wholesale retrieval and processing and actually plenty of studies whose evidence could be brought in favor of the holistic storage argument suggest that the syntax and semantics of idiom and multiword subwords is still activated in processing, just like subword frequency still affects the processing of such word combinations (Konopka and Bock, 2009; Snider and Arnon, 2012). Most importantly, our prediction that subjects would process Passive II more smoothly was not supported

by our data. Actually, Passive II resulted to be read and re-read overall slower than Passive I (total reading time) and elicited a marginally significant higher number of fixations, suggesting that maintaining verb-noun shallow order did not help readers to make sense of the string and integrate it into the context more rapidly, but conversely it hampered them in doing so. Different explanations could be put forward to account for this outcome. First off, if we stick to the usage-based tenet that higher frequency of exposure to a given construction makes it more entrenched in our mental lexicon and thus more readily available in comprehension and production (Langacker, 1987; Tomasello, 2003; Bybee, 2010), we can consequently expect Passive II to be slower to process because of its lower frequency of usage. A quick and dirty query made on the La Repubblica corpus (Baroni et al., 2004; 380M tokens) returned roughly 1.5M instances of the transitive verb-noun Active construction with the verbs used in our dataset, 42K instances of the Passive I construction and just about 24K instances of the Passive II construction. If we take corpus statistics as an approximation of the actual frequency of occurrence of a given linguistic phenomenon in real-world language usage, we can see that postverbal-subject passives, albeit possible, wide-spread and perfectly grammatical, are still the less preferred alternative among the three. A second, more complex explanation of this unforeseen result has to do with the pragmatic felicitousness of the stimuli we created. In this first experiment we aimed at comparing the three syntactic conditions in a minimal single-sentence context containing just the idiom and a disambiguating region that made the idiomatic or literal interpretation of the string clear. To be as conservative as possible, we just manipulated the idiom region modifying the voice of the idiom verb and the relative position of the verb and the noun. One problem with this method is that the three constructions possess different pragmatic functions and information structures, so that presenting, for instance, a passive structure in an out-of-context single sentence might have resulted unnatural and artificial to the

speakers. An important factor in determining the aptness of the constructions under investigation is noun definiteness and most of our idioms (55 out of 60) contained a definite NP (e.g. *tagliare la corda*, *gettare la spugna*). On the one hand, a definite NP in the Passive I condition (e.g. *la corda è stata tagliata*) sets the NP as a topic, while the following part of the sentence encompassing the passive verb and the *by*-agent phrase works as the comment and provides information about the topic. The information contributed by the agent phrase could also be read as a focus or even a contrastive focus: we could imagine a sentence like *La corda è stata tagliata da Giorgio* ‘The rope was cut by Gianni’ to be uttered in response to a question like *Who cut the rope?* or to stress that it was Giorgio and not someone else who cut the rope. On top of this, the topical definite NP at the beginning of the sentence must refer to an entity or a referent that has already been brought up in the discourse in order to sound acceptable. Likewise, Pinto (1997) observes that definite NPs in postverbal-subject structures in Italian must satisfy a uniqueness constraint, i.e. they have to denote referents which are uniquely identifiable and have already been mentioned in the universe of discourse or in the common ground between the interlocutors. Therefore, sentences like *È stata tagliata la corda* (lit. ‘was cut the rope’) are acceptable only if the definite NP *la corda* has already been cited. Both in the case of Passive I (*La corda è stata tagliata*) and in the case of Passive II (*È stata tagliata la corda*), it may come across as unnatural and unexpected to mention the definite *la corda* for the first time with no previous context. Also, from an information structure standpoint, a postverbal-subject structure like Passive II does not topicalize either the verb or the noun, but it is mostly used to convey an entirely new piece of information. In sentences like *È stata tagliata la corda* ‘the rope was cut’ (lit. ‘was cut the rope’) or *È stato ucciso un uomo* ‘a man was killed’ (lit. ‘was killed a man’), the rope being cut and the man being killed are both likely to be completely new pieces of information that in Italian are likely to be arranged this way to answer a question

like *What happened?* Therefore, putting the *by*-agent phrase right after the idiom region would add another novel and focal element that makes the sentence informationally heavy and unnatural, considering also that passive structures, in and of themselves, prototypically defocalize the agent and put focus on the patient. Apropos, it is interesting to observe that the greater processing complexity of Passive II with respect to Passive I comes out in a late measure like total reading time, therefore after the reader has exited the phrase area on the right for the first time and has encountered the *by*-agent right after it.

Finally, as concerns the role of meaning knowledge, familiarity and semantic transparency in the processing of idiomatic expressions in the three syntactic conditions, first of all meaning knowledge never appeared as a significant predictor in our models. Second, familiarity (Figure 3.4 and 3.5) appeared not only to speed up the processing time of idioms in their canonical form as previously demonstrated in the literature (McGlone et al., 1994; Titone and Libben, 2014), but also to play a role in making the reading of idiom formal variants smoother, as already observed in Geeraert et al.'s (2017a) eye-tracking data. As for semantic transparency, the traditional claim coming from Nunberg et al. (1994) and from Gibbs and Nayak's (1989) idiom decomposition hypothesis predicts a black-or-white distinction between semantically analyzable idioms allowing for syntactic change and semantically unanalyzable ones allowing for no syntactic manipulation. First of all, we opted for a broader concept of semantic transparency that does not mandate an isomorphic mapping between parts of the literal string and parts of the idiomatic meaning, but rather measures to what extent the idiomatic meaning can be inferred at a general level from the literal meaning of the combination over and above a strict analogical correspondence. What came to the fore is that also this broader-sense transparency facilitated the reading of syntactically transformed idioms (Figure 3.6 and 3.7): it is thus not strictly necessary to have a precisely identifiable one-to-one mapping between idiom subwords and components of the

idiomatic reference, but rather the very fact that the semantics of a given idiom can be somehow motivated by a speaker is enough to make formal variants for that idioms more acceptable. In contrast with Nunberg et al. (1994) and Gibbs and Nayak's (1989) predictions though, we detected a gradual facilitating effect of semantic transparency, with no clear-cut difference between idioms which did not tolerate passivization at all and idioms which did, as in Stone's (2016) self-paced reading experiment. The absence of such a neat distinction can first be attributed to the influence of pragmatic context, as maintained by Cacciari and Glucksberg (1991) and Glucksberg (2001), that in proper cases can justify the presence of a formal variant, and also to the methodology at issue, where subjects presented with a transformed idiom in a clearly idiomatically biasing context will still be able to make sense of it, though not processing it with the same speed they would have with an idiom in a canonical form. Finally, despite our prediction on Passive II advantage not being borne out by our data, it is anyway interesting to observe that in early measures (first pass reading time and go-past time), both familiarity and transparency seem to have a parallel effect on Active and Passive II alike and a different one on Passive I. More specifically, before the subjects exit the idiom region on the right for the first time, familiarity seems to have no effect on Passive I, but just to facilitate Active and Passive II. An interesting explanation that partly fits with our prediction is that before the readers encounter the ensuing context, Passive I structures have not been identified as idioms yet because idiomatic constituents show up in a switched order, so familiarity cannot come in handy at this early point. Vice versa, since both Active and Passive II display the canonical verb-noun order of the idiom in its citation form, both conditions might have already been identified as actual idioms and so in this case subjective familiarity can exert its influence on the early lexical access of the phrase. Once the entire sentential context has been read (total reading time), subjects may have realized that also the Passive I structures they have just read actually

are reversed idioms, so familiarity can have a facilitating role for all the three conditions at this late stage. By the same token, semantic transparency in go-past time has a much greater influence on Passive I than on Active and Passive II. A tentative explanation could be that since Active and Passive II are more easily recognized as idioms because of the same shallow order, with also a facilitating role of familiarity, semantic transparency cannot further accelerate their early processing. By contrast, readers are more prone to identify the reversed idiom in Passive I and consequently to exhibit some idiom processing advantage if it is possible to somehow arrive at the idiomatic interpretation from an independent analysis of the idiom subparts and so if the idiom is more transparent. In a similar fashion to what happens with familiarity, once the whole stimulus has been read (total reading time), transparency at this point speeds up both Passive forms alike. Quite curiously, the reading of Active idioms is hindered by increasing transparency, probably because it leads subjects to a slower word-by-word analysis of the idiomatic string. Hence, although Passive II appears more effortful and less natural to read, probably because of the pragmatic weirdness of our stimuli that we discussed so far, the interaction of familiarity and transparency with the Syntax variable in early measures seems anyway to suggest that keeping surface verb-noun order in Passive II leads speakers to analyze it in a way to some extent similar to the Active form.

3.4 Experiment 2

When discussing the results of the first eye-tracking experiment, we hypothesized that one of the major issues with our data was that we tried to be as conservative as possible and compared Active, Passive I and Passive II in a minimal one-sentence context, where just the phrase area was modified to have the three different conditions. In doing so, we did not take into account the fact that the three syntactic

conditions have different pragmatic and information structure-related functions, therefore creating unnatural stimuli that made the reading of syntactically modified idioms even harder. First of all, the prototypical function of passive structures is to defocalize the agent and bring the patient to the attention of the comprehenders, so the presence of an agent phrase in Passive II especially might have made the sentences too informationally heavy to process. We thus thought that using impersonal passives would be more natural. Second, definite NPs in both Passive I and II require their referents to have already been brought up in the universe of discourse or to already exist in the common ground between the speaker and the comprehender. Accordingly, while inserting such NPs into single sentences is pragmatically odd and unexpected, using wider dialogic contexts can provide readers with more ecological stimuli, where the two Passive constructions are used in a more appropriate and felicitous context. Goldberg (2019) expresses the urge for experimental designs that make use of ecological and dialogic stimuli instead of artificially crafted single sentences:

Linguists and psychologists often study sentences out of context which may be akin to studying animals in separate cages in a zoo [...] Our understanding of language will undoubtedly benefit if we spend more time studying language in its natural habitat: conversation (Goldberg, 2019, p. 146).

The aim of this follow-up experiment was to compare the reading of idiomatic Passive I and Passive II in a more natural dialogic context that would result pragmatically apt for both structures and at the same time neutralized any functional difference between the two, so as to make sure as much as possible that whatever difference we would find was to be attributed to the different surface realization of the two Passive structures. For this purpose, we came up with a two-line dialogic context like the following, where the first speaker (A) brings up the idiomatic

meaning and asks a two-alternative question and the second speaker (B) replies with a defocalized passive idiom in a corrective cleft sentence with no *by*-agent phrase:

- (53) A: Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi?
'Which piece do you think has impressed the audience the most last night at the concert? The string quartet?'

B: No, è stato con il concerto per due pianoforti che il segno è stato lasciato / è stato lasciato il segno nel pubblico, a giudicare dalle reazioni degli spettatori.

'No, it is with the concert for two pianos that the mark was left / lit. was left the mark in the audience, judging from the reaction of the public'.

Three major considerations are due on the way we crafted our context dialogues. First of all, the fact that both passive structures are placed inside the subordinate clause of a cleft sentence assures they are not in a focus position. The novel and contrasting information is already provided in the main clause, while the two passive constructions repeat information that has already been mentioned by the first speaker, so there is no difference in the informative value of the two structures here. Second, in this follow-up study we just zoom in on the comparison between the two Passive forms, which represented the most controversial point in experiment 1, leaving aside the Active condition, which we have already confirmed to be the canonical form that is read and processed most rapidly. Thirdly, we have already pointed out that 55 out of the 60 idioms in our dataset have a definite article in their citation form, while the other 5 have an indefinite article (*attaccare un bottone* 'to strike up a conversation' lit. 'to attach a button', *fare una croce* 'to forget about something' lit. 'to make a cross', *prendere una cotta* 'to get a

crush’, *spezzare una lancia* ‘to defend something or somebody’ lit. ‘to break a spear’ and *subire uno scacco* ‘to suffer a setback’ lit. ‘to suffer a checkmate’). Although we should have limited ourselves to inflect our idioms in the two Passive conditions without any other modification, in the case of these 5 idioms we had to present them with a definite article in the corrective cleft sentence because their NP had inevitably to refer to the previously mentioned idiomatic meaning. The whole point of this second experiment was therefore to compare the two idiomatic and passive constructions in stimuli that were as contextually apt and natural as possible.

3.4.1 Method

Participants

Thirty students at the Scuola Normale Superiore of Pisa and at the University of Pisa who did not take part in experiment 1 (13 females, mean age = 24.23, age range = 20-30) took part in this second eye-tracking experiment. Once again, all subjects were native speakers of Italian, had normal or corrected-to-normal vision, reported no reading or other language-related disorders and were all unaware of the research question being investigated. All participants gave written consent prior to their participation. The study was approved by the Scuola Normale Superiore Ethics Committee.

Materials

In this second experiment we used the same 60 Italian verb-determiner-noun idioms of experiment 1, for which we had already collected familiarity, meaning knowledge and semantic transparency ratings. For each idiom, we created 4 experimental dialogues in the Idiom Passive I, Idiom Passive II, Literal Passive I

and Literal Passive II condition respectively, ending up with 240 experimental dialogues in general. Examples of experimental dialogues in the 4 conditions are given in Table 3.4.1.

Idiom Passive I
<p>A: <i>Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi?</i></p> <p>B: <i>No, è stato con il concerto per due pianoforti che <u>il segno è stato lasciato nel pubblico</u>, a giudicare dalle reazioni degli spettatori.</i></p> <p>A: 'Which piece do you think has impressed the audience the most last night at the concert? The string quartet?'</p> <p>B: 'No, it is with the concert for two pianos that <u>the mark was left</u> in the audience, judging from the reaction of the public'.</p>
Idiom Passive II
<p>A: <i>Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi?</i></p> <p>B: <i>No, è stato con il concerto per due pianoforti che <u>è stato lasciato il segno nel pubblico</u>, a giudicare dalle reazioni degli spettatori.</i></p> <p>B: 'No, it is with the concert for two pianos that <u>was left the mark</u> in the audience, judging from the reaction of the public'.</p>
Literal Passive I
<p>A: <i>Dove hanno dimenticato Giulia e Andrea i sacchetti con le cose che avevano comprato al supermercato? Nel loro bagagliaio?</i></p> <p>B: <i>No, è addirittura sul nastro della cassa che <u>la spesa è stata lasciata</u>, perch erano distratti ed impegnati in un violento litigio.</i></p> <p>A: 'Where did Giulia and Andrea forget their grocery bags from the supermarket? In their trunk?'</p> <p>B: 'No, it is on the check-out counter itself that <u>the groceries were left</u>, because they were both absent-minded and having a violent fight'.</p>
Literal Passive II
<p>A: <i>Dove hanno dimenticato Giulia e Andrea i sacchetti con le cose che avevano comprato al supermercato? Nel loro bagagliaio?</i></p> <p>B: <i>No, è addirittura sul nastro della cassa che <u>è stata lasciata la spesa</u>, perch erano distratti ed impegnati in un violento litigio.</i></p> <p>B: 'No, it is on the check-out counter itself that <u>were left the groceries</u>, because they were both absent-minded and having a violent fight'.</p>

Table 3.4: Examples of experimental dialogues in the 4 conditions (Idiom Passive I, Idiom Passive II, Literal Passive I and Literal Passive II) of experiment 2.

The complete list of dialogues created for experiment 2 is reported in Table B.6; of note, a literal translation has been provided for passivized idioms, since some of them have an intransitive meaning that cannot be passivized sensibly in English. Since the structures of these new stimuli was totally different and more articulated than in the first study, we built our dialogues from scratch, using the same idioms and matched literals as before but in different contexts. Unfortunately, due to the semantic and syntactic complexity of the stimuli, we did not manage to keep the passive phrases in the same position across items (e.g. always appearing after three words, etc.). Therefore, we included the position of the phrase in the sentence as a covariate in the mixed models we will present in Section 3.4.3.

Naturalness judgments were collected for our 240 experimental dialogues. 40 subjects (31 females, mean age = 24.85, age range = 20-55) were presented with

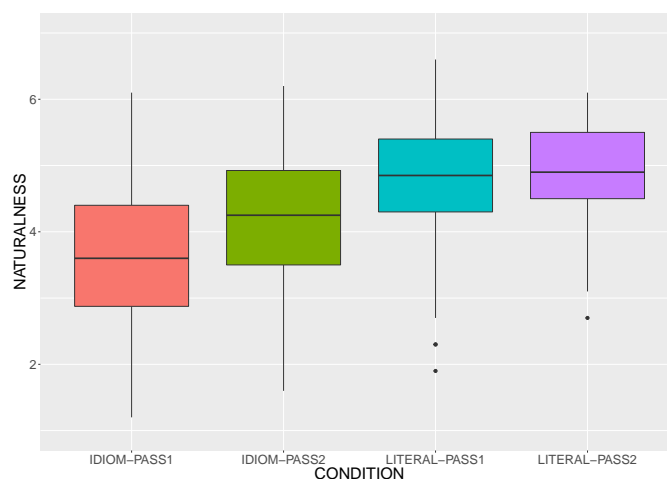


Figure 3.8: Boxplot of naturalness ratings given to the 240 dialogue stimuli in the 4 experimental conditions (experiment 2).

a list of our dialogues and prompted to rate on a 1-7 Likert scale how natural and plausible each dialogue sounded to them, with 1 standing for ‘totally unnatural’ and 7 for ‘perfectly natural’. More precisely, 4 counterbalanced lists of 60 dialogues each were prepared, each list being rated by 10 subjects. The average naturalness rating for each item in each condition is reported in Table B.5 in the Appendix. The boxplot in Figure 3.8 summarizes the naturalness ratings given to our dialogues. Once again, a two-way ANOVA revealed a significant main effect of idiomaticity [$F(1,59) = 32.19, p < .001$], with idiomatic dialogues being judged as less natural than literal ones, and syntax [$F(1,59) = 19.18, p < .001$], and a significant idiomaticity \times syntax interaction [$F(1,59) = 4.50, p < .001$]. Bonferroni-adjusted post-hoc pairwise comparisons with Wilcoxon signed rank test revealed no significant difference between Literal Passive I and Literal Passive II, while, interestingly in line with our predictions, Idiom Passive II was judged significantly more natural than Idiom Passive I ($p < .01$). All in all, naturalness judgments in all four conditions were significantly higher than naturalness judgments given to the same conditions in the previous experiment (Idiom Passive I $p < .05$, Idiom Passive II $p < .001$, Literal Passive I $p < .05$, Literal Passive II $p < .001$). In light of these results, we felt confident that this new dialogic context was a more natural

one for both passive structures, reducing the possibility that any disruptive effect on reading time measured in both conditions was due to the artificial nature of our stimuli rather than the interaction between idiomaticity, verb voice and word order. Since we failed to find a significant difference in naturalness between the two Literal conditions, but we did find one in the idiomatic dialogues, in the rest of the experiment we just concentrated upon the two idiomatic conditions, which also represent the focus of our experimental question, to take a closer look at the different time course of Idiom Passive I and Idiom Passive II processing.

In preparation to the eye-tracking experiment, cloze probability was thus measured for the two idiomatic conditions only. Since in the first experiment (Section 3.3.1) we saw that cloze probability when sentences are cut off before the first idiom component is always very low because subjects do not have enough linguistic material to guess the presence of an idiom in the sentence and we just used cloze probability on the second component as a predictor in the eye movement data analysis, in this second study we just presented subjects with dialogues being cut off before the final idiom word. This was the noun in Passive II condition and the verb participle in the Passive I condition. We thus ended up with 2 counterbalanced lists, each having 60 dialogues interrupted before the idiom final word:

1. **Idiom-Passive I-w2:** *A: Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi? B: No, è stato con il concerto per due pianoforti che il segno è stato...*
2. **Idiom-Passive II-w2:** *A: Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi? B: No, è stato con il concerto per due pianoforti che è stato lasciato il...*

Each participant to the survey was presented with one of the list and asked to complete the dialogues with the first meaningful words that came to mind. 24

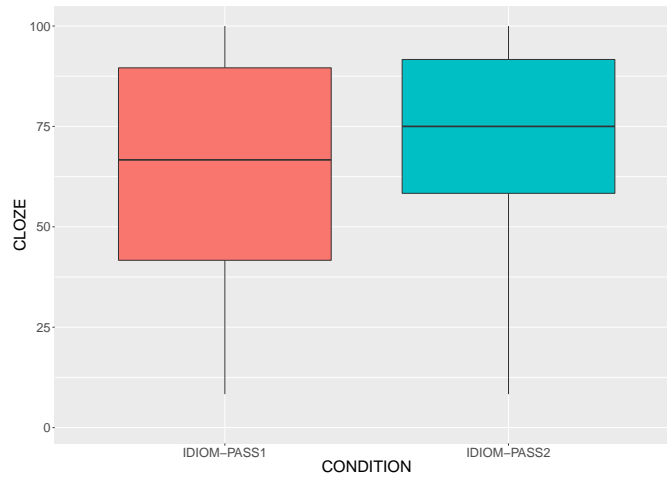


Figure 3.9: Boxplot of cloze probability ratings given to the 120 dialogue stimuli in the 2 experimental conditions (experiment 2).

Italian native speakers (21 females, mean age = 25.70, age range = 19-38) that were not included in the eye-tracking part of the study and did not complete any other questionnaire rated our dialogues for cloze probability. Each list was filled in by 12 raters. The average cloze rating for each idiomatic item in the two conditions is reported in Table B.5 in the Appendix. As the boxplot in Figure 3.9 shows, passives with postverbal subjects were completed as idiomatic significantly more often than passives with preverbal subjects ($p < .001$). This other offline piece of evidence seems to point to the fact that, in a proper pragmatic context, passivized idioms are identified more easily when the verb-noun order of the active form is kept. Although idioms are in a syntactically altered condition, subjects are nonetheless helped in predicting the end of the expression by linear word order.

A third kind of offline ratings we collected is literal plausibility, also called literality, which in previous normative studies (Titone and Connine, 1994b; Tabossi et al., 2011) has often been conceptualized as the degree to which a given idiom possesses a plausible literal interpretation in addition to the idiomatic one. While for instance *kick the bucket* also makes sense as a literal phrase, both *be in the know* and *shoot the breeze* do not, given that the former is syntactically ill-formed and contains a bare infinitive in the noun position of a prepositional phrase and

the latter is semantically anomalous and violates the selectional restrictions of *shoot* and *breeze* (*breeze* is not a shootable thing and *shoot* is not something you would do to a breeze). Previous studies have found inconsistent evidence on the role of literality on idiom processing. In his unpublished doctoral dissertation, Brannon, as reported in Popiel and McRae (1988), detects longer latencies in a sentence classification task for idioms with a plausible literal meaning with respect to idioms that can only be interpreted figuratively. Other studies find opposite results (Cronk and Schweigert, 1992; Swinney and Cutler, 1979). Botelho Da Silva and Cutler (1993) conduct an incidental-memory study, finding no significant difference in the ability of subjects to remember literally plausible and non literally plausible idioms, though idioms are still recalled overall much better than literal control strings. In a cross-modal priming study, Titone and Connine (1994a) study literal meaning activation in the idiom-final word at idiom offset as a function of predictability and literality and find activation for all idiom types except idioms that are highly predictable, but do not have a plausible literal meaning. The main controversial point in this way of assessing literality is that even though a certain idiom may have a virtually possible literal meaning, like the Italian *spezzare una lancia (in favore di qualcuno/qualcosa)* ‘to defend someone/something’ (lit. ‘to break a spear (in favor of someone/something)’ or *gettare la spugna* ‘to throw in the towel’, it might be the case that these expressions are never or rarely encountered as literal phrases in written or spoken Italian, in the first case because it is rare to talk about someone literally breaking spears in our society and culture, in the second case because a speaker of contemporary Italian would probably go for the verb-particle synonym *buttare via* rather than the more formal *gettare* when talking about someone literally throwing a towel away. In this regard, Popiel and McRae (1988) collect a more elaborated version of literality judgments, asking subjects to rate their familiarity with the literal and the figurative meaning of each idiom and observing that idioms are way more different from each other for

the familiarity of their literal meaning than for the familiarity of their idiomatic meaning. Milburn (2018) collects meaning dominance ratings to be used as predictors in a phrase-to-word priming paradigm and lexical decision task and in an eye-tracking reading experiment on idioms. To collect the ratings, subjects are presented with an ambiguous idiom like *have cold feet* and are asked to rate what percentage of the time they expect the idiom to be used in its literal meaning (e.g. *your feet are cold*) and in its figurative meaning (e.g. *retreat from an undertaking*). In the primed lexical decision task, participants exhibit the lowest accuracy when responding to literal target words following highly figuratively-dominant idioms. In the eye-tracking experiment, participants appear faster to read idioms with highly dominant figurative meanings. All things considered, bearing both the plausibility and the meaning dominance aspect in mind, we collected literal plausibility ratings from other 10 subjects (3 females, mean age = 26.90, age range = 24-31), presenting them with a list of our 60 idioms and asking them to express on a 1-7 Likert scale how plausible and frequent it is, in their opinion, to find each idiom used in its literal sense in both written and spoken Italian. Our idioms obtained an average literal plausibility score of 3.71 (SD = 1.27), with *indorare la pillola* ‘to gild the pill’ being rated as the least literally plausible and frequent one on average (1.87) and *staccare la spina* ‘to pull the plug’ being rated as the most literally plausible and frequent one on average (5.8). The average literal plausibility score for each idiom is reported in Table B.2 in the Appendix.

Differently from the first experiment, we just had two experimental conditions being tested here, namely Idiom Passive I and Idiom Passive II. We thus created two counterbalanced lists of 60 experimental dialogues (30 Idiom Passive I dialogues + 30 Idiom Passive II dialogues) each plus other 90 filler dialogues containing a variety of syntactic and semantic phenomena that differed from the experimental manipulations. Participants were randomly assigned to either list until we had fifteen participants completing each list. Filler dialogues included:

- **15 dialogues with active literal answers**

A: *Cosa ha comprato Maria ai genitori per il loro anniversario di nozze?*

‘What did Maria bought her parents for their wedding anniversary?’

B: *A quanto pare ha regalato loro un viaggio in Amazzonia di due settimane.*

‘As it seems, she bought them a two-week trip to the Amazon rainforest’.

- **10 dialogues with cleft active literal answers**

A: *Con che mezzo Valerio ha girato il Canada? Con la bicicletta?*

‘Which means did Valerio take to travel through Canada? A bike?’

B: *No, è con la macchina che ha esplorato il posto, considerato che era inverno e faceva troppo freddo.*

‘No it is with the car that he explored the place, considering it was winter and it was too cold’.

- **10 dialogues with passive I literal answers**

A: *Come mai la polizia si è radunata all’improvviso davanti al ristorante in centro città?*

‘How come the police gathered all of a sudden in front of the downtown restaurant?’

B: *A quanto dicono un uomo è stato assassinato stanotte mentre passeggiava lì davanti con sua moglie.*

‘Rumor has it a man was killed last night while he was strolling right in front of it with his wife’.

- **10 dialogues with cleft passive I literal answers**

A: *Perché hanno demolito la vecchia scuola del paese? Per ordine del sindaco?*

‘Why did they tear down the old school in town? Because the mayor order that?’

B: *Sì, è stato per un’ordinanza del comune che l’edificio è stato abbattuto, per costruire un nuovo centro commerciale.*

‘Yes, it was because of a municipal ordinance that the building was torn down, in order to build a new mall’.

- **10 dialogues with passive II literal answers**

A: *Come mai hanno interrotto la costruzione della nuova linea della metropolitana?*

‘How come they stopped the construction works of the new subway line?’

B: *Perché sono state rinvenute le fondamenta di un’antica villa romana proprio nel punto in cui dovevano costruire i binari.*

‘Because the foundations of an ancient Roman villa were found in the exact spot where they had to lay down the tracks’.

- **10 dialogues with cleft passive II literal answers**

A: *Da chi sono stati visitati i passeggeri malati del volo Dubai-New York una volta atterrati? Dal personale medico?*

‘Who were the sick passengers of the Dubai-New York flight visited by once they touched down? From the medical personnel?’

B: *Sì, è dal Centro per il Controllo delle Malattie che sono stati visitati i passeggeri dopo che l'aereo era atterrato a New York.*

‘Yes, it is by the Disease Control Center that the passengers were visited after the aircraft had touched down in New York’.

- **20 dialogues with semantically anomalous answers**

A: *Cos'ha bevuto Lucio come prima cosa quando è rincasato dopo la corsa?*

‘What did Lucio drink first when he got back home after jogging?’

B: *Ha bevuto un sorso d'acqua dalla radio sul tavolo della sala perché era molto assetato.*

‘He drank a sip of water from the radio in the kitchen table because he was very thirsty’.

- **10 dialogues with semantically anomalous cleft answers**

A: *Quanto tempo sarà che Silvia non rivede i genitori? Qualche mese?*

‘How long has not Silvia seen her parents? Some months?’

B: *No, è da più di un anno ormai che lei non li regala più, poiché si è trasferita a lavorare in Australia.*

‘No, it is more than a year that she has not given them away, because she moved to work to Australia’.

- **5 dialogues with left-dislocation active literal answers**

A: *Mario ha già letto il giornale stamattina?*

‘Has Mario already read the newspaper this morning?’

B: *Sì, il giornale l'ha comprato mentre stava andando in ufficio.*

‘Yes, the newspaper, he bought it when he was going to his office’.

3.4.2 Procedure

As in the first experiments, eye movements were recorded with an EyeLink® Portable Duo eye-tracker (500 Hz sampling rate) interfaced with a desktop PC and the experiment was assembled via the SR Research Experiment Builder software. Subjects sat 50 cm from the monitor, leaning on a chinrest, and their right eye was tracked. Stimuli were displayed on a 24-inch widescreen LCD Monitor. Dialogues were sequentially displayed one sentence at a time in 15-point Monaco yellow font on a black background, so that three characters roughly subtended one degree of visual arc. Subjects were randomly assigned to one of the two existing lists and instructed to silently read the dialogues for comprehension. Each list was divided into 4 blocks of 38 or 37 dialogues each with a short pause after the second block. Each block started with three practice dialogues. Subjects were calibrated using a 9-point grid before every block. At the beginning of each trial, participants made sentence A appear by fixating a yellow box on the left of the screen; after reading sentence A, they pressed a button on a joystick to make sentence B appear. A fixation dot was displayed at the center of the screen between trials. Yes/no comprehension questions were randomly shown after a quarter of the trials. The experiment took about 1 hour to complete.

3.4.3 Results

On average, subjects answered correctly to 92.79% of the comprehension questions, confirming they had actually read and comprehended the experimental dialogues. Reading data were once again cleaned with 4-step procedure of EyeLink® Data Viewer software. Fixations shorter than 80 ms and within one character of the previous or following fixation were merged with this neighboring fixation and remaining fixations shorter than 80 ms or longer than 1000 ms were then deleted.

As before, the reading measures we took into account were first fixation duration, first pass reading time, go-past time, total reading time and fixation count. We took both the idiom final word and the whole idiom phrase as AOIs. For each measure in either AOI, we fit a linear mixed-effects model to our data using the `lme4` package (Bates, 2010) in R (R Core Team, 2015). Syntax was inserted in the models as a two-level categorical variable (Idiom Passive I vs Idiom Passive II) and coded specifying custom contrasts to 0.5 (Idiom Passive I) and -0.5 (Idiom Passive II). Familiarity, transparency and literal plausibility ratings were mean-centered. For fixation count, generalized linear models using the Poisson distribution were fitted. As for the random structure, we specified by-subject and by-item random slopes for the Syntax condition. The fixed effects included Trial Number, AOI Length, AOI Position, to deal with the fact that we were not able to keep the idiom position in sentence B constant, Cloze probability, all the idiom-related judgments (Familiarity, Transparency, Meaning Knowledge, Literal Plausibility), the Syntax condition (Idiom Passive I vs Idiom Passive II) and the interactions between Syntax and all the idiom-related variables. To arrive at our final models, we resorted to the same backward step-by-step model selection procedure reported in Section 3.3.3, starting off with a full model containing, among the rest, all the idiom-related variables (Familiarity, Transparency, Meaning Knowledge, Literal Plausibility) together with their interactions with Syntax and then leaving out one non-significant predictor at a time, starting from the one with the lowest t-score and comparing subsequent models with a likelihood ratio test to see if removing the predictor changed the model significantly. As concerns potential collinearity between the normative predictors, Literal Plausibility did not turn out to be significantly correlated with Familiarity ($\rho = .173$), Transparency ($\rho = .179$) or Meaning Knowledge ($\rho = -.054$). The coefficients of the fixed effects and random effect structures of all the models we ran are reported in the Appendix D.

Idioms - Final word

First of all, except in first pass reading time, subjects appeared to read idiom final words faster while they proceeded along the experiment, while, except in go-past time, the longer the final word the longer they fixated on it. AOI Position had a significant negative effect on go-past time. Apparently, the more distant the idiom final word from the beginning of the sentence, the less it took subjects to exit the idiom final word on the right for the first time. Cloze probability had a significant negative effect on total reading time only: more predictable idiom final words were overall read and re-read faster. As regards the experimental manipulation, we only found a significant negative effect on first fixation duration indicating that the first fixations on the idiom final word were significantly shorter in Passive I condition, while as concerns idiom-related variables, we found increasing Meaning Knowledge to have a facilitating role on go-past time and total reading time and to elicit a lower number of fixations.

Idiom phrases as AOIs

When considering the whole idiom phrase as our AOI, both the facilitating effect of Trial Number and the disrupting effect of AOI Length turned up in go-past time, total reading time and fixation count. Quite counterintuitively, Cloze probability resulted to slow down first pass reading time, but it never turned out significant in any other measure. With regard to our main condition, in line with our predictions, Passive I idioms resulted to be read significantly slower than Passive II idioms in both early (first fixation duration and first pass reading time) and late measures (total reading time), suggesting that working with a more natural context made the predicted difference between the two conditions come to the fore. Figure 3.10 plots the estimated mean first pass and total reading time.

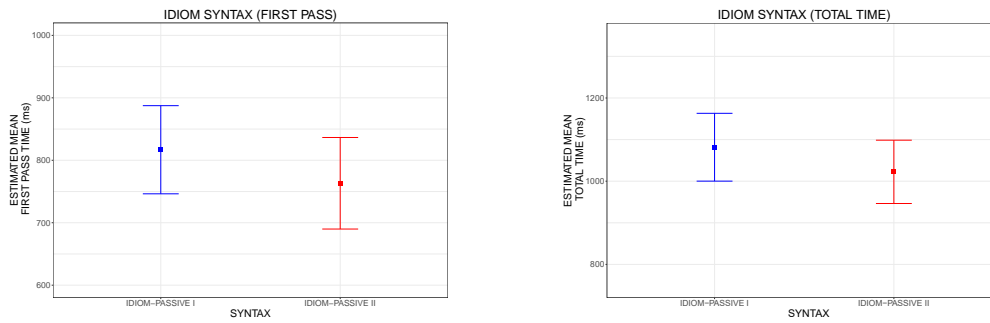


Figure 3.10: Estimated mean first pass reading time and total reading time of Passive I idioms and Passive II idioms taking the whole idiom region as AOI in experiment 2.

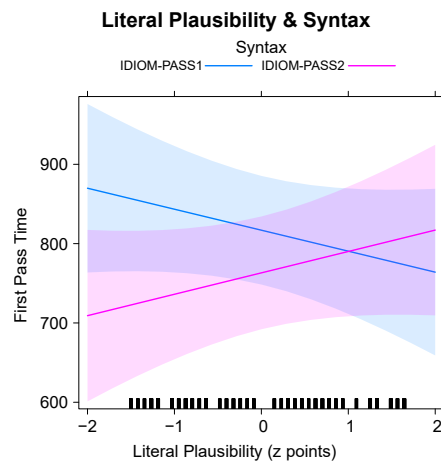


Figure 3.11: Literal Plausibility \times Syntax interaction in first pass reading time for the idiom phrase region in experiment 2.

A significant interaction between Literal Plausibility and Syntax in first pass reading time (Figure 3.11) showed that while passive idioms with preverbal subjects were facilitated by Literal Plausibility, by contrast passive idioms with postverbal subjects were slowed down if an idiom was very likely to be used in its literal sense in Italian. On the other hand, a significant Familiarity \times Syntax interaction in go-past time (Figure 3.12) revealed that readers became faster in exiting the idiom region on the right for the first time, including previous context re-analysis, in Passive I condition if the idiom was highly familiar, while Passive II condition did not seem to be considerably sped up by higher Familiarity. Finally, higher Transparency accelerated the total reading time of both Passive conditions (Figure 3.13), with a slightly greater effect on Passive I.

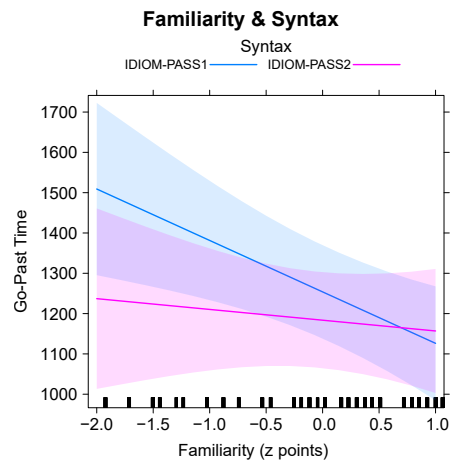


Figure 3.12: Familiarity \times Syntax interaction in go-past time for the idiom phrase region in experiment 2.

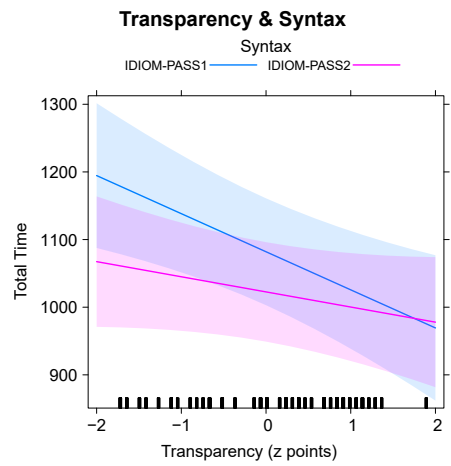


Figure 3.13: Transparency \times Syntax interaction in total reading time for the idiom phrase region in experiment 2.

3.4.4 Discussion

The focal point of this follow-up experiment was to compare the reading time of idioms in passive constructions with preverbal and postverbal subjects respectively remedying the unnaturalness of the single-sentence stimuli of the first experiment, which might have brought on some potential confounds. We therefore worked with stimuli composed of two-line dialogues where the idiomatic meaning is already referenced in the first line, so that the passive phrase in the second line is unequivocally to be intended as idiomatic. In addition, the fact that target passive phrases refer to concepts already brought up in the universe of discourse makes the presence of definite NPs in them natural and pragmatically acceptable. Since the prototypical function of passive form is to bring the comprehender's attention to the patient and defocalize the agent, we left *by*-agent phrases out of our stimuli, considering also that their presence right after Passive II phrases in experiment 1 juxtaposed two informationally new and focal elements and made the sentences in question hard to read. The corrective cleft sentence containing the defocalized passive idioms thus not only made the presence of passive forms more justifiable and natural, but also canceled out any pragmatic difference between Passive I and Passive II that would have emerged in a different context (e.g. at the beginning of a main declarative clause), for example with Passive I topicalizing the NP and Passive II conveying totally novel information. In order to make the experimental design less complex and more tailored on investigating the different processing time course of Passive I and Passive II, we left the Active condition out, having already found in the previous experiment that it is read significantly faster than the Passive conditions, in contrast with the findings of other self-paced reading studies reported in the literature (Carrithers, 1989; Traxler et al., 2014; Paolazzi et al., 2019).

Quite interestingly, a combination of offline and online evidence seems to point

towards the state of affairs predicted by our hypothesis. When analyzing offline naturalness ratings, we first of all could confirm that passivization is indeed more natural for literal phrases than for idiomatic phrases, but we found no significant difference between the two literal passive forms. A difference between Passive I and II came to the surface with idioms only, with postverbal-subject passives that kept the verb-noun order of the active form sounding more natural and plausible to speakers in an apt dialogic context. Idiomatic Passive II forms exhibited also greater Cloze probability, suggesting that idioms in this form are not only more natural, but also more readily available to speakers, despite being still passive forms as Passive I idioms. Considering online evidence, although Passive II idioms caused longer first fixations on their final word, they were overall read faster than Passive I idioms in both early and late measures. Going back to our initial hypotheses, the fact that a passive form that presents the same shallow order of an idiom in its citation form is read more smoothly than a passive structure that swaps around the verb and the noun first of all ties in with studies where preserving active-like linear order and adjacency between idiom constituents is shown to facilitate the access to the idiomatic meaning of then string even in syntactically unavailable conditions (Holsinger, 2013) or, more importantly for the study at issue, in passive structures (Dörre and Smolka, 2016). As predicted by good-enough processing theories (Ferreira et al., 2002) and other two-tier models (Townsend and Bever, 2001), it might be the case that the presence of a rich and biasing idiomatic context that leads up to the target phrase induces comprehenders to not initiate a fully detailed syntactic analysis of the phrase in case the verb and the noun are encountered in a linear order that matches with the mental representation speakers have of an idiom whose meaning is a predictable and plausible continuation of the dialogue. These data on the processing advantage of idioms in Passive II stand at odds with the grammaticality judgments proposed by Bianchi (1993) in her formal-syntactic analysis of Italian idioms, whereby idioms

that do not tolerate passive I form will not accept passive II as well, due to a supposed chain in Passive II that links the postverbal NP to an expletive in preverbal position and that makes the logical form of Passive II identical to the surface form of Passive I. The fact that passive phrases with postverbal subjects are immediately identified as idioms explains the negative effect of literal plausibility we found in first pass time, in that the availability of a frequent and plausible literal interpretation for the same string brings into play some competition between a figurative and a literal reading that results in a slowed down early integration and lexical access process (Titone and Libben, 2014). The very low facilitating effect of familiarity on Passive II with respect to Passive I in go-past time stands in contrast with the opposite pattern represented in Figure 3.4 for experiment 1, where familiarity impacted Passive II way more than Passive I. Such a discrepancy can be motivated by the different disposition of the disambiguating region across the two studies. While in experiment 1 the context that made the idiomatic interpretation clear followed the string and up to that point the subject could not fully make sure that the target phrase was actually an idiom, in this case the idiom followed a previous context where the figurative reference has already been introduced. Consequently, it makes sense that in this dialogic condition, once the expression had already been accessed as an idiom, familiarity could not be of any help. Anyway, Passive II idiom strings appeared easier to read and re-analyze at the level of late measures if they were more semantically transparent. On the other hand, swapping verb and noun around in Passive I seemed to call for a slower and more compositional analysis, whose initiation was first accelerated by a higher literal plausibility of the string and was then facilitated by a higher familiarity of the idiom and, as shown by the positive effect of transparency in total reading time, by the possibility to arrive at grasping the idiomatic meaning of the expression from its independently analyzed single constituents.

To sum up, while in Chapter 2 we concerned ourselves with a computational

and corpus-driven investigation on the lexical flexibility of idioms, concluding that a lexical fixedness-based measure is still an effective strategy to assess compositionality because idioms overall tend to occur with a more restricted range of formal variants than literal phrases, in this chapter we shifted our perspective to the processes that take place in the mind of the speakers when they have to process altered idioms, zooming in on their syntactic axis of variation. Focusing on the passive construction, we could confirm that syntactically transforming an idiom causes it to lose the processing advantage over literal language that it would exhibit in its active canonical form and makes it more challenging to process. Nevertheless, as shown by the case of passive idioms with postverbal subjects that are made possible by Italian syntax, if such formally manipulated idioms keep the same surface verb-noun order of their active citation form, a speeding up in processing is detected with respect to passivized idioms where the order of the verb and the noun is reversed. This finding apparently points to the fact that the idiom recaltrance to passivization that has often been highlighted in the idioms literature (Fraser, 1970) was mostly due to a word order violation than to a syntactic incompatibility per se, both of which were impossible to disentangle and study separately in languages like English that license only one non-marked subject-verb word order. After observing that, in terms of corpus distribution, idiom variability, albeit possible, is still all in all a less wide-spread event with respect to compositional language, we have seen that, from a psycholinguistic purview, the lower frequency and prototypicality of this phenomenon does not necessarily entail a disruption in processing with respect to the processing of unmodified idiomatic structures. The picture of idiomatic variability that comes out of these data is complex and multifaceted. As already noted in previous corpus investigations (Langlotz, 2006; Vo, 2011; Torre, 2014) and psycholinguistic experiments (McGlone et al., 1994; Cacciari, 2014; Geeraert et al., 2017a,b), a variety of factors seem to constraint its occurrence and acceptability, namely the semantic internal

structure of the idioms, their literal plausibility and their familiarity, together with the pragmatic and semantic features of the specific contexts in which idioms are used. As regards broader-scope implications of our results, we can conclude that different variables affect the way syntactic structures are processed. In addition to semantic (non-)compositionality, we have observed that, working with a minimal context, the lower frequency of a structure like the passive one can bring on a delayed and more effortful processing, in line with usage-based tenets (Langacker, 1987; Tomasello, 2003; Goldberg, 2006; Bybee, 2010) and offline evidence on passive processing (Ferreira, 2003; Street and Dabrowska, 2014) and at odds with other online evidence on passive form reading (Carrithers, 1989; Traxler et al., 2014; Paolazzi et al., 2019). The advantage of linear order-preserving Passive II over Passive I that we registered in an appropriate dialogic context also supported two-tier processing models (Townsend and Bever, 2001; Ferreira et al., 2002) that postulate a mixture of best-guess pseudo-parse heuristics and detailed algorithmic parsing to interact in sentence processing.

Chapter 4

Conclusion

In this dissertation we have proposed a collection of computational and eye-tracking experiments that investigated the relationship between idiomaticity and semantic non-compositionality on the one hand and lexical and syntactic flexibility on the other hand. More specifically, in the computational experiments in Chapter 2 we observed whether the parameter of lexical flexibility can be taken into account to devise distributional-semantic indices of compositionality that, when a set of target expressions is given as input, can successfully tell apart non-compositional idiomatic phrases and compositional non-idiomatic phrases. In Chapter 3, we described two eye-tracking experiments where we compared the reading times of idiomatic and non-idiomatic expressions in the active form, in a passive form with preverbal subject (Passive I) and in a passive form with postverbal subject that preserves the verb-noun surface order of the active form (Passive II). The aim of the two reading studies was to assess (i) whether idioms in the passive form take actually longer to read than active idioms, (ii) whether passivized idioms take longer to read than passive literal phrases and (iii) whether preserving the verb-noun order of the canonical active form of idioms in passive II facilitates processing with respect to passive I, where the surface verb-noun order of the active

form is swapped around.

In Chapter 1, we introduced and defined the notions of idiomatic expression and idiomaticity (Katz and Postal, 1963; Weinreich, 1969; Makkai, 1972; Chomsky, 1980; Fillmore et al., 1988; Cacciari and Glucksberg, 1991; Nunberg et al., 1994; Sag et al., 2002; Fazly et al., 2009; Cacciari, 2014; Titone and Libben, 2014; Geeraert, 2016) and presented a review of the related theoretical, psycholinguistic and corpus-based literature. We observed how the semantic non-compositionality of this peculiar instance of multiword expressions (Sag et al., 2002; Masini, 2012; Siyanova-Chanturia and Martinez, 2014) brings into play a lack of *salva-veritate*-interchangeability and systematicity (Frege, 1892; Fodor and Lepore, 2002) and therefore a greater recalcitrance to lexical and syntactic flexibility with respect to semantically compositional literal expressions. These semantic and formal idiosyncrasies of idioms made their analysis problematic for mainstream generative models postulating a division of labor between the grammar and the lexicon (Chomsky, 1957, 1965, 1980). These models usually regarded idioms as peripheral and exceptional phenomena that are listed as semantically empty and structurally fixed words-with-spaces in a separate section of the lexicon (Katz and Postal, 1963). Constructionist views (Langacker, 1987; Fillmore et al., 1988; Goldberg, 1995, 2006, 2019; Bybee, 2010; Hoffmann and Trousdale, 2013) that represent the grammar and the lexicon as an interrelated network of constructions (i.e. form-meaning pairings) by contrast gave idioms a more prominent and less marginal role, putting them in between single words and abstract syntactic patterns.

The semantic structure of idioms (Section 1.2) has been tackled from a variety of perspectives in the literature on idiomaticity, with various scholars putting forward different semantic taxonomies. Although idiomatic meanings cannot be composed in a bottom-up way in the Fregean sense (Frege, 1892), Nunberg and colleagues (Nunberg, 1978; Wasow et al., 1983; Nunberg et al., 1994) and Gibbs

and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a) notice that some idioms are decomposable (or analyzable or isomorphic) in that, once speakers become familiar with their meaning, they are able to map components of the literal string onto components of the idiomatic reference in a top-down process. In their taxonomy, Cacciari and Glucksberg (1991) observe that even in non-analyzable idioms the semantics of their components can still constrain their use to some extent, to the point that entirely non-analyzable idioms may not even exist. Another semantic dimension of idioms that has been investigated is transparency (or non-isomorphic motivation), namely the property whereby it is possible to spot some connection between the literal meaning and the figurative meaning of an idiomatic string by means of cognitive patterns like conceptual metaphor, conceptual metonymy, conceptual blending and emblems, over and above strictly isomorphic decomposability (Langlotz, 2006; Vo, 2011; Torre, 2014). Of note, semantic decomposability has been shown to facilitate idiom processing in a late stage of comprehension and semantic integration (Titone and Libben, 2014) and, together with semantic transparency, to make formal variants of idioms more acceptable to speakers (Gibbs and Nayak, 1989; Gibbs et al., 1989a; Geeraert et al., 2017b).

Moving on to the restricted lexical and syntactic versatility displayed by idioms, which are of central importance in our investigation, traditional lexical-specification models proposed to idiosyncratically specify in the lexical entry of each idiom which are the formal transformations it can undergo (Katz and Postal, 1963; Weinreich, 1969). Other models predicted a more patterned subset behavior, whereby idioms are disposed along implicational hierarchies according to the syntactic operations they allow (Fraser, 1970; Bianchi, 1993; Folli and Harley, 2007). Nunberg et al. (1994) maintain that lexical and syntactic flexibility is possible for idioms that display semantic decomposability, a claim that is supported by offline data from Gibbs and Nayak (1989) and Gibbs et al. (1989a). Corpus-based

studies anyway found variation to be possible even for semantically opaque idioms and to not strictly obey implicational hierarchies (Duffley, 2013; Schröder, 2013; Vietri, 2014). The occurrence of these variants seems to be justified by specific communicative needs in restricted contexts and to be constrained by cognitive factors like recognizability, functionality and grammaticality (Langlotz, 2006; Vo, 2011; Torre, 2014). Psycholinguistic data further suggest that the acceptability of a given variant for an idiom is not a black-or-white phenomenon (Stone, 2016) as predicted by Nunberg and colleagues (Nunberg, 1978; Wasow et al., 1983; Nunberg et al., 1994) and Gibbs and colleagues (Gibbs and Nayak, 1989; Gibbs et al., 1989a), but it is rather a function of context (Glucksberg, 2001; Tabossi et al., 2009b) and other idiom-related variables such as familiarity (McGlone et al., 1994; Geeraert et al., 2017b,a) and semantic transparency (Geeraert et al., 2017b,a). On top of that, existing evidence suggests that some variants (e.g. adverb insertion, adjectival insertion, lexical replacement) are more acceptable than others which disrupt the syntactic structure of idioms more evidently (e.g. passivization, movement, idiom blends; Gibbs and Nayak 1989; Tabossi et al. 2009b) and that the processing of varied idioms can result to be not significantly different from the processing of idiom canonical forms in the presence of an apt supporting context (Geeraert et al., 2017a).

The experiments reported in Chapter 2 fit into a rich computational literature focused on automatic idiom type identification (cf. Section 1.5.1). On the one hand, these studies are of practical importance, in that improved idiom identification can lead to better performances of parsing, machine translation and knowledge extraction algorithms and can provide a way to automatically enlarge the coverage of computational lexica (Constant et al., 2017). On the other hand, computational idiom identification studies are of theoretical importance, since they can reveal if focusing on traditionally idiom-related properties like non-compositionality and formal frozenness is actually a viable solution to devise effective compositionality

and idiomaticity indices. If this turns out to be the case, it means that, despite the possibility of occasional and context-specific variability, idioms tend overall to be used in a more formally fixed way with respect to compositional literal expressions. To compute our indices of semantic compositionality and idiomaticity, we started from a set of 90 Italian idiomatic and non-idiomatic verb-noun phrases and generated a series of lexical variants for these expressions by replacing their components with semantically related words. We tried both to extract these semantic neighbors in a fully automatic way with distributional semantic models (Sahlgren, 2006; Turney and Pantel, 2010; Erk, 2012; Lenci, 2018) and to extract them manually from the Italian section of MultiWordNet (Pianta et al., 2002). We then experimented with four different distributional semantic measures of compositionality, namely the mean semantic similarity between the vectors of the original expressions and the vectors of their respective variants (Mean), the maximum (Max) and minimum (Min) values among the cosine similarities between the vectors of the original expressions and the vectors of their respective variants and finally the cosine similarity between the vectors of the original expressions and the centroid vectors of their respective variants. In our expectations, in light of idioms' greater lexical fixedness, they were expected to result less distributionally similar to their variants with respect to the similarity between literal phrases and their variants.

Our approach built on previous computational studies that used lexical flexibility as a clue to compositionality. Lin (1999), for instance, generated lexical variants for a set of target expressions from a thesaurus and labeled a given expression as idiomatic if the PMI between its components resulted different from the PMI between the components of its variants. Fazly et al. (2009) further elaborated on this formula, comparing the PMI between the constituents of the original phrase with the average PMI between the components of its variants. As Bannard et al. (2003) pointed out though, resorting just to associational measures appears

more appropriate to capture institutionalization rather than compositionality per se, since even semantically compositional collocations are institutionalized and lexically fixed. Bannard et al. (2003) thus resorted to distributional semantics and computed the distributional similarity between the original verb-particle constructions they wanted to classify and their lexical variants, so as to model the fact that altering idioms lexically actually brings about a considerable meaning shift with respect to when literal phrases undergo lexical replacement. While Bannard et al. (2003) output a binary classification score and did not experiment with a great variety of parameter settings, we experimented with different ways of generating lexical variants and measuring compositionality and returned a continuum compositionality index, to account for the fact that, albeit less variable than non-idioms, idioms nonetheless exhibit varying degrees of lexical flexibility and compositionality even within themselves and that idiomaticity and compositionality are thus a gradient rather than clear-cut feature. In this regard, our aim was to observe if, even accounting for the different degrees of lexical flexibility and compositionality exhibited by idioms, they could still be successfully told apart from non-idiomatic phrases.

All in all, our measures turned out to perform automatic idiom identification successfully, with Centroid faring better than other indices like Max or Min. The superiority of the Centroid measure suggests that to appropriately distinguish between idioms and non-idioms, the entire possible range of variation generated from a given expression must be considered instead of just the most similar or least similar variant. This permits to account also for those rare cases of idioms that allow for restricted lexical flexibility and for which some semantically similar lexical variants can still be generated. In building our models, we combined a great number of parameter settings, like the source from which we generated the variants, the compositionality measure we used, the number of variants we kept for each target expression and whether or not we encoded the presence of

non-occurring variants. A feature ablation analysis anyway revealed that the most influential parameters were the source of the variants and the distributional measure we used. In this regard, generating variants in a fast and fully automatic way via distributional models brought comparable results with respect to manually extracting them from MultiWordNet, confirming the superiority of the former, less time-consuming, procedure.

In our second computational study, our distributional indices of compositionality were shown to perform effectively also with expressions with a different syntactic structure and to properly assess the compositionality and idiomaticity of 24 Italian idiomatic and non-idiomatic adjective-noun expressions as well. We also demonstrated that extracting lexical variants from a syntax-based distributional space (Padó and Lapata, 2007; Baroni and Lenci, 2010) led to a better classification performance and that our variant-based indices performed overall comparably to addition-based and multiplication-based indices that are traditionally used in the distributional literature on compositionality modeling (Fazly and Stevenson, 2008; Mitchell and Lapata, 2010; Krčmář et al., 2013).

The computational experiments in Chapter 2 thus confirmed that idioms tend overall to occur with a more restricted range of formal variations in corpora and that focusing on formal fixedness is still a valid approach to automatically measure compositionality. This finding is also corroborated by computational work on idiom identification which used syntactic rigidity as a way to detect compositionality and idiomaticity (Bannard, 2007; Villavicencio et al., 2007; Ramisch et al., 2008a; Wulff, 2008; Fazly et al., 2009; Lebani et al., 2015).

Despite corpus-based and computational evidence highlighted this general tendency of idiomatic expressions toward formal conservatism, in Chapter 3 we shifted our perspective, asking ourselves how these rarer idiomatic variants are actually processed by speakers from a cognitive viewpoint and carried out two eye-tracking

studies that investigated how passivization and word order interact in affecting reading times of idioms. Of note, since postverbal-subject passive structures are allowed by Italian syntax and not in English, where most of the idiom literature has been produced, comparing the reading times of passives with preverbal subjects and passives with postverbal subjects represented an element of novelty with respect to the eye-tracking literature on idiom and idiom variant processing (Titone and Connine, 1999; Underwood et al., 2004; Siyanova-Chanturia et al., 2011a; Cieřlicka et al., 2014; Carrol et al., 2016; Carrol and Conklin, 2017; Geeraert et al., 2017a; Titone et al., 2019), to the literature on passive form processing (Ferreira, 2003; Street and Dabrowska, 2014; Paolazzi et al., 2019) and to studies that dealt with passivization in idioms specifically (Fraser, 1970; Gibbs and Nayak, 1989; Tabossi et al., 2009b; Stone, 2016). In both experiments we used a dataset of 60 Italian verb-determiner-noun idioms, for which we collected familiarity, meaning knowledge, semantic transparency and literal plausibility normative ratings from 94 Italian native speakers.

The first experiment (41 subjects), that made use of single-sentence stimuli, returned unclear results. Idioms exhibited an advantage over literals in the active form, but no significant difference was found between idioms and literals in the two passive forms. Overall, passives appeared to be read faster than actives, but, at odds with our predictions, passive II turned out to be read more slowly than passive I. Hypothesizing that these unexpected data could be brought on by the unnaturalness of our stimuli, which probably did not fully comply with the different pragmatic functions of passive I and passive II, contained unnatural *by-agent* phrases right after the idiom region and all in all provided subjects with a too restricted context, we carried out a follow-up experiment, where we compared the processing of passive I and passive II in more pragmatically natural dialogic stimuli (Goldberg, 2019). In an offline survey, we first of all observed that passive literals were rated as more natural than passive idioms and that passive II was

finally rated as more natural than passive I. To zoom in on the time course of the online processing of idiomatic passive I and idiomatic passive II, we compared the two conditions in a second eye-tracking study (30 subjects). In this case, idiomatic passive II was read significantly faster than idiomatic passive I, showing that preserving the canonical verb-noun order of the active form in passive II facilitated the processing of passive idioms. These data suggested that one of the core issues with passivized idioms that makes them less acceptable than their active counterparts might be the reversal of the linear verb-noun order in which subjects are used to experiencing them rather than verb voice per se.

In line with previous evidence on the impact of idiom-related variables on idiom processing (Libben and Titone, 2008; Titone and Libben, 2014), both experiments confirmed an early role of familiarity in making both active and passive idioms faster to read and a later role of semantic transparency. In the second experiment, literal plausibility was found to inhibit the reading of passive II idioms in first pass time, probably because they were already recognized as idiomatic due to the preserved verb-noun sequence and some competition between a literal and a figurative reading was brought into play.

The results that came to the fore in the two eye-tracking experiments can be related to both idiom processing and broader-scope sentence processing theories. As regards the contribution that these experiments bring to idiom-processing models, we confirmed that the specific properties of each idiom, like familiarity, transparency and plausibility, differentially affect its processing. This evidence goes against the first lexical look-up models (Bobrow and Bell, 1973; Swinney and Cutler, 1979; Gibbs, 1980), that just set idioms against non-idioms without taking into account the gradient nature of idiomaticity, and is more in line with models underlining the role of idioms' internal semantics, predictability and familiarity on the time course of their comprehension (Cacciari and Tabossi, 1988;

Gibbs and Nayak, 1989; Titone and Connine, 1999). Slightly at odds with the Idiom Decomposition Hypothesis (Gibbs and Nayak, 1989) anyway, we showed that even non-isomorphic semantic transparency can have a facilitating effect on reading times. All in all, we can relate our results to hybrid views predicting both direct lexical access and compositional analysis to interact in idiom processing (Cacciari and Tabossi, 1988; Titone and Connine, 1999), given that idioms appear to be read and processed faster than matched novel phrases in the active form and to be processed more slowly and compositionally in syntactically altered forms. As stressed by Siyanova-Chanturia (2015) though, the idiom superiority effect registered in the active form must not be straightforwardly interpreted as a clue of holistic processing (cf. Wray 2002; Bobrow and Bell 1973; Swinney and Cutler 1979; Gibbs 1980) but it can just mean that idioms are computed faster word-by-word. As once again predicted by hybrid models, access to the idiomatic form is facilitated when idioms are more familiar to the speakers (Libben and Titone, 2008; Titone and Libben, 2014). In this regard, the parallel effect of familiarity on active and passive II in experiment 1 (Plots 3.4 and 3.5) and the fact that idioms in passive II form were read faster and rated as more natural and predictable than idioms in passive I form in experiment 2 suggest that preserving linear order and adjacency between the verb and the noun constituent can make a passivized string more easily recognizable as an idiom (cf. Holsinger 2013; Dörre and Smolka 2016). Of note, our study did not take lexical variation into account as well, but we can compare our data with Geeraert et al.'s (2017b) eye-tracking data, which reveal that idiom lexical variants do not pose a challenge to their processing with respect to the canonical form when the idiom is put at the end of an idiomatically-biasing context.

As we stressed oftentimes, these findings can benefit other not idiom-related sentence processing views which predict that a full access to the syntactic structure of an utterance is not always carried out during processing, but that under certain

circumstances subjects can be left with a gut-level pseudo-parse (Townsend and Bever, 2001; Ferreira, 2003). In our case, the fact that a passivized structure presented the same verb-noun order in which subjects are used to encountering a given idiom, that this idiom was familiar and its semantics could be easily accessed from its literal string and that this phrase was put after a rich idiomatically-biasing context led the subjects to more easily interpret it as an idiom even though it occurred in a syntactically non-canonical structure.

To conclude, the evidence collected in this thesis showed that a multimethodological approach can be fruitful for investigating a complex phenomenon like idiomatic variability from complementary perspectives (Wulff, 2008; Lebani et al., 2015; Geeraert, 2016; Stone, 2016). In general language use, idioms tend to occur with a more restricted range of formal variation than compositional and literal expressions, so Natural Language Processing algorithms can successfully leverage such formal fixedness to automatically distinguish between compositional and non-compositional expressions. Nonetheless, idioms are far from being frozen and semantically dummy complex words and, according to specific communicative needs, can undergo alterations in their lexis, in their syntax and in their semantics, provided that such variations keep them identifiable, comply with general grammar rules and produce meaningful communicative effects. The cognitive processing of these variants is not necessarily more challenging with respect to unaltered idiomatic forms and is rather modulated by the interaction of many variables, including context, familiarity, semantic transparency, literal plausibility, verb voice and surface word order.

The directions in which the present work could be expanded are manifold. First of all, the computational and psycholinguistic investigations we carried out were just focused on the distinction between idiomatic and non-idiomatic expressions. As we discussed in Chapter 1, multiword units comprise various types of

constructions exhibiting different degrees of structural and semantic idiosyncrasy that are worth investigating in more detail. The computational indices of compositionality and the eye-tracking approach to passivization described here could thus be extended to the whole class of multiword expressions, to take into account also more fine-grained differences between the existing classes of lexicalized word combinations. In addition, the results on passive II processing and on the role of non-isomorphic semantic transparency in Chapter 3 call for further investigations on the relation between semantic and syntactic structure in processing. Finally, recent Natural Language Processing studies have begun to use gaze data to automatically identify multiword expressions (Rohanian et al., 2017). In this regard, the computational and eye-tracking evidence we collected could be combined in two directions. On the one hand, computational measures of compositionality could be used as predictors of reading data on idioms and multiword expressions to understand whether data automatically computed from corpus evidence actually possesses cognitive plausibility. On the other hand, gaze data could be used as features in idiom and multiword detection algorithms to complement them with information on the cognitive processing of the expressions they aim at classifying.

Appendix A

Items and scores from Chapter 2

A.1 90 target VN Italian idioms and non-idioms

Label	Item	Frequency
Idiom	Alzare le spalle ‘to shrug one’s shoulders’	773
Idiom	Andare a genio ‘to be to someone’s liking’ (lit. ‘to go to genius’)	547
Idiom	Andare in giro ‘to get about’ (lit. ‘to go in turn’)	8294
Idiom	Andare in porto ‘to come to a successful conclusion’ (lit. ‘to go into harbor’)	2765
Idiom	Aprire gli occhi ‘to open one’s eyes’	6306
Idiom	Aprire le porte ‘to open the floodgates’ (lit. ‘to open the doors’)	7734
Idiom	Arrivare al capolinea ‘to reach the end of the line’	517
Idiom	Brucciare le tappe ‘to rush into things’ (lit. ‘to burn the stops’)	461
Idiom	Bussare alla porta ‘to knock on someone’s door’	3303

Idiom	Cadere dal cielo ‘to be heaven-sent’ (lit. ‘to fall from the sky’)	924
Idiom	Cambiare aria ‘to have a change of scenery’ (lit. ‘to change air’)	812
Idiom	Cambiare colore ‘to change color’	1793
Idiom	Cambiare musica ‘to change the tune’ (lit. ‘to change music’)	1256
Idiom	Cambiare rotta ‘to change tack’ (lit. ‘to switch route’)	1337
Idiom	Cantare vittoria ‘to crow over one’s victory’ (lit. ‘to sing victory’)	899
Idiom	Capitare a tiro ‘to turn up within arm’s reach’ (lit. ‘to turn up within shooting distance’)	431
Idiom	Dare i numeri ‘to lose it’ (lit. ‘to give the numbers’)	1159
Idiom	Gettare la spugna ‘to throw in the towel’ (lit. ‘to throw the sponge’)	827
Idiom	Giocare in casa ‘to have home-court advantage’ (lit. ‘to play at home’)	1335
Idiom	Ingannare il tempo ‘to pass time’ (lit. ‘to deceive time’)	364
Idiom	Lasciare il campo ‘to leave the field’	2794
Idiom	Lasciare il segno ‘to leave the mark’	5289
Idiom	Mettere piede ‘to set foot’	4875
Idiom	Mostrare i denti ‘to show one’s teeth’	443
Idiom	Passare alla storia ‘to go down in history’ (lit. ‘to pass to history’)	2471
Idiom	Passare il segno ‘to overstep the mark’	763
Idiom	Passare la palla ‘to pass the ball’	821
Idiom	Passare per la testa ‘to cross someone’s mind’	1172
Idiom	Perdere il filo ‘to lose the thread’	834

Idiom	Perdere la bussola ‘to lose one’s bearings’ (lit. ‘to lose the compass’)	377
Idiom	Perdere la testa ‘to lose one’s head’	2306
Idiom	Prendere il largo ‘to shove off’ (lit. ‘to take the large’)	1155
Idiom	Preparare il terreno ‘to prepare the ground’	1198
Idiom	Salire alla ribalta ‘to come into the limelight’ (lit. ‘to go up to the front of the stage’)	424
Idiom	Spiegare la voce ‘to sing out loud’ (lit. ‘to deploy the voice’)	842
Idiom	Tirare la corda ‘to take things too far’ (lit. ‘to pull the rope’)	503
Idiom	Toccare il fondo ‘to hit rock bottom’ (lit. ‘to touch the bottom’)	1620
Idiom	Tornare alla carica ‘to return to the fray’ (lit. ‘to return to the charge’)	852
Idiom	Trovare la chiave ‘to find a solution’ (lit. ‘to find the key’)	950
Idiom	Vedere la luce ‘to see the light of day’ (lit. ‘to see the light’)	6266
Idiom	Venire a galla ‘to come to the surface’	1564
Idiom	Venire al mondo ‘to be born’ (lit. ‘to come to the world’)	1685
Idiom	Venire alla luce ‘to come to light’	3597
Idiom	Venire alle mani ‘to come to blows’ (lit. ‘to come to the hands’)	446
Idiom	Voltare pagina ‘to turn the page’	1889
Non-idiom	Abbassare il costo ‘to bring down the cost’	845
Non-idiom	Abbassare la guardia ‘to let one’s guard down’	1623
Non-idiom	Andare a casa ‘to go home’	8506
Non-idiom	Andare all’estero ‘to go abroad’	2771

Non-idiom	Andare in vacanza ‘to go on holiday’	4083
Non-idiom	Aprire un conto ‘to open up a bank account’	1226
Non-idiom	Ascoltare un discorso ‘to listen to a speech’	681
Non-idiom	Ascoltare una canzone ‘to listen to a song’	1152
Non-idiom	Chiedere le dimissioni ‘to demand the resignation’	1862
Non-idiom	Chiedere un risarcimento ‘to ask for a refund’	1975
Non-idiom	Chiedere una spiegazione ‘to ask for an explanation’	2564
Non-idiom	Chiudere l’anno ‘to close the year’	1176
Non-idiom	Chiudere un discorso ‘to close a matter’	806
Non-idiom	Chiudere una scuola ‘to shut down a school’	714
Non-idiom	Entrare in città ‘to get into town’	1596
Non-idiom	Entrare in crisi ‘to get into a crisis’	2256
Non-idiom	Entrare in ufficio ‘to get in the office’	746
Non-idiom	Entrare in un negozio ‘to get into a shop’	983
Non-idiom	Giocare a calcio ‘to play soccer’	1855
Non-idiom	Giocare a carte ‘to play cards’	1091
Non-idiom	Lasciare un incarico ‘to quit a job’	1017
Non-idiom	Lavorare in azienda ‘to work for a company’ (lit. ‘to work in a company’)	1070
Non-idiom	Leggere un libro ‘to read a book’	11889
Non-idiom	Mostrare interesse ‘to show interest’	1503
Non-idiom	Mostrare un’immagine ‘to show a picture’	2010
Non-idiom	Parlare di economia ‘to talk about economy’	822
Non-idiom	Parlare di politica ‘to talk about politics’	3190
Non-idiom	Piantare un albero ‘to plant a tree’	811
Non-idiom	Prendere un caffè ‘to grab a coffee’	1410
Non-idiom	Preparare la cena ‘to prepare dinner’	811
Non-idiom	Salire su un palco ‘to go on a stage’	2474

Non-idiom	Seguire un evento ‘to follow an event’	901
Non-idiom	Sentire un rumore ‘to hear a noise’	2348
Non-idiom	Sentire una voce ‘to hear a voice’	6406
Non-idiom	Tagliare un traguardo ‘to cross the line’ (lit. ‘to cut the finish line’)	1278
Non-idiom	Trovare un lavoro ‘to find a job’	8886
Non-idiom	Trovare un posto ‘to find a seat’	8636
Non-idiom	Trovare un’occupazione ‘to find employment’	1476
Non-idiom	Uscire da un’aula ‘to get out of a classroom’	775
Non-idiom	Uscire da una stanza ‘to get out of a room’	1389
Non-idiom	Uscire dal carcere ‘to get out of jail’	1066
Non-idiom	Vedere un film ‘to watch a movie’	11151
Non-idiom	Vedere una partita ‘to watch a match’	2648
Non-idiom	Vendere un libro ‘to sell a book’	920
Non-idiom	Vendere una casa ‘to sell a house’	875

Table A.1: List of the 90 VN Italian target expressions used for the experiments in Chapter 2. The dataset is composed of 45 idioms and 45 non-idioms. Raw frequency is taken from itWaC (1.9M tokens ca.; Baroni et al. 2009).

A.2 90 VN targets with best-model scores

Label	Item	Idiomatycity Rating	iMWN _{cos}		
			15 _{var} Centr _{no}	35 _{var} Centr _{no}	48 _{var} Centr _{orth}
Idiom	Alzare le spalle	3.67	0.1700	0.2480	0.2548
Idiom	Andare a genio	7.00	0.1168	0.1395	0.1200
Idiom	Andare in giro	1.67	0.2382	0.2658	0.2486
Idiom	Andare in porto	6.67	0.1642	0.2310	0.2493

Idiom	Aprire gli occhi	3.67	0.2770	0.3163	0.2241
Idiom	Aprire le porte	3.67	0.2559	0.3466	0.3005
Idiom	Arrivare al capolinea	4.00	0.1191	0.2220	0.2075
Idiom	Brucciare le tappe	6.67	0.0000	0.0000	0.0000
Idiom	Bussare alla porta	2.00	0.2137	0.2235	0.2104
Idiom	Cadere dal cielo	6.67	0.3096	0.3545	0.3048
Idiom	Cambiare aria	4.50	0.1830	0.2042	0.2061
Idiom	Cambiare colore	3.67	0.3468	0.3979	0.3807
Idiom	Cambiare musica	5.33	0.2143	0.2574	0.2501
Idiom	Cambiare rotta	5.00	0.2289	0.2656	0.2657
Idiom	Cantare vittoria	6.67	0.1219	0.2002	0.2136
Idiom	Capitare a tiro	6.00	0.1804	0.1999	0.1859
Idiom	Dare i numeri	6.67	0.2829	0.3157	0.3021
Idiom	Gettare la spugna	7.00	0.2022	0.2604	0.1974
Idiom	Giocare in casa	5.67	0.1774	0.1731	0.1841
Idiom	Ingannare il tempo	6.67	0.1546	0.1832	0.1403
Idiom	Lasciare il campo	3.67	0.1972	0.2242	0.2112
Idiom	Lasciare il segno	5.00	0.1529	0.2011	0.2342
Idiom	Mettere piede	4.00	0.2143	0.2501	0.2570
Idiom	Mostrare i denti	4.67	0.1823	0.2521	0.2342
Idiom	Passare alla storia	5.67	0.1694	0.1773	0.1343
Idiom	Passare il segno	6.33	0.1795	0.2217	0.1859
Idiom	Passare la palla	3.67	0.2611	0.3435	0.2791
Idiom	Passare per la testa	6.00	0.0792	0.1988	0.1359
Idiom	Perdere il filo	7.00	0.1244	0.1923	0.1904
Idiom	Perdere la bussola	5.00	0.1740	0.1594	0.1775
Idiom	Perdere la testa	7.00	0.1286	0.1840	0.1762
Idiom	Prendere il largo	5.67	0.3223	0.3804	0.3883

Idiom	Preparare il terreno	5.67	0.1244	0.1960	0.1909
Idiom	Salire alla ribalta	6.67	0.1716	0.1723	0.1073
Idiom	Spiegare la voce	4.00	0.1916	0.2097	0.1777
Idiom	Tirare la corda	5.33	0.1999	0.2857	0.2406
Idiom	Toccare il fondo	6.33	0.1428	0.1673	0.1620
Idiom	Tornare alla carica	6.33	0.1283	0.1957	0.1645
Idiom	Trovare la chiave	4.00	0.1874	0.2342	0.2091
Idiom	Vedere la luce	6.00	0.1935	0.2938	0.2935
Idiom	Venire a galla	5.33	0.2219	0.2245	0.2270
Idiom	Venire al mondo	4.67	0.1170	0.1263	0.1274
Idiom	Venire alla luce	4.33	0.1157	0.1435	0.1499
Idiom	Venire alle mani	5.33	0.1668	0.1952	0.2161
Idiom	Voltare pagina	5.00	0.1243	0.1746	0.1710
Non-id.	Abbassare il costo	1.67	0.4350	0.5494	0.4966
Non-id.	Abbassare la guardia	6.00	0.2265	0.2411	0.2087
Non-id.	Andare a casa	1.00	0.2838	0.3436	0.3182
Non-id.	Andare allestero	1.33	0.2719	0.5509	0.5743
Non-id.	Andare in vacanza	1.00	0.3184	0.3376	0.2843
Non-id.	Aprire un conto	2.67	0.3391	0.2809	0.2098
Non-id.	Ascoltare un discorso	1.67	0.2634	0.2693	0.2694
Non-id.	Ascoltare una canzone	1.00	0.3581	0.4160	0.4059
Non-id.	Chiedere le dimissioni	2.00	0.4107	0.3554	0.3639
Non-id.	Chiedere un risarcimento	1.67	0.4288	0.5913	0.5804
Non-id.	Chiedere una spiegazione	1.00	0.2667	0.3043	0.2981
Non-id.	Chiudere l'anno	6.00	0.2904	0.3155	0.2970
Non-id.	Chiudere un discorso	4.33	0.2030	0.2621	0.2420

Non-id.	Chiudere una scuola	1.00	0.2939	0.3990	0.3853
Non-id.	Entrare in città	1.67	0.1529	0.2105	0.2461
Non-id.	Entrare in crisi	4.33	0.1842	0.2260	0.2134
Non-id.	Entrare in ufficio	1.33	0.2842	0.2847	0.2666
Non-id.	Entrare in un negozio	1.33	0.1527	0.2121	0.2299
Non-id.	Giocare a calcio	1.00	0.3242	0.3724	0.4117
Non-id.	Giocare a carte	1.33	0.1473	0.1539	0.1437
Non-id.	Lasciare un incarico	2.33	0.3067	0.3671	0.3974
Non-id.	Lavorare in azienda	1.00	0.3142	0.5496	0.5454
Non-id.	Leggere un libro	1.00	0.2796	0.3971	0.4306
Non-id.	Mostrare interesse	1.67	0.3029	0.3567	0.3746
Non-id.	Mostrare un'immagine	1.00	0.2316	0.2868	0.2821
Non-id.	Parlare di economia	1.33	0.3098	0.4021	0.4152
Non-id.	Parlare di politica	1.00	0.3044	0.3526	0.3390
Non-id.	Piantare un albero	1.33	0.3204	0.3428	0.2986
Non-id.	Prendere un caffè	3.33	0.2875	0.3112	0.2645
Non-id.	Preparare la cena	1.33	0.2690	0.3196	0.3192
Non-id.	Salire su un palco	1.33	0.2845	0.3250	0.2602
Non-id.	Seguire un evento	2.67	0.1683	0.2010	0.2514
Non-id.	Sentire un rumore	1.00	0.3777	0.4233	0.3979
Non-id.	Sentire una voce	1.33	0.3369	0.3733	0.3803
Non-id.	Tagliare un traguardo	5.33	0.2358	0.2603	0.2634
Non-id.	Trovare un lavoro	1.00	0.4388	0.4751	0.4458
Non-id.	Trovare un posto	1.00	0.2305	0.2706	0.2609
Non-id.	Trovare un'occupazione	1.33	0.3552	0.5033	0.4996
Non-id.	Uscire da un'aula	1.33	0.3805	0.3981	0.3510
Non-id.	Uscire da una stanza	1.00	0.2323	0.2959	0.2570
Non-id.	Uscire dal carcere	2.33	0.4742	0.5539	0.4476

Non-id.	Vedere un film	2.00	0.3266	0.4527	0.4492
Non-id.	Vedere una partita	1.00	0.3262	0.4229	0.4729
Non-id.	Vendere un libro	1.00	0.3758	0.4253	0.4016
Non-id.	Vendere una casa	1.00	0.4392	0.6469	0.6336

Table A.2: Mean human-elicited idiomaticity ratings and best-model cosines for the 90 target VN idioms and non-idioms from Chapter 2. The three best models for which cosines are reported are the models with the highest IAP, F-measure at the median and Spearman’s correlation with the idiomaticity ratings respectively.

A.3 24 target AN Italian idioms and non-idioms

Label	Item	Frequency
Idiom	Alte sfere ‘high places’ (lit. ‘high spheres’)	21
Idiom	Colpo basso ‘low blow’	39
Idiom	Doppio senso ‘double meaning’	53
Idiom	Faccia tosta ‘boldness’ (lit. ‘tough face’)	49
Idiom	Filo rosso ‘common thread’ (lit. ‘red thread’)	110
Idiom	Passo falso ‘false step’	61
Idiom	Pecora nera ‘black sheep’	30
Idiom	Prima serata ‘prime time’ (lit. ‘first evening’)	75
Idiom	Punto debole ‘weak point’	194
Idiom	Punto fermo ‘fundamental point’ (lit. ‘still point’)	117
Idiom	Terzo mondo ‘third world’	67
Idiom	Testa calda ‘hothead’	30
Non-idiom	Crescita rapida ‘rapid growth’	16
Non-idiom	Famoso scrittore ‘famous writer’	15
Non-idiom	Giovane donna ‘young woman’	291
Non-idiom	Governo italiano ‘Italian government’	149

Non-idiom	Grande città ‘big city’	276
Non-idiom	Grande importanza ‘great importance’	75
Non-idiom	Gruppo numeroso ‘numerous group’	19
Non-idiom	Lungo periodo ‘long period’	207
Non-idiom	Nuovo governo ‘new government’	203
Non-idiom	Nuova legge ‘new law’	854
Non-idiom	Proposta concreta ‘concrete proposal’	110
Non-idiom	Ragazzo bello ‘handsome boy’	242

Table A.3: List of the 24 AN Italian target expressions used for the experiments in Chapter 2. The dataset is composed of 12 idioms and 12 non-idioms. Raw frequency is taken from itWaC (1.9M tokens ca.; Baroni et al. 2009).

A.4 24 AN targets with best-model scores

Label	Item	Idiomatcity		Struct.	Additive
		iMWN _{syn}	Rating	Centr _{orth}	
		Mean _{orth}			
Idiom	Alte sfere	6.33	0.0283	0.0000	0.2726
Idiom	Colpo basso	6.33	0.0000	0.0000	0.3085
Idiom	Doppio senso	5.11	0.0683	0.0023	0.3159
Idiom	Faccia tosta	6.67	0.0000	0.0012	0.3980
Idiom	Filo rosso	5.78	0.0334	0.0024	0.2826
Idiom	Passo falso	6.56	0.0590	0.0000	0.2917
Idiom	Pecora nera	6.33	0.0000	0.0074	0.3512
Idiom	Prima serata	4.00	0.0578	0.0063	0.5513
Idiom	Punto debole	6.56	0.0000	0.0000	0.4847
Idiom	Punto fermo	6.22	0.0793	0.0026	0.3589
Idiom	Terzo mondo	6.11	0.0621	0.0240	0.4593

Idiom	Testa calda	6.89	0.3916	0.0096	0.3641
Non-idiom	Crescita rapida	2.33	0.0835	0.0108	0.3848
Non-idiom	Famoso scrittore	1.22	0.1066	0.0116	0.3743
Non-idiom	Giovane donna	1.56	0.0883	0.0083	0.6925
Non-idiom	Governo italiano	1.33	0.0856	0.0153	0.5675
Non-idiom	Grande città	2.33	0.1306	0.0134	0.5670
Non-idiom	Grande importanza	1.44	0.1253	0.0142	0.4256
Non-idiom	Gruppo numeroso	1.44	0.0588	0.0039	0.4275
Non-idiom	Lungo periodo	2.11	0.1101	0.0102	0.4752
Non-idiom	Nuova legge	1.78	0.1522	0.0226	0.5958
Non-idiom	Nuovo governo	1.11	0.0737	0.0140	0.6915
Non-idiom	Proposta concreta	2.78	0.0799	0.0088	0.4873
Non-idiom	Ragazzo bello	1.22	0.1475	0.0099	0.6199

Table A.4: Mean human-elicited idiomaticity ratings and best-model cosines for the 24 target AN idioms and non-idioms from Chapter 2. The three best models for which cosines are reported are the model with the highest IAP and F-measure at the median ($iMWN_{syn}$ CentAOId_{orth}), the model with the highest Spearman’s correlation with the idiomaticity ratings (Structured DSM Mean_{orth}) and the non-variant-based Additive model respectively.

Appendix B

Items and stimuli of the eye-tracking studies in Chapter 3

B.1 Items: 60 VN idioms and matched literals

Type	Item
Idiom	Abbassare la cresta ‘to get off one’s high horse’ (lit. ‘to lower the crest’)
Literal	Abbassare lo stereo ‘to turn down the stereo’
Idiom	Accusare il colpo ‘to suffer the blow’
Literal	Accusare la banca ‘to accuse the bank’
Idiom	Allungare il muso ‘to pull a long face’ (lit. ‘to stretch the snout’)
Literal	Allungare la gita ‘to extend the trip’
Idiom	Alzare la voce ‘to raise one’s voice’
Literal	Alzare il libro ‘to lift the book’
Idiom	Aprire gli occhi ‘to open one’s eyes’
Literal	Aprire uno studio ‘to open an office’
Idiom	Attaccare un bottone ‘to buttonhole (someone)’ (lit. ‘to attach a button’)
Literal	Attaccare la lampada ‘to plug the lamp in’
Idiom	Avvelenare il fegato ‘to make (someone) angry’ (lit. ‘to poison the liver’)

Literal	Avvelenare il rivale ‘to poison the rival’
Idiom	Battere la fiacca ‘to slack off’ (lit. ‘to beat the weariness’)
Literal	Battere lo stinco ‘to hit the shin’
Idiom	Bruciare le tappe ‘to rush into things’ (lit. ‘to burn down the stops’)
Literal	Bruciare la carne ‘to burn the meat’
Idiom	Chiudere il becco ‘to shut one’s mouth’ (lit. ‘to shut the beak’)
Literal	Chiudere l’uscio ‘to close the outside door’
Idiom	Contare le pecore ‘to count sheep’ (lit. ‘to count the sheeps’)
Literal	Contare gli alunni ‘to count the pupils’
Idiom	Coprire le spalle ‘to have (someone’s) back’ (lit. ‘to cover the shoulders’)
Literal	Coprire il tavolo ‘to cover the table’
Idiom	Cucire le labbra ‘to seal (someone’s) lips’
Literal	Cucire la manica ‘to sew the sleeve’
Idiom	Dare i numeri ‘to freak out’ (lit. ‘to give the numbers’)
Literal	Dare un titolo ‘to give a title’
Idiom	Fare una croce ‘to forget (about something)’ (lit. ‘to make a cross’)
Literal	Fare una piega ‘to fold’
Idiom	Ferire il cuore ‘to hurt (someone’s) feelings’ (lit. ‘to hurt the heart’)
Literal	Ferire un piede ‘to hurt a foot’
Idiom	Ficcare il naso ‘to stick (one’s) nose’
Literal	Ficcare dei pali ‘to stick some poles’
Idiom	Frenare la lingua ‘to hold one’s tongue’
Literal	Frenare la strage ‘to contain the massacre’
Idiom	Gettare la spugna ‘to throw in the towel’ (lit. ‘to throw the sponge away’)
Literal	Gettare il fucile ‘to throw the shotgun away’
Idiom	Imparare la lezione ‘to learn the lesson’
Literal	Imparare una poesia ‘to learn a poem’
Idiom	Indorare la pillola ‘to gild the pill’

Literal	Indorare la cornice ‘to gild the frame’
Idiom	Ingoiare il rospo ‘to swallow the bitter pill’ (lit. ‘to swallow the toad’)
Literal	Ingoiare la zuppa ‘to swallow the soup’
Idiom	Invertire la rotta ‘to turn the tide’ (lit. ‘to reverse the course’)
Literal	Invertire la marcia ‘to reverse the direction of motion’
Idiom	Lasciare il segno ‘to leave the mark’
Literal	Lasciare la spesa ‘to leave one’s groceries’
Idiom	Legare le mani ‘to tie (someone’s) hands’
Literal	Legare una rete ‘to tie a net’
Idiom	Lustrare le scarpe ‘to flatter’ (lit. ‘to shine the shoes’)
Literal	Lustrare i mobili ‘to shine the furniture’
Idiom	Mancare il bersaglio ‘to miss the target’
Literal	Mancare la votazione ‘to miss the voting’
Idiom	Mangiare la foglia ‘to smell a rat’ (lit. ‘to eat the leaf’)
Literal	Mangiare un panino ‘to eat a sandwich’
Idiom	Mettere le corna ‘to cheat (on someone)’ (lit. ‘to put the horns’)
Literal	Mettere le pizze ‘to put the pizzas’
Idiom	Montare la testa ‘to give (someone) a big head’ (lit. ‘to mount the head’)
Literal	Montare la scena ‘to assemble the scenery’
Idiom	Mozzare il fiato ‘to take (someone’s) breath away’ (lit. ‘to cut off the breath’)
Literal	Mozzare il collo ‘to cut off the neck’
Idiom	Passare il testimone ‘to pass the baton’
Literal	Passare il biglietto ‘to pass the ticket’
Idiom	Perdere il filo ‘to lose the thread’
Literal	Perdere una foto ‘to lose a photo’
Idiom	Piantare le tende ‘to settle down’ (lit. ‘to pitch the tents’)
Literal	Piantare delle palme ‘to plant some palm trees’

Idiom	Portare i pantaloni ‘to rule in a family’ (lit. ‘to wear the trousers’)
Literal	Portare il cappello ‘to wear the hat’
Idiom	Prendere una cotta ‘to get a crush’ (lit. ‘to take a cooked’)
Literal	Prendere una felpa ‘to take a sweater’
Idiom	Preparare il terreno ‘to prepare the ground’
Literal	Preparare il viaggio ‘to prepare the trip’
Idiom	Puntare il dito ‘to point an accusing finger’ (lit. ‘to point the finger’)
Literal	Puntare la spada ‘to point the sword’
Idiom	Raggiungere il traguardo ‘to reach one’s goal’ (lit. ‘to reach the finish line’)
Literal	Raggiungere l’aeroporto ‘to reach the airport’
Idiom	Reggere la candela ‘to be a third wheel’ (lit. ‘to hold the candle’)
Literal	Reggere il tendone ‘to hold up the marquee’
Idiom	Rischiare le penne ‘to risk one’s life’ (lit. ‘to risk the feathers’)
Literal	Rischiare dei falli ‘to risk some fouls’
Idiom	Rivoltare la frittata ‘to turn the tables’ (lit. ‘to flip the omelette’)
Literal	Rivoltare la tovaglia ‘to turn the tablecloth inside out’
Idiom	Rompere le scatole ‘to get on (someone’s) nerves’ (lit. ‘to smash up the boxes’)
Literal	Rompere gli occhiali ‘to break the glasses’
Idiom	Saltare il fosso ‘to take the plunge’ (lit. ‘to jump the ditch’)
Literal	Saltare la corsia ‘to jump over the lane’
Idiom	Salvare la faccia ‘to save (someone’s) face’
Literal	Salvare l’affare ‘to save the business’
Idiom	Scavare la fossa ‘to dig (someone) an early grave’ (lit. ‘to dig the grave’)
Literal	Scavare un solco ‘to dig a furrow’
Idiom	Scoprire le carte ‘to tip one’s hand’ (lit. ‘to uncover the cards’)
Literal	Scoprire il volto ‘to uncover the face’

Idiom	Segare le gambe ‘to hamstring’ (lit. ‘to saw the legs’)
Literal	Segare le catene ‘to saw the chains’
Idiom	Spezzare una lancia ‘to put in a good word’ (lit. ‘to break the spear’)
Literal	Spezzare il calice ‘to break the stem glass’
Idiom	Sputare i polmoni ‘to toil away’ (lit. ‘to spit the lungs out’)
Literal	Sputare un insetto ‘to spit an insect’
Idiom	Staccare la spina ‘to take a break’ (lit. ‘to pull the plug’)
Literal	Staccare la sella ‘to remove the saddle’
Idiom	Stringere i denti ‘to grit one’s teeth’
Literal	Stringere le ruote ‘to screw the wheels’
Idiom	Subire uno scacco ‘to suffer a setback’ (lit. ‘to suffer a checkmate’)
Literal	Subire uno scippo ‘to suffer a mugging’
Idiom	Tagliare la corda ‘to slip away’ (lit. ‘to cut the rope’)
Literal	Tagliare la barba ‘to trim the beard’
Idiom	Tentare la sorte ‘to try one’s luck’
Literal	Tentare un furto ‘to attempt a robbery’
Idiom	Tirare la corda ‘to take things too far’ (lit. ‘to pull the rope’)
Literal	Tirare il freno ‘to pull the brake’
Idiom	Trovare la chiave ‘to find the key’
Literal	Trovare del denaro ‘to find some money’
Idiom	Urtare i nervi ‘to get on (someone’s) nerves’ (lit. ‘to hit the nerves’)
Literal	Urtare il polso ‘to hit the wrist’
Idiom	Vedere le stelle ‘to see stars’
Literal	Vedere la rapina ‘to see the robbery’
Idiom	Vuotare il sacco ‘to spill the beans’ (lit. ‘to empty the sack’)
Literal	Vuotare il pozzo ‘to empty the well’

Table B.1: 60 Italian verb-determiner-noun idioms and novel literal matched phrases used as items in the two eye-tracking studies in Chapter 3. Literal phrases are composed of the same idiom verbs and new length- and frequency-matched nouns.

B.2 Idiom normative data

Idiom	Familiarity	Meaning Knowledge	Transparency	Literal Plausibility
Abbassare la cresta	6.60	100%	4.80	2.60
Accusare il colpo	6.13	93%	5.10	2.80
Allungare il muso	4.53	33%	5.30	2.00
Alzare la voce	6.93	100%	5.60	4.20
Aprire gli occhi	6.87	100%	5.60	5.80
Attaccare un bottone	5.60	100%	2.10	4.00
Avvelenare il fegato	4.47	73%	3.90	2.50
Battere la fiacca	5.87	93%	2.70	2.10
Brucciare le tappe	6.47	100%	4.30	2.10
Chiudere il becco	6.60	100%	5.70	2.60
Contare le pecore	5.87	80%	2.50	4.60
Coprire le spalle	6.13	100%	5.30	3.60
Cucire le labbra	3.87	80%	5.50	2.10
Dare i numeri	6.93	100%	2.10	3.90
Fare una croce	4.27	66%	3.50	3.20
Ferire il cuore	5.20	93%	5.50	3.40
Ficcare il naso	6.73	100%	4.30	2.40
Frenare la lingua	5.73	100%	5.90	2.40
Gettare la spugna	6.73	100%	2.90	3.30

Imparare la lezione	6.80	100%	6.10	5.80
Indorare la pillola	4.87	100%	5.00	1.87
Ingoiare il rospo	6.00	93%	3.50	2.70
Invertire la rotta	5.60	100%	6.00	3.50
Lasciare il segno	6.73	100%	5.80	4.70
Legare le mani	4.27	80%	5.40	4.40
Lustrare le scarpe	4.07	80%	4.90	4.80
Mancare il bersaglio	6.53	100%	5.90	5.60
Mangiare la foglia	4.73	53%	1.50	4.10
Mettere le corna	7.00	100%	2.40	2.40
Montare la testa	4.33	73%	3.30	2.60
Mozzare il fiato	5.00	86%	5.90	2.60
Passare il testimone	5.87	80%	5.50	4.60
Perdere il filo	6.67	100%	4.60	4.30
Piantare le tende	3.87	80%	4.90	4.10
Portare i pantaloni	5.67	100%	4.40	5.80
Prendere una cotta	6.47	100%	2.20	2.20
Preparare il terreno	4.87	93%	5.30	4.70
Puntare il dito	6.93	93%	6.20	5.40
Raggiungere il traguardo	6.40	100%	6.90	5.70
Reggere la candela	5.53	73%	2.90	5.40
Rischiare le penne	5.60	100%	3.40	2.00
Rivoltare la frittata	5.53	93%	4.70	4.50
Rompere le scatole	7.00	100%	1.40	3.90
Saltare il fosso	4.07	0%	3.70	4.90
Salvare la faccia	5.93	100%	4.20	3.20
Scavare la fossa	5.27	100%	4.30	4.50
Scoprire le carte	5.93	100%	4.70	5.10

Segare le gambe	5.20	80%	3.50	3.10
Spezzare una lancia	5.73	80%	3.00	2.70
Sputare i polmoni	3.87	60%	4.90	1.90
Staccare la spina	6.20	73%	4.40	5.80
Stringere i denti	6.67	100%	5.30	5.40
Subire uno scacco	4.07	100%	5.50	2.90
Tagliare la corda	6.67	100%	2.40	3.30
Tentare la sorte	6.07	100%	5.60	2.20
Tirare la corda	5.47	66%	3.50	4.30
Trovare la chiave	4.73	73%	5.30	5.60
Urtare i nervi	6.20	100%	5.30	2.20
Vedere le stelle	6.53	86%	3.20	5.30
Vuotare il sacco	6.20	100%	3.70	2.90

Table B.2: Mean familiarity, meaning knowledge, semantic transparency and literal plausibility judgments for the 60 Italian verb-determiner-noun idioms used as items in the two eye-tracking studies in Chapter 3.

B.3 Naturalness and cloze probability ratings for experiment 1

Condition	Item	Naturalness	Cloze w1	Cloze w2
Id-Act	Abbassare la cresta/lo stereo	5.50	0%	30%
Id-Pass1	Abbassare la cresta/lo stereo	1.60	0%	10%
Id-Pass2	Abbassare la cresta/lo stereo	6.90	0%	0%
Lit-Act	Abbassare la cresta/lo stereo	5.80	0%	10%
Lit-Pass1	Abbassare la cresta/lo stereo	4.50	0%	10%
Lit-Pass2	Abbassare la cresta/lo stereo	4.30	0%	10%

Id-Act	Accusare il colpo/la banca	6.30	0%	10%
Id-Pass1	Accusare il colpo/la banca	3.80	0%	0%
Id-Pass2	Accusare il colpo/la banca	2.20	0%	0%
Lit-Act	Accusare il colpo/la banca	6.30	0%	0%
Lit-Pass1	Accusare il colpo/la banca	5.50	0%	0%
Lit-Pass2	Accusare il colpo/la banca	2.40	0%	0%
Id-Act	Allungare il muso/la gita	6.00	0%	0%
Id-Pass1	Allungare il muso/la gita	2.00	0%	0%
Id-Pass2	Allungare il muso/la gita	2.50	0%	0%
Lit-Act	Allungare il muso/la gita	6.20	0%	0%
Lit-Pass1	Allungare il muso/la gita	4.40	0%	0%
Lit-Pass2	Allungare il muso/la gita	3.60	0%	0%
Id-Act	Alzare la voce/il libro	6.70	0%	20%
Id-Pass1	Alzare la voce/il libro	3.70	0%	0%
Id-Pass2	Alzare la voce/il libro	3.00	0%	0%
Lit-Act	Alzare la voce/il libro	5.70	0%	0%
Lit-Pass1	Alzare la voce/il libro	3.20	0%	0%
Lit-Pass2	Alzare la voce/il libro	2.40	0%	0%
Id-Act	Aprire gli occhi/uno studio	6.40	0%	90%
Id-Pass1	Aprire gli occhi/uno studio	2.10	0%	0%
Id-Pass2	Aprire gli occhi/uno studio	1.90	0%	20%
Lit-Act	Aprire gli occhi/uno studio	6.20	0%	20%
Lit-Pass1	Aprire gli occhi/uno studio	2.60	0%	0%
Lit-Pass2	Aprire gli occhi/uno studio	3.80	0%	40%
Id-Act	Attaccare un bottone/la lampada	3.10	0%	20%
Id-Pass1	Attaccare un bottone/la lampada	1.40	0%	0%
Id-Pass2	Attaccare un bottone/la lampada	1.70	0%	0%
Lit-Act	Attaccare un bottone/la lampada	6.00	0%	10%

Lit-Pass1	Attaccare un bottone/la lampada	2.90	0%	60%
Lit-Pass2	Attaccare un bottone/la lampada	3.70	0%	20%
Id-Act	Avvelenare il fegato/il rivale	5.80	0%	0%
Id-Pass1	Avvelenare il fegato/il rivale	2.20	0%	0%
Id-Pass2	Avvelenare il fegato/il rivale	1.30	0%	0%
Lit-Act	Avvelenare il fegato/il rivale	6.40	0%	0%
Lit-Pass1	Avvelenare il fegato/il rivale	6.20	0%	0%
Lit-Pass2	Avvelenare il fegato/il rivale	3.20	0%	0%
Id-Act	Battere la fiacca/lo stinco	5.30	0%	20%
Id-Pass1	Battere la fiacca/lo stinco	1.90	0%	40%
Id-Pass2	Battere la fiacca/lo stinco	2.60	0%	40%
Lit-Act	Battere la fiacca/lo stinco	6.00	0%	0%
Lit-Pass1	Battere la fiacca/lo stinco	2.30	0%	0%
Lit-Pass2	Battere la fiacca/lo stinco	2.10	0%	0%
Id-Act	Brucciare le tappe/la carne	6.00	0%	60%
Id-Pass1	Brucciare le tappe/la carne	2.50	0%	10%
Id-Pass2	Brucciare le tappe/la carne	4.40	0%	20%
Lit-Act	Brucciare le tappe/la carne	6.50	0%	0%
Lit-Pass1	Brucciare le tappe/la carne	3.80	0%	10%
Lit-Pass2	Brucciare le tappe/la carne	2.90	0%	0%
Id-Act	Chiudere il becco/l'uscio	6.80	0%	0%
Id-Pass1	Chiudere il becco/l'uscio	3.40	0%	30%
Id-Pass2	Chiudere il becco/l'uscio	2.00	0%	0%
Lit-Act	Chiudere il becco/l'uscio	5.30	0%	0%
Lit-Pass1	Chiudere il becco/l'uscio	3.60	0%	30%
Lit-Pass2	Chiudere il becco/l'uscio	2.20	0%	20%
Id-Act	Contare le pecore/gli alunni	6.40	0%	30%
Id-Pass1	Contare le pecore/gli alunni	2.20	0%	10%

Id-Pass2	Contare le pecore/gli alunni	3.10	0%	0%
Lit-Act	Contare le pecore/gli alunni	6.50	0%	20%
Lit-Pass1	Contare le pecore/gli alunni	5.40	0%	0%
Lit-Pass2	Contare le pecore/gli alunni	3.80	0%	0%
Id-Act	Coprire le spalle/il tavolo	6.10	0%	0%
Id-Pass1	Coprire le spalle/il tavolo	3.00	0%	30%
Id-Pass2	Coprire le spalle/il tavolo	1.80	0%	0%
Lit-Act	Coprire le spalle/il tavolo	6.50	0%	20%
Lit-Pass1	Coprire le spalle/il tavolo	4.60	10%	0%
Lit-Pass2	Coprire le spalle/il tavolo	4.00	0%	10%
Id-Act	Cucire le labbra/la manica	5.70	0%	10%
Id-Pass1	Cucire le labbra/la manica	1.70	0%	10%
Id-Pass2	Cucire le labbra/la manica	2.60	0%	0%
Lit-Act	Cucire le labbra/la manica	6.50	0%	0%
Lit-Pass1	Cucire le labbra/la manica	3.80	0%	10%
Lit-Pass2	Cucire le labbra/la manica	3.50	0%	10%
Id-Act	Dare i numeri/un titolo	6.20	0%	50%
Id-Pass1	Dare i numeri/un titolo	2.10	0%	0%
Id-Pass2	Dare i numeri/un titolo	2.00	0%	10%
Lit-Act	Dare i numeri/un titolo	5.90	0%	0%
Lit-Pass1	Dare i numeri/un titolo	4.10	0%	10%
Lit-Pass2	Dare i numeri/un titolo	3.20	0%	0%
Id-Act	Fare una croce/una piega	6.20	0%	0%
Id-Pass1	Fare una croce/una piega	2.80	0%	0%
Id-Pass2	Fare una croce/una piega	2.60	0%	0%
Lit-Act	Fare una croce/una piega	6.40	0%	0%
Lit-Pass1	Fare una croce/una piega	3.30	0%	20%
Lit-Pass2	Fare una croce/una piega	6.70	10%	0%

Id-Act	Ferire il cuore/un piede	5.50	0%	20%
Id-Pass1	Ferire il cuore/un piede	2.30	0%	0%
Id-Pass2	Ferire il cuore/un piede	2.30	0%	0%
Lit-Act	Ferire il cuore/un piede	2.20	0%	0%
Lit-Pass1	Ferire il cuore/un piede	2.60	0%	0%
Lit-Pass2	Ferire il cuore/un piede	3.00	0%	0%
Id-Act	Ficcare il naso/dei pali	6.50	0%	60%
Id-Pass1	Ficcare il naso/dei pali	1.90	0%	0%
Id-Pass2	Ficcare il naso/dei pali	1.80	0%	60%
Lit-Act	Ficcare il naso/dei pali	6.50	0%	10%
Lit-Pass1	Ficcare il naso/dei pali	3.40	0%	0%
Lit-Pass2	Ficcare il naso/dei pali	4.10	0%	10%
Id-Act	Frenare la lingua/la strage	6.30	10%	30%
Id-Pass1	Frenare la lingua/la strage	1.60	0%	20%
Id-Pass2	Frenare la lingua/la strage	2.10	0%	0%
Lit-Act	Frenare la lingua/la strage	5.20	0%	0%
Lit-Pass1	Frenare la lingua/la strage	3.60	0%	0%
Lit-Pass2	Frenare la lingua/la strage	4.70	0%	0%
Id-Act	Gettare la spugna/il fucile	6.90	0%	40%
Id-Pass1	Gettare la spugna/il fucile	2.60	0%	20%
Id-Pass2	Gettare la spugna/il fucile	3.30	0%	60%
Lit-Act	Gettare la spugna/il fucile	6.90	0%	0%
Lit-Pass1	Gettare la spugna/il fucile	6.40	0%	10%
Lit-Pass2	Gettare la spugna/il fucile	3.90	0%	0%
Id-Act	Imparare la lezione/una poesia	6.20	0%	80%
Id-Pass1	Imparare la lezione/una poesia	3.50	0%	0%
Id-Pass2	Imparare la lezione/una poesia	3.20	0%	50%
Lit-Act	Imparare la lezione/una poesia	6.30	0%	10%

Lit-Pass1	Imparare la lezione/una poesia	5.20	0%	0%
Lit-Pass2	Imparare la lezione/una poesia	4.00	0%	20%
Id-Act	Indorare la pillola/cornice	6.50	0%	80%
Id-Pass1	Indorare la pillola/cornice	2.80	0%	20%
Id-Pass2	Indorare la pillola/cornice	3.20	0%	80%
Lit-Act	Indorare la pillola/cornice	5.20	0%	10%
Lit-Pass1	Indorare la pillola/cornice	2.40	0%	0%
Lit-Pass2	Indorare la pillola/cornice	2.20	0%	0%
Id-Act	Ingoiare il rospo/la zuppa	6.60	0%	70%
Id-Pass1	Ingoiare il rospo/la zuppa	2.70	0%	0%
Id-Pass2	Ingoiare il rospo/la zuppa	3.30	0%	30%
Lit-Act	Ingoiare il rospo/la zuppa	6.50	0%	0%
Lit-Pass1	Ingoiare il rospo/la zuppa	3.00	0%	0%
Lit-Pass2	Ingoiare il rospo/la zuppa	2.40	0%	0%
Id-Act	Invertire la rotta/la marcia	5.80	0%	70%
Id-Pass1	Invertire la rotta/la marcia	2.80	0%	0%
Id-Pass2	Invertire la rotta/la marcia	3.20	0%	40%
Lit-Act	Invertire la rotta/la marcia	6.20	0%	40%
Lit-Pass1	Invertire la rotta/la marcia	2.20	10%	20%
Lit-Pass2	Invertire la rotta/la marcia	2.80	0%	20%
Id-Act	Lasciare il segno/la spesa	5.20	0%	0%
Id-Pass1	Lasciare il segno/la spesa	2.70	0%	10%
Id-Pass2	Lasciare il segno/la spesa	3.20	0%	0%
Lit-Act	Lasciare il segno/la spesa	6.80	10%	0%
Lit-Pass1	Lasciare il segno/la spesa	3.60	0%	0%
Lit-Pass2	Lasciare il segno/la spesa	3.40	10%	0%
Id-Act	Legare le mani/una rete	5.50	0%	20%
Id-Pass1	Legare le mani/una rete	2.20	0%	0%

Id-Pass2	Legare le mani/una rete	1.30	0%	50%
Lit-Act	Legare le mani/una rete	6.60	0%	0%
Lit-Pass1	Legare le mani/una rete	4.80	0%	0%
Lit-Pass2	Legare le mani/una rete	3.70	0%	0%
Id-Act	Lustrare le scarpe/i mobili	6.60	0%	60%
Id-Pass1	Lustrare le scarpe/i mobili	2.70	0%	0%
Id-Pass2	Lustrare le scarpe/i mobili	2.10	0%	90%
Lit-Act	Lustrare le scarpe/i mobili	6.10	0%	0%
Lit-Pass1	Lustrare le scarpe/i mobili	4.40	0%	0%
Lit-Pass2	Lustrare le scarpe/i mobili	3.50	0%	0%
Id-Act	Mancare il bersaglio/la votazione	5.80	0%	40%
Id-Pass1	Mancare il bersaglio/la votazione	3.00	0%	30%
Id-Pass2	Mancare il bersaglio/la votazione	4.10	0%	10%
Lit-Act	Mancare il bersaglio/la votazione	5.80	0%	0%
Lit-Pass1	Mancare il bersaglio/la votazione	2.70	0%	0%
Lit-Pass2	Mancare il bersaglio/la votazione	2.40	0%	0%
Id-Act	Mangiare la foglia/un panino	6.30	10%	20%
Id-Pass1	Mangiare la foglia/un panino	2.50	0%	50%
Id-Pass2	Mangiare la foglia/un panino	1.60	0%	20%
Lit-Act	Mangiare la foglia/un panino	6.70	20%	30%
Lit-Pass1	Mangiare la foglia/un panino	2.20	10%	0%
Lit-Pass2	Mangiare la foglia/un panino	2.00	0%	50%
Id-Act	Mettere le corna/le pizze	6.60	0%	30%
Id-Pass1	Mettere le corna/le pizze	5.30	0%	10%
Id-Pass2	Mettere le corna/le pizze	2.30	0%	0%
Lit-Act	Mettere le corna/le pizze	6.10	0%	0%
Lit-Pass1	Mettere le corna/le pizze	4.40	0%	10%
Lit-Pass2	Mettere le corna/le pizze	3.00	0%	0%

Id-Act	Montare la testa/la scena	3.60	0%	0%
Id-Pass1	Montare la testa/la scena	1.50	0%	0%
Id-Pass2	Montare la testa/la scena	2.10	0%	0%
Lit-Act	Montare la testa/la scena	6.90	0%	0%
Lit-Pass1	Montare la testa/la scena	4.90	0%	0%
Lit-Pass2	Montare la testa/la scena	4.90	0%	0%
Id-Act	Mozzare il fiato/il collo	6.00	0%	50%
Id-Pass1	Mozzare il fiato/il collo	2.10	0%	0%
Id-Pass2	Mozzare il fiato/il collo	1.60	0%	40%
Lit-Act	Mozzare il fiato/il collo	6.20	0%	30%
Lit-Pass1	Mozzare il fiato/il collo	3.40	0%	0%
Lit-Pass2	Mozzare il fiato/il collo	2.80	0%	10%
Id-Act	Passare il testimone/il biglietto	5.90	0%	0%
Id-Pass1	Passare il testimone/il biglietto	4.20	0%	0%
Id-Pass2	Passare il testimone/il biglietto	3.80	0%	20%
Lit-Act	Passare il testimone/il biglietto	6.20	0%	0%
Lit-Pass1	Passare il testimone/il biglietto	4.60	0%	0%
Lit-Pass2	Passare il testimone/il biglietto	2.70	0%	0%
Id-Act	Perdere il filo/una foto	2.70	0%	10%
Id-Pass1	Perdere il filo/una foto	2.00	0%	0%
Id-Pass2	Perdere il filo/una foto	3.60	0%	0%
Lit-Act	Perdere il filo/una foto	6.60	0%	0%
Lit-Pass1	Perdere il filo/una foto	4.30	0%	0%
Lit-Pass2	Perdere il filo/una foto	3.50	0%	0%
Id-Act	Piantare le tende/delle palme	6.70	0%	0%
Id-Pass1	Piantare le tende/delle palme	3.70	0%	0%
Id-Pass2	Piantare le tende/delle palme	2.80	0%	0%
Lit-Act	Piantare le tende/delle palme	6.80	0%	0%

Lit-Pass1	Piantare le tende/delle palme	4.10	0%	40%
Lit-Pass2	Piantare le tende/delle palme	4.00	0%	0%
Id-Act	Portare i pantaloni/il cappello	5.60	0%	10%
Id-Pass1	Portare i pantaloni/il cappello	2.70	0%	0%
Id-Pass2	Portare i pantaloni/il cappello	1.40	0%	0%
Lit-Act	Portare i pantaloni/il cappello	6.50	0%	0%
Lit-Pass1	Portare i pantaloni/il cappello	2.40	0%	0%
Lit-Pass2	Portare i pantaloni/il cappello	2.40	0%	0%
Id-Act	Prendere una cotta/una felpa	6.10	0%	0%
Id-Pass1	Prendere una cotta/una felpa	2.30	0%	20%
Id-Pass2	Prendere una cotta/una felpa	2.00	0%	0%
Lit-Act	Prendere una cotta/una felpa	6.90	0%	0%
Lit-Pass1	Prendere una cotta/una felpa	3.20	0%	0%
Lit-Pass2	Prendere una cotta/una felpa	3.60	10%	0%
Id-Act	Preparare il terreno/il viaggio	6.00	10%	0%
Id-Pass1	Preparare il terreno/il viaggio	3.60	0%	0%
Id-Pass2	Preparare il terreno/il viaggio	3.70	0%	0%
Lit-Act	Preparare il terreno/il viaggio	6.40	0%	0%
Lit-Pass1	Preparare il terreno/il viaggio	4.80	0%	0%
Lit-Pass2	Preparare il terreno/il viaggio	3.90	0%	0%
Id-Act	Puntare il dito/la spada	3.90	0%	50%
Id-Pass1	Puntare il dito/la spada	2.20	0%	0%
Id-Pass2	Puntare il dito/la spada	1.90	0%	80%
Lit-Act	Puntare il dito/la spada	6.40	0%	0%
Lit-Pass1	Puntare il dito/la spada	4.30	0%	0%
Lit-Pass2	Puntare il dito/la spada	2.80	0%	0%
Id-Act	Raggiungere il traguardo/l'aeroporto	5.80	0%	20%
Id-Pass1	Raggiungere il traguardo/l'aeroporto	3.70	0%	60%

Id-Pass2	Raggiungere il traguardo/l'aeroporto	5.20	10%	20%
Lit-Act	Raggiungere il traguardo/l'aeroporto	7.00	0%	0%
Lit-Pass1	Raggiungere il traguardo/l'aeroporto	3.60	0%	0%
Lit-Pass2	Raggiungere il traguardo/l'aeroporto	3.60	0%	0%
Id-Act	Reggere la candela/il tendone	5.40	0%	0%
Id-Pass1	Reggere la candela/il tendone	3.00	0%	0%
Id-Pass2	Reggere la candela/il tendone	2.30	0%	0%
Lit-Act	Reggere la candela/il tendone	6.00	0%	0%
Lit-Pass1	Reggere la candela/il tendone	4.50	0%	0%
Lit-Pass2	Reggere la candela/il tendone	2.70	0%	0%
Id-Act	Rischiare le penne/dei falli	6.70	0%	50%
Id-Pass1	Rischiare le penne/dei falli	1.70	0%	0%
Id-Pass2	Rischiare le penne/dei falli	2.10	0%	0%
Lit-Act	Rischiare le penne/dei falli	6.40	0%	0%
Lit-Pass1	Rischiare le penne/dei falli	2.30	0%	0%
Lit-Pass2	Rischiare le penne/dei falli	4.00	0%	0%
Id-Act	Rivoltare la frittata/la tovaglia	5.90	0%	70%
Id-Pass1	Rivoltare la frittata/la tovaglia	3.30	0%	0%
Id-Pass2	Rivoltare la frittata/la tovaglia	2.70	0%	70%
Lit-Act	Rivoltare la frittata/la tovaglia	6.60	0%	0%
Lit-Pass1	Rivoltare la frittata/la tovaglia	3.80	0%	0%
Lit-Pass2	Rivoltare la frittata/la tovaglia	3.60	0%	0%
Id-Act	Rompere le scatole/gli occhiali	6.90	0%	80%
Id-Pass1	Rompere le scatole/gli occhiali	1.80	0%	20%
Id-Pass2	Rompere le scatole/gli occhiali	2.30	0%	10%
Lit-Act	Rompere le scatole/gli occhiali	6.30	0%	50%
Lit-Pass1	Rompere le scatole/gli occhiali	2.70	0%	10%
Lit-Pass2	Rompere le scatole/gli occhiali	2.90	0%	0%

Id-Act	Saltare il fosso/la corsia	3.70	0%	10%
Id-Pass1	Saltare il fosso/la corsia	1.60	0%	10%
Id-Pass2	Saltare il fosso/la corsia	1.90	0%	0%
Lit-Act	Saltare il fosso/la corsia	6.30	0%	0%
Lit-Pass1	Saltare il fosso/la corsia	3.70	0%	0%
Lit-Pass2	Saltare il fosso/la corsia	2.00	0%	0%
Id-Act	Salvare la faccia/l'affare	6.20	0%	10%
Id-Pass1	Salvare la faccia/l'affare	2.10	0%	30%
Id-Pass2	Salvare la faccia/l'affare	3.40	0%	0%
Lit-Act	Salvare la faccia/l'affare	6.80	0%	10%
Lit-Pass1	Salvare la faccia/l'affare	5.40	0%	0%
Lit-Pass2	Salvare la faccia/l'affare	4.10	0%	10%
Id-Act	Scavare la fossa/un solco	6.40	0%	70%
Id-Pass1	Scavare la fossa/un solco	2.40	0%	70%
Id-Pass2	Scavare la fossa/un solco	1.70	0%	60%
Lit-Act	Scavare la fossa/un solco	6.70	0%	20%
Lit-Pass1	Scavare la fossa/un solco	3.60	0%	20%
Lit-Pass2	Scavare la fossa/un solco	4.50	0%	10%
Id-Act	Scoprire le carte/il volto	5.70	0%	10%
Id-Pass1	Scoprire le carte/il volto	3.70	0%	10%
Id-Pass2	Scoprire le carte/il volto	2.90	0%	0%
Lit-Act	Scoprire le carte/il volto	6.10	0%	0%
Lit-Pass1	Scoprire le carte/il volto	2.40	0%	0%
Lit-Pass2	Scoprire le carte/il volto	3.00	0%	0%
Id-Act	Segare le gambe/le catene	6.10	0%	50%
Id-Pass1	Segare le gambe/le catene	6.40	0%	10%
Id-Pass2	Segare le gambe/le catene	1.80	0%	50%
Lit-Act	Segare le gambe/le catene	6.60	0%	10%

Lit-Pass1	Segare le gambe/le catene	3.20	0%	0%
Lit-Pass2	Segare le gambe/le catene	4.10	0%	0%
Id-Act	Spezzare una lancia/il calice	6.10	0%	80%
Id-Pass1	Spezzare una lancia/il calice	4.30	0%	70%
Id-Pass2	Spezzare una lancia/il calice	3.40	0%	70%
Lit-Act	Spezzare una lancia/il calice	6.10	0%	0%
Lit-Pass1	Spezzare una lancia/il calice	4.10	0%	0%
Lit-Pass2	Spezzare una lancia/il calice	6.40	0%	0%
Id-Act	Sputare i polmoni/un insetto	4.80	0%	0%
Id-Pass1	Sputare i polmoni/un insetto	1.80	0%	0%
Id-Pass2	Sputare i polmoni/un insetto	2.20	0%	0%
Lit-Act	Sputare i polmoni/un insetto	6.60	0%	10%
Lit-Pass1	Sputare i polmoni/un insetto	3.40	10%	0%
Lit-Pass2	Sputare i polmoni/un insetto	2.60	0%	0%
Id-Act	Staccare la spina/la sella	6.80	0%	70%
Id-Pass1	Staccare la spina/la sella	1.80	0%	10%
Id-Pass2	Staccare la spina/la sella	2.30	0%	40%
Lit-Act	Staccare la spina/la sella	6.70	0%	0%
Lit-Pass1	Staccare la spina/la sella	3.00	0%	0%
Lit-Pass2	Staccare la spina/la sella	2.00	0%	0%
Id-Act	Stringere i denti/le ruote	6.80	0%	60%
Id-Pass1	Stringere i denti/le ruote	2.90	0%	0%
Id-Pass2	Stringere i denti/le ruote	2.40	0%	0%
Lit-Act	Stringere i denti/le ruote	6.80	0%	0%
Lit-Pass1	Stringere i denti/le ruote	2.60	0%	0%
Lit-Pass2	Stringere i denti/le ruote	2.40	0%	0%
Id-Act	Subire uno scacco/uno scippo	5.90	0%	0%
Id-Pass1	Subire uno scacco/uno scippo	2.80	0%	0%

Id-Pass2	Subire uno scacco/uno scippo	2.40	0%	0%
Lit-Act	Subire uno scacco/uno scippo	4.20	0%	30%
Lit-Pass1	Subire uno scacco/uno scippo	2.30	0%	0%
Lit-Pass2	Subire uno scacco/uno scippo	5.20	0%	0%
Id-Act	Tagliare la corda/la barba	6.20	0%	70%
Id-Pass1	Tagliare la corda/la barba	2.10	0%	50%
Id-Pass2	Tagliare la corda/la barba	2.20	0%	20%
Lit-Act	Tagliare la corda/la barba	6.80	0%	30%
Lit-Pass1	Tagliare la corda/la barba	3.00	0%	30%
Lit-Pass2	Tagliare la corda/la barba	2.40	0%	0%
Id-Act	Tentare la sorte/un furto	6.70	0%	30%
Id-Pass1	Tentare la sorte/un furto	3.20	0%	0%
Id-Pass2	Tentare la sorte/un furto	2.40	0%	50%
Lit-Act	Tentare la sorte/un furto	6.20	0%	0%
Lit-Pass1	Tentare la sorte/un furto	5.00	0%	10%
Lit-Pass2	Tentare la sorte/un furto	4.10	0%	0%
Id-Act	Tirare la corda/il freno	5.40	0%	70%
Id-Pass1	Tirare la corda/il freno	2.80	0%	50%
Id-Pass2	Tirare la corda/il freno	2.90	0%	20%
Lit-Act	Tirare la corda/il freno	6.60	0%	30%
Lit-Pass1	Tirare la corda/il freno	4.10	0%	60%
Lit-Pass2	Tirare la corda/il freno	3.50	0%	30%
Id-Act	Trovare la chiave/del denaro	5.90	0%	0%
Id-Pass1	Trovare la chiave/del denaro	4.30	0%	20%
Id-Pass2	Trovare la chiave/del denaro	4.10	20%	10%
Lit-Act	Trovare la chiave/del denaro	6.30	10%	0%
Lit-Pass1	Trovare la chiave/del denaro	3.50	0%	0%
Lit-Pass2	Trovare la chiave/del denaro	3.50	0%	20%

Id-Act	Urtare i nervi/il polso	5.40	0%	10%
Id-Pass1	Urtare i nervi/il polso	1.90	0%	0%
Id-Pass2	Urtare i nervi/il polso	1.70	0%	0%
Lit-Act	Urtare i nervi/il polso	6.80	0%	0%
Lit-Pass1	Urtare i nervi/il polso	2.90	0%	0%
Lit-Pass2	Urtare i nervi/il polso	1.50	0%	0%
Id-Act	Vedere le stelle/la rapina	6.10	0%	30%
Id-Pass1	Vedere le stelle/la rapina	2.40	0%	0%
Id-Pass2	Vedere le stelle/la rapina	2.10	0%	20%
Lit-Act	Vedere le stelle/la rapina	4.80	0%	0%
Lit-Pass1	Vedere le stelle/la rapina	4.70	0%	0%
Lit-Pass2	Vedere le stelle/la rapina	2.30	0%	0%
Id-Act	Vuotare il sacco/il pozzo	6.70	0%	90%
Id-Pass1	Vuotare il sacco/il pozzo	2.00	0%	0%
Id-Pass2	Vuotare il sacco/il pozzo	3.10	0%	40%
Lit-Act	Vuotare il sacco/il pozzo	6.20	0%	0%
Lit-Pass1	Vuotare il sacco/il pozzo	4.70	0%	0%
Lit-Pass2	Vuotare il sacco/il pozzo	3.60	0%	0%

Table B.3: Average naturalness ratings, cloze probability ratings when the sentence was being cut off right before the first content word of the idiom/literal phrase (w1), cloze probability ratings when the sentence was being cut off right before the second content word of the idiom/literal phrase (w2) for the six experimental conditions of the 60 Italian verb-determiner-noun idioms used as items in the first eye-tracking in Chapter 3.

B.4 Experimental sentences of experiment 1

Cond.	Item	Sentence
Id-Act	Abbassare la cresta/lo stereo	A quando dicono, Maria ha abbassato la cresta dopo che la sua relatrice l'ha aspramente ripresa per la sua imprecisione. 'From what I heard, Maria got off her high horse after her advisor harshly scolded her because of her inaccuracy'.
Id-P1	Abbassare la cresta/lo stereo	A quando dicono, la cresta è stata abbassata da Maria dopo che la sua relatrice l'ha aspramente ripresa per la sua imprecisione. 'From what I heard, the crest was lowered by Maria after her advisor harshly scolded her because of her inaccuracy'.
Id-P2	Abbassare la cresta/lo stereo	A quando dicono, è stata abbassata la cresta da Maria dopo che la sua relatrice l'ha aspramente ripresa per la sua imprecisione. 'From what I heard, lit. was lowered the crest by Maria after her advisor harshly scolded her because of her inaccuracy'.
Lit-Act	Abbassare la cresta/lo stereo	A quanto sento, Maria ha abbassato lo stereo perché la sorella, intenta a studiare, si è lamentata del volume troppo alto. 'As far as I can hear, Maria turned down the stereo because her sister, who is studying, complained about the high volume'.
Lit-P1	Abbassare la cresta/lo stereo	A quanto sento, lo stereo è stato abbassato da Maria perché la sorella, intenta a studiare, si è lamentata del volume troppo alto. 'As far as I can hear, the stereo was turned down by Maria because her sister, who is studying, complained about the high volume'.
Lit-P2	Abbassare la cresta/lo stereo	A quanto sento, è stato abbassato lo stereo da Maria perché la sorella, intenta a studiare, si è lamentata del volume troppo alto. 'As far as I can hear, lit. was turned down the stereo by Maria because her sister, who is studying, complained about the high volume'.
Id-Act	Accusare il colpo/la banca	Come era prevedibile, Daniele ha accusato il colpo quando la moglie l'ha lasciato all'improvviso dopo anni di matrimonio. 'Predictably, Daniele suffered the blow when his wife left him out of the blue after years of marriage'.
Id-P1	Accusare il colpo/la banca	Come era prevedibile, il colpo è stato accusato da Daniele quando la moglie l'ha lasciato all'improvviso dopo anni di matrimonio. 'Predictably, the blow was suffered by Daniele when his wife left him out of the blue after years of marriage'.
Id-P2	Accusare il colpo/la banca	Come era prevedibile, è stato accusato il colpo da Daniele quando la moglie l'ha lasciato all'improvviso dopo anni di matrimonio. 'Predictably, lit. was suffered the blow by Daniele when his wife left him out of the blue after years of marriage'.
Lit-Act	Accusare il colpo/la banca	A quanto pare, Daniele ha accusato la banca di avergli sottratto del denaro nell'ultimo investimento che gli ha proposto. 'Apparently, Daniele accused the bank of taking some of his money away in the last investment they proposed him'.
Lit-P1	Accusare il colpo/la banca	A quanto pare, la banca è stata accusata da Daniele di avergli sottratto del denaro nell'ultimo investimento che gli ha proposto. 'Apparently, the bank was accused by Daniele of taking some of his money away in the last investment they proposed him'.
Lit-P2	Accusare il colpo/la banca	A quanto pare, è stata accusata la banca da Daniele di avergli sottratto del denaro nell'ultimo investimento che gli ha proposto. 'Apparently, lit. was accused the bank by Daniele of taking some of his money away in the last investment they proposed him'.
Id-Act	Allungare il muso/la gita	Come accade sempre, Giulia ha allungato il muso quando la mamma le ha detto che doveva spegnere la TV e fare i compiti. 'As always, Giulia pulled a long face when her mother told her she had to turn off the TV and do her homework'.
Id-P1	Allungare il muso/la gita	Come accade sempre, il muso è stato allungato da Giulia quando la mamma le ha detto che doveva spegnere la TV e fare i compiti. 'As always, the snout was stretched by Giulia when her mother told her she had to turn off the TV and do her homework'.
Id-P2	Allungare il muso/la gita	Come accade sempre, è stato allungato il muso da Giulia quando la mamma le ha detto che doveva spegnere la TV e fare i compiti. 'As always, lit. was stretched the snout by Giulia when her mother told her she had to turn off the TV and do her homework'.
Lit-Act	Allungare il muso/la gita	A grande richiesta, Giulia ha allungato la gita con l'aggiunta di una breve sosta sulla spiaggia per tutti i suoi alunni. 'By popular demand, Giulia extended the trip with a quick stop on the beach for all her pupils'.
Lit-P1	Allungare il muso/la gita	A grande richiesta, la gita è stata allungata da Giulia con l'aggiunta di una breve sosta sulla spiaggia per tutti i suoi alunni. 'By popular demand, the trip was extended by Giulia with a quick stop on the beach for all her pupils'.
Lit-P2	Allungare il muso/la gita	A grande richiesta, è stata allungata la gita da Giulia con l'aggiunta di una breve sosta sulla spiaggia per tutti i suoi alunni. 'By popular demand, lit. was extended the trip by Giulia with a quick stop on the beach for all her pupils'.
Id-Act	Alzare la voce/il libro	Come era prevedibile, Pietro ha alzato la voce coi suoi figli quando ha visto che avevano messo a soqquadro l'intera casa. 'Predictably, Pietro raised his voice with his children when he saw they had messed up the whole house'.

Id-P1	Alzare la voce/il libro	Come era prevedibile, la voce è stata alzata da Pietro coi suoi figli quando ha visto che avevano messo a soqquadro l'intera casa. 'Predictably, the voice was raised by Pietro with his children when he saw they had messed up the whole house'.
Id-P2	Alzare la voce/il libro	Come era prevedibile, è stata alzata la voce da Pietro coi suoi figli quando ha visto che avevano messo a soqquadro l'intera casa. 'Predictably, lit. was raised the voice by Pietro with his children when he saw they had messed up the whole house'.
Lit-Act	Alzare la voce/il libro	Dietro mio consiglio, Pietro ha alzato il libro con un leggio in modo che la schiena gli restasse dritta mentre studiava. 'Following my advice, Pietro lifted his book with a bookrest so that he would not bend his back while studying'.
Lit-P1	Alzare la voce/il libro	Dietro mio consiglio, il libro è stato alzato da Pietro con un leggio in modo che la schiena gli restasse dritta mentre studiava. 'Following my advice, the book was lifted by Pietro with a bookrest so that he would not bend his back while studying'.
Lit-P2	Alzare la voce/il libro	Dietro mio consiglio, è stato alzato il libro da Pietro con un leggio in modo che la schiena gli restasse dritta mentre studiava. 'Following my advice, lit. was lifted the book by Pietro with a bookrest so that he would not bend his back while studying'.
Id-Act	Aprire gli occhi/uno studio	A quanto sembra, Sara ha aperto gli occhi sui problemi del figlio quando l'hanno avvisata che probabilmente lo bocceranno. 'Apparently, Sara opened her eyes on her son's issues when they warned her he will probably fail the year'.
Id-P1	Aprire gli occhi/uno studio	A quanto sembra, gli occhi sono stati aperti da Sara sui problemi del figlio quando l'hanno avvisata che probabilmente lo bocceranno. 'Apparently, the eyes were opened by Sara on her son's issues when they warned her he will probably fail the year'.
Id-P2	Aprire gli occhi/uno studio	A quanto sembra, sono stati aperti gli occhi da Sara sui problemi del figlio quando l'hanno avvisata che probabilmente lo bocceranno. 'Apparently, lit. were opened the eyes by Sara on her son's issues when they warned her he will probably fail the year'.
Lit-Act	Aprire gli occhi/uno studio	Con grande soddisfazione, Sara ha aperto uno studio dopo che ha faticosamente ottenuto la specializzazione in psichiatria. 'With great satisfaction, Sara opened an office after specializing in psychiatry with a great effort'.
Lit-P1	Aprire gli occhi/uno studio	Con grande soddisfazione, uno studio è stato aperto da Sara dopo che ha faticosamente ottenuto la specializzazione in psichiatria. 'With great satisfaction, an office was opened by Sara after she specialized in psychiatry with a great effort'.
Lit-P2	Aprire gli occhi/uno studio	Con grande soddisfazione, è stato aperto uno studio da Sara dopo che ha faticosamente ottenuto la specializzazione in psichiatria. 'With great satisfaction, lit. was opened an office by Sara after she specialized in psychiatry with a great effort'.
Id-Act	Attaccare un bottone/la lampada	Come ogni mattina, Giovanni ha attaccato un bottone alla vicina di casa quando l'ha trovata al mercato a fare la spesa. 'Like every morning, Giovanni buttonholed his neighbor when he met her while she was grocery shopping'.
Id-P1	Attaccare un bottone/la lampada	Come ogni mattina, un bottone è stato attaccato da Giovanni alla vicina di casa quando l'ha trovata al mercato a fare la spesa. 'Like every morning, a button was attached by Giovanni to his neighbor when he met her while she was grocery shopping'.
Id-P2	Attaccare un bottone/la lampada	Come ogni mattina, è stato attaccato un bottone da Giovanni alla vicina di casa quando l'ha trovata al mercato a fare la spesa. 'Like every morning, lit. was attached a button by Giovanni to his neighbor when he met her while she was grocery shopping'.
Lit-Act	Attaccare un bottone/la lampada	Essendo ormai sera, Giovanni ha attaccato la lampada alla corrente così che potesse studiare senza affaticare la vista. 'Since it was evening, Giovanni plugged the lamp in so he could study without putting his sight under strain'.
Lit-P1	Attaccare un bottone/la lampada	Essendo ormai sera, la lampada è stata attaccata da Giovanni alla corrente così che potesse studiare senza affaticare la vista. 'Since it was evening, the lamp was plugged in by Giovanni so he could study without putting his sight under strain'.
Lit-P2	Attaccare un bottone/la lampada	Essendo ormai sera, è stata attaccata la lampada da Giovanni alla corrente così che potesse studiare senza affaticare la vista. 'Since it was evening, lit. was plugged in the lamp by Giovanni so he could study without putting his sight under strain'.
Id-Act	Avvelenare il fegato/il rivale	A lungo andare, Luigi ha avvelenato il fegato al figlio con quei continui commenti spiacevoli fatti sulla sua fidanzata. 'In the long run, Luigi made his son angry with all those unpleasant remarks on his girlfriend'.
Id-P1	Avvelenare il fegato/il rivale	A lungo andare, il fegato è stato avvelenato da Luigi al figlio con quei continui commenti spiacevoli fatti sulla sua fidanzata. 'In the long run, the liver was poisoned by Luigi to his son with all those unpleasant remarks on his girlfriend'.

Id-P2	Avvelenare il fegato/il rivale	A lungo andare, è stato avvelenato il fegato da Luigi al figlio con quei continui commenti spiacevoli fatti sulla sua fidanzata. 'In the long run, lit. was poisoned the liver by Luigi to his son with all those unpleasant remarks on his girlfriend'.
Lit-Act	Avvelenare il fegato/il rivale	Stando alla deposizione, Luigi ha avvelenato il rivale prima del match perché sperava così di metterlo subito fuori gioco. 'According to the testimony, Luigi poisoned his rival before the match because in this way he was hoping to knock him out right away'.
Lit-P1	Avvelenare il fegato/il rivale	Stando alla deposizione, il rivale è stato avvelenato da Luigi prima del match perché sperava così di metterlo subito fuori gioco. 'According to the testimony, the rival was poisoned by Luigi before the match because in this way he was hoping to knock him out right away'.
Lit-P2	Avvelenare il fegato/il rivale	Stando alla deposizione, è stato avvelenato il rivale da Luigi prima del match perché sperava così di metterlo subito fuori gioco. 'According to the testimony, was poisoned the rival by Luigi before the match because in this way he was hoping to knock him out right away'.
Id-Act	Battere la fiacca/lo stinco	Come al solito, Irene ha battuto la fiacca tutto il pomeriggio senza che la consegna affidatale venisse portata a termine. 'As usual, Irene slacked off the whole afternoon without carrying out the job they had assigned her'.
Id-P1	Battere la fiacca/lo stinco	Come al solito, la fiacca è stata battuta da Irene tutto il pomeriggio senza che la consegna affidatale venisse portata a termine. 'As usual, the weariness was beaten by Irene the whole afternoon without carrying out the job they had assigned her'.
Id-P2	Battere la fiacca/lo stinco	Come al solito, è stata battuta la fiacca da Irene tutto il pomeriggio senza che la consegna affidatale venisse portata a termine. 'As usual, lit. was beaten the weariness by Irene the whole afternoon without carrying out the job they had assigned her'.
Lit-Act	Battere la fiacca/lo stinco	A quanto sapevo, Irene ha battuto lo stinco quando, salendo sul treno di corsa, è inciampata sui gradini della carrozza. 'As far as I knew, Irene hit her shin when, getting on the train in a rush, she stumbled on the car steps'.
Lit-P1	Battere la fiacca/lo stinco	A quanto sapevo, lo stinco è stato battuto da Irene quando, salendo sul treno di corsa, è inciampata sui gradini della carrozza. 'As far as I knew, the shin was hit by Irene when, getting on the train in a rush, she stumbled on the car steps'.
Lit-P2	Battere la fiacca/lo stinco	A quanto sapevo, è stato battuto lo stinco da Irene quando, salendo sul treno di corsa, è inciampata sui gradini della carrozza. 'As far as I knew, lit. was hit the shin by Irene when, getting on the train in a rush, she stumbled on the car steps'.
Id-Act	Brucciare le tappe/la carne	Senza alcun dubbio, Valentina ha bruciato le tappe quando è riuscita a laurearsi nella metà del tempo stupendoci tutti. 'Without any doubt, Valentina rushed into things when she graduated in half of the time leaving all of us baffled'.
Id-P1	Brucciare le tappe/la carne	Senza alcun dubbio, le tappe sono state bruciate da Valentina quando è riuscita a laurearsi nella metà del tempo stupendoci tutti. 'Without any doubt, the stops were burned down by Valentina when she graduated in half of the time leaving all of us baffled'.
Id-P2	Brucciare le tappe/la carne	Senza alcun dubbio, sono state bruciate le tappe da Valentina quando è riuscita a laurearsi nella metà del tempo stupendoci tutti. 'Without any doubt, lit. were burned down the stops by Valentina when she graduated in half of the time leaving all of us baffled'.
Lit-Act	Brucciare le tappe/la carne	Come spesso succede, Valentina ha bruciato la carne perché l'ha lasciata troppo tempo a scaldare in padella senza girarla. 'As usual, Valentina burned the meat because she left it being heated up in the pan for too long without flipping it'.
Lit-P1	Brucciare le tappe/la carne	Come spesso succede, la carne è stata bruciata da Valentina perché l'ha lasciata troppo tempo a scaldare in padella senza girarla. 'As usual, the meat was burned by Valentina because she left it being heated up in the pan for too long without flipping it'.
Lit-P2	Brucciare le tappe/la carne	Come spesso succede, è stata bruciata la carne da Valentina perché l'ha lasciata troppo tempo a scaldare in padella senza girarla. 'As usual, lit. was burned the meat by Valentina because she left it being heated up in the pan for too long without flipping it'.
Id-Act	Chiudere il becco/l'uscio	Con sollievo generale, Fabio ha chiuso il becco dopo un'ora passata a disturbare l'assemblea con interventi fuori luogo. 'With collective relief, Fabio shut his mouth after an hour spent bothering the meeting with his inappropriate comments'.
Id-P1	Chiudere il becco/l'uscio	Con sollievo generale, il becco è stato chiuso da Fabio dopo un'ora passata a disturbare l'assemblea con interventi fuori luogo. 'With collective relief, the beak was shut by Fabio after an hour spent bothering the meeting with his inappropriate comments'.
Id-P2	Chiudere il becco/l'uscio	Con sollievo generale, è stato chiuso il becco da Fabio dopo un'ora passata a disturbare l'assemblea con interventi fuori luogo. 'With collective relief, lit. was shut the beak by Fabio after an hour spent bothering the meeting with his inappropriate comments'.

Lit-Act	Chiudere il becco/l'uscio	A quanto vedo, Fabio ha chiuso l'uscio perché doveva concentrarsi e i rumori che provenivano dalla strada lo distraevano. 'As far as I see, Fabio closed the outside door because he had to focus and the noises coming from the street were distracting him'.
Lit-P1	Chiudere il becco/l'uscio	A quanto vedo, l'uscio è stato chiuso da Fabio perché doveva concentrarsi e i rumori che provenivano dalla strada lo distraevano. 'As far as I see, the outside door was closed by Fabio because he had to focus and the noises coming from the street were distracting him'.
Lit-P2	Chiudere il becco/l'uscio	A quanto vedo, è stato chiuso l'uscio da Fabio perché doveva concentrarsi e i rumori che provenivano dalla strada lo distraevano. 'As far as I see, lit. was closed the outside door by Fabio because he had to focus and the noises coming from the street were distracting him'.
Id-Act	Contare le pecore/gli alunni	Come mi aspettavo, Anna ha contato le pecore fino alle cinque di mattina dopo tutto quel caffè bevuto durante la giornata. 'As I was expecting, Anna counted sheeps until 5 AM after drinking all that coffee during the day'.
Id-P1	Contare le pecore/gli alunni	Come mi aspettavo, le pecore sono state contate da Anna fino alle cinque di mattina dopo tutto quel caffè bevuto durante la giornata. 'As I was expecting, the sheeps were counted by Anna until 5 AM after drinking all that coffee during the day'.
Id-P2	Contare le pecore/gli alunni	Come mi aspettavo, sono state contate le pecore da Anna fino alle cinque di mattina dopo tutto quel caffè bevuto durante la giornata. 'As I was expecting, lit. were counted the sheeps by Anna until 5 AM after drinking all that coffee during the day'.
Lit-Act	Contare le pecore/gli alunni	Come da prassi, Anna ha contato gli alunni una volta arrivati all'ingresso del museo per assicurarsi che ci fossero tutti. 'Following the routine, Anna counted the pupils once they got to the museum entrance to make sure they were all there'.
Lit-P1	Contare le pecore/gli alunni	Come da prassi, gli alunni sono stati contati da Anna una volta arrivati all'ingresso del museo per assicurarsi che ci fossero tutti. 'Following the routine, the pupils were counted by Anna once they got to the museum entrance to make sure they were all there'.
Lit-P2	Contare le pecore/gli alunni	Come da prassi, sono stati contati gli alunni da Anna una volta arrivati all'ingresso del museo per assicurarsi che ci fossero tutti. 'Following the routine, lit. were counted the pupils by Anna once they got to the museum entrance to make sure they were all there'.
Id-Act	Coprire le spalle/il tavolo	Senza alcun dubbio, Debora ha coperto le spalle ai suoi compagni quando si è offerta lei per l'interrogazione di greco. 'Without any doubt, Debora got her classmates' back when she volunteered for the Greek oral test'.
Id-P1	Coprire le spalle/il tavolo	Senza alcun dubbio, le spalle sono state coperte da Debora ai suoi compagni quando si è offerta lei per l'interrogazione di greco. 'Without any doubt, the shoulders were covered by Debora to her classmates when she volunteered for the Greek oral test'.
Id-P2	Coprire le spalle/il tavolo	Senza alcun dubbio, sono state coperte le spalle da Debora ai suoi compagni quando si è offerta lei per l'interrogazione di greco. 'Without any doubt, lit. were covered the shoulders by Debora to her classmates when she volunteered for the Greek oral test'.
Lit-Act	Coprire le spalle/il tavolo	A quanto vedo, Debora ha coperto il tavolo con dei giornali così che non si sporcasse durante l'imbiancatura del locale. 'As far as I can see, Debora covered the table with some newspapers so as not to get it stained while the room was being whitewashed'.
Lit-P1	Coprire le spalle/il tavolo	A quanto vedo, il tavolo è stato coperto da Debora con dei giornali così che non si sporcasse durante l'imbiancatura del locale. 'As far as I can see, the table was covered by Debora with some newspapers so as not to get it stained while the room was being whitewashed'.
Lit-P2	Coprire le spalle/il tavolo	A quanto vedo, è stato coperto il tavolo da Debora con dei giornali così che non si sporcasse durante l'imbiancatura del locale. 'As far as I can see, lit. was covered the table by Debora with some newspapers so as not to get it stained while the room was being whitewashed'.
Id-Act	Cucire le labbra/la manica	Senza sentire ragioni, Roberto ha cucito le labbra alla segretaria con il divieto assoluto di rivelare la loro relazione. 'Without listening to any explanation, Roberto sealed the lips to his secretary forbidding her to disclose their affair in any possible way'.

Id-P1	Cucire le labbra/la manica	Senza sentire ragioni, le labbra sono state cucite da Roberto alla segretaria con il divieto assoluto di rivelare la loro relazione. 'Without listening to any explanation, the lips were sealed by Roberto to his secretary forbidding her to disclose their affair in any possible way'.
Id-P2	Cucire le labbra/la manica	Senza sentire ragioni, sono state cucite le labbra da Roberto alla segretaria con il divieto assoluto di rivelare la loro relazione. 'Without listening to any explanation, lit. were sealed the lips by Roberto to his secretary forbidding her to disclose their affair in any possible way'.
Lit-Act	Cucire le labbra/la manica	Con grande abilità, Roberto ha cucito la manica alla sua giacca dopo che si era strappata in una brutta caduta da cavallo. 'Very skillfully, Roberto sewed the sleeve to his jacket after it was ripped off when he fell off a horse'.
Lit-P1	Cucire le labbra/la manica	Con grande abilità, la manica è stata cucita da Roberto alla sua giacca dopo che si era strappata in una brutta caduta da cavallo. 'Very skillfully, the sleeve was sewn by Roberto to his jacket after it was ripped off when he fell off a horse'.
Lit-P2	Cucire le labbra/la manica	Con grande abilità, è stata cucita la manica da Roberto alla sua giacca dopo che si era strappata in una brutta caduta da cavallo. 'Very skillfully, lit. was sewn the sleeve by Roberto to his jacket after it was ripped off when he fell off a horse'.
Id-Act	Dare i numeri/un titolo	Come era prevedibile, Carla ha dato i numeri quando ha visto il disordine che i suoi figli avevano creato nel soggiorno. 'Quite predictably, Carla freaked out when she saw the mess her children had created in the living room'.
Id-P1	Dare i numeri/un titolo	Come era prevedibile, i numeri sono stati dati da Carla quando ha visto il disordine che i suoi figli avevano creato nel soggiorno. 'Quite predictably, the numbers were given by Carla when she saw the mess her children had created in the living room'.
Id-P2	Dare i numeri/un titolo	Come era prevedibile, sono stati dati i numeri da Carla quando ha visto il disordine che i suoi figli avevano creato nel soggiorno. 'Quite predictably, lit. were given the numbers by Carla when she saw the mess her children had created in the living room'.
Lit-Act	Dare i numeri/un titolo	A quanto sapevo, Carla ha dato un titolo al romanzo solo dopo molti mesi passati a scriverlo perché era sempre indecisa. 'As far as I knew, Carla gave a title to her novel only after many months spent composing it'.
Lit-P1	Dare i numeri/un titolo	A quanto sapevo, un titolo è stato dato da Carla al romanzo solo dopo molti mesi passati a scriverlo perché era sempre indecisa. 'As far as I knew, a title was given to the novel by Carla only after many months spent composing it'.
Lit-P2	Dare i numeri/un titolo	A quanto sapevo, è stato dato un titolo da Carla al romanzo solo dopo molti mesi passati a scriverlo perché era sempre indecisa. 'As far as I knew, lit. was given a title to the novel by Carla only after many months spent composing it'.
Id-Act	Fare una croce/una piega	A quanto sapevo, Simone ha fatto una croce su quel ristorante da quando ha avuto un'intossicazione dopo aver cenato lì. 'As far as I knew, Simone forgot about that restaurant after he had a food poisoning after eating there'.
Id-P1	Fare una croce/una piega	A quanto sapevo, una croce è stata fatta da Simone su quel ristorante da quando ha avuto un'intossicazione dopo aver cenato lì. 'As far as I knew, a cross was made by Simone on that restaurant after he had a food poisoning after eating there'.
Id-P2	Fare una croce/una piega	A quanto sapevo, è stata fatta una croce da Simone su quel ristorante da quando ha avuto un'intossicazione dopo aver cenato lì. 'As far as I knew, lit. was made a cross by Simone on that restaurant after he had a food poisoning after eating there'.
Lit-Act	Fare una croce/una piega	Dietro mio consiglio, Simone ha fatto una piega sulla pagina perché potesse ritrovare subito il passo che gli interessava. 'Following my advice, Simone made a fold on the page so that he could immediately recover the passage he was interested in'.
Lit-P1	Fare una croce/una piega	Dietro mio consiglio, una piega è stata fatta da Simone sulla pagina perché potesse ritrovare subito il passo che gli interessava. 'Following my advice, a fold was made on the page by Simone so that he could immediately recover the passage he was interested in'.
Lit-P2	Fare una croce/una piega	Dietro mio consiglio, è stata fatta una piega da Simone sulla pagina perché potesse ritrovare subito il passo che gli interessava. 'Following my advice, lit. was made a fold on the page by Simone so that he could immediately recover the passage he was interested in'.
Id-Act	Ferire il cuore/un piede	Come purtroppo temevo, Elena ha ferito il cuore ad Andrea quando gli ha comunicato che si sarebbe trasferita all'estero. 'As I feared, Elena hurt Andrea's heart when she told him she would move abroad'.
Id-P1	Ferire il cuore/un piede	Come purtroppo temevo, il cuore è stato ferito da Elena ad Andrea quando gli ha comunicato che si sarebbe trasferita all'estero. 'As I feared, the heart was hurt by Elena to Andrea when she told him she would move abroad'.

Id-P2	Ferire il cuore/un piede	Come purtroppo temevo, è stato ferito il cuore da Elena ad Andrea quando gli ha comunicato che si sarebbe trasferita all'estero. 'As I feared, lit. was hurt the heart by Elena to Andrea when she told him she would move abroad'.
Lit-Act	Ferire il cuore/un piede	A quanto dicevano, Elena ha ferito un piede ad Andrea quando glielo ha calpestato per sbaglio mentre giocavano a tennis. 'From what I heard, Elena hurt a foot to Andrea when she stepped on it by mistake while they were playing tennis'.
Lit-P1	Ferire il cuore/un piede	A quanto dicevano, un piede è stato ferito da Elena ad Andrea quando glielo ha calpestato per sbaglio mentre giocavano a tennis. 'From what I heard, a foot was hurt by Elena to Andrea when she stepped on it by mistake while they were playing tennis'.
Lit-P2	Ferire il cuore/un piede	A quanto dicevano, è stato ferito un piede da Elena ad Andrea quando glielo ha calpestato per sbaglio mentre giocavano a tennis. 'From what I heard, lit. was hurt a foot by Elena to Andrea when she stepped on it by mistake while they were playing tennis'.
Id-Act	Ficcare il naso/dei pali	A quanto pare, Paolo ha ficcato il naso ripetutamente nei problemi familiari del collega con continue domande indiscrete. 'Apparently, Paolo repeatedly stuck his nose into his colleague's family issues with repeated meddlesome questions'.
Id-P1	Ficcare il naso/dei pali	A quanto pare, il naso è stato ficcato da Paolo ripetutamente nei problemi familiari del collega con continue domande indiscrete. 'Apparently, the nose was stuck by Paolo repeatedly into his colleague's family issues with repeated meddlesome questions'.
Id-P2	Ficcare il naso/dei pali	A quanto pare, è stato ficcato il naso da Paolo ripetutamente nei problemi familiari del collega con continue domande indiscrete. 'Apparently, lit. was stuck the nose by Paolo repeatedly into his colleague's family issues with repeated meddlesome questions'.
Lit-Act	Ficcare il naso/dei pali	A quanto vedo, Paolo ha ficcato dei pali nel terreno perché vuole montare un gazebo per la festa di compleanno del figlio. 'As far as I can see, Paolo stuck some poles into the ground because he wants to assemble a gazebo for his son's birthday party'.
Lit-P1	Ficcare il naso/dei pali	A quanto vedo, dei pali sono stati ficcati da Paolo nel terreno perché vuole montare un gazebo per la festa di compleanno del figlio. 'As far as I can see, some poles were stuck by Paolo into the ground because he wants to assemble a gazebo for his son's birthday party'.
Lit-P2	Ficcare il naso/dei pali	A quanto vedo, sono stati ficcati dei pali da Paolo nel terreno perché vuole montare un gazebo per la festa di compleanno del figlio. 'As far as I can see, were stuck some poles by Paolo into the ground because he wants to assemble a gazebo for his son's birthday party'.
Id-Act	Frenare la lingua/la strage	Giusto in tempo, Filippo ha frenato la lingua prima che gli sfuggisse un pesante insulto al fratello durante il litigio. 'Just in time, Filippo held his tongue before saying a brutal insult against his brother during the fight'.
Id-P1	Frenare la lingua/la strage	Giusto in tempo, la lingua è stata frenata da Filippo prima che gli sfuggisse un pesante insulto al fratello durante il litigio. 'Just in time, the tongue was held by Filippo before saying a brutal insult against his brother during the fight'.
Id-P2	Frenare la lingua/la strage	Giusto in tempo, è stata frenata la lingua da Filippo prima che gli sfuggisse un pesante insulto al fratello durante il litigio. 'Just in time, lit. was held the tongue by Filippo before saying a brutal insult against his brother during the fight'.
Lit-Act	Frenare la lingua/la strage	Con grande abilità, Filippo ha frenato la strage uccidendo sul colpo i due attentatori prima che facessero altre vittime. 'Very skillfully, Filippo contained the massacre by killing the two attackers on the spot before they killed other victims'.
Lit-P1	Frenare la lingua/la strage	Con grande abilità, la strage è stata frenata da Filippo uccidendo sul colpo i due attentatori prima che facessero altre vittime. 'Very skillfully, the massacre was contained by Filippo by killing the two attackers on the spot before they killed other victims'.
Lit-P2	Frenare la lingua/la strage	Con grande abilità, è stata frenata la strage da Filippo uccidendo sul colpo i due attentatori prima che facessero altre vittime. 'Very skillfully, lit. was contained the massacre by Filippo by killing the two attackers on the spot before they killed other victims'.
Id-Act	Gettare la spugna/il fucile	A quanto vedo, Gianluca ha gettato la spugna dopo continui e inutili tentativi di corteggiare la sua compagna di banco. 'As far as I can see, Gianluca threw in the towel after repeated and useless attempts to pursue his deskmate'.
Id-P1	Gettare la spugna/il fucile	A quanto vedo, la spugna è stata gettata da Gianluca dopo continui e inutili tentativi di corteggiare la sua compagna di banco. 'As far as I can see, the sponge was thrown away by Gianluca after repeated and useless attempts to pursue his deskmate'.
Id-P2	Gettare la spugna/il fucile	A quanto vedo, è stata gettata la spugna da Gianluca dopo continui e inutili tentativi di corteggiare la sua compagna di banco. 'As far as I can see, lit. was thrown away the sponge by Gianluca after repeated and useless attempts to pursue his deskmate'.
Lit-Act	Gettare la spugna/il fucile	Secondo le testimonianze, Gianluca ha gettato il fucile non appena la polizia lo ha circondato e gli ha ordinato di farlo. 'According to the testimonies, Gianluca dropped the gun as soon as the police surrounded him and ordered him to do so'.

Lit-P1	Gettare la spugna/il fucile	Secondo le testimonianze, il fucile è stato gettato da Gianluca non appena la polizia lo ha circondato e gli ha ordinato di farlo. 'According to the testimonies, the gun was dropped by Gianluca as soon as the police surrounded him and ordered him to do so'.
Lit-P2	Gettare la spugna/il fucile	Secondo le testimonianze, è stato gettato il fucile da Gianluca non appena la polizia lo ha circondato e gli ha ordinato di farlo. 'According to the testimonies, lit. was dropped the gun by Gianluca as soon as the police surrounded him and ordered him to do so'.
Id-Act	Imparare la lezione/una poesia	A quanto sembra, Gianfranco ha imparato la lezione dopo che la madre lo ha punito per aver disturbato gli ospiti a cena. 'Apparently, Gianfranco learned the lesson after his mom punished him for bothering the guests during the dinner'.
Id-P1	Imparare la lezione/una poesia	A quanto sembra, la lezione è stata imparata da Gianfranco dopo che la madre lo ha punito per aver disturbato gli ospiti a cena. 'Apparently, the lesson was learnt by Gianfranco after his mom punished him for bothering the guests during the dinner'.
Id-P2	Imparare la lezione/una poesia	A quanto sembra, è stata imparata la lezione da Gianfranco dopo che la madre lo ha punito per aver disturbato gli ospiti a cena. 'Apparently, lit. was learnt the lesson by Gianfranco after his mom punished him for bothering the guests during the dinner'.
Lit-Act	Imparare la lezione/una poesia	In pochi minuti, Gianfranco ha imparato la poesia alla perfezione, di fronte allo stupore della maestra e dei compagni. 'In a few minutes, Gianfranco learned the poem by heart perfectly, leaving his teacher and classmates astonished'.
Lit-P1	Imparare la lezione/una poesia	In pochi minuti, la poesia è stata imparata da Gianfranco alla perfezione, di fronte allo stupore della maestra e dei compagni. 'In a few minutes, the poem was learnt by Gianfranco by heart perfectly, leaving his teacher and classmates astonished'.
Lit-P2	Imparare la lezione/una poesia	In pochi minuti, è stata imparata la poesia da Gianfranco alla perfezione, di fronte allo stupore della maestra e dei compagni. 'In a few minutes, lit. was learnt the poem by Gianfranco by heart perfectly, leaving his teacher and classmates astonished'.
Id-Act	Indorare la pillola/cornice	Con grande abilità, Marcello ha indorato la pillola al figlio quando gli ha detto che studiare è un modo di arricchirsi. 'Very skillfully, Marcello gilded the pill to his son when he told him that studying is a way to enrich oneself'.
Id-P1	Indorare la pillola/cornice	Con grande abilità, la pillola è stata indorata da Marcello al figlio quando gli ha detto che studiare è un modo di arricchirsi. 'Very skillfully, the pill was gilded by Marcello to his son when he told him that studying is a way to enrich oneself'.
Id-P2	Indorare la pillola/cornice	Con grande abilità, è stata indorata la pillola da Marcello al figlio quando gli ha detto che studiare è un modo di arricchirsi. 'Very skillfully, lit. was gilded the pill by Marcello to his son when he told him that studying is a way to enrich oneself'.
Lit-Act	Indorare la pillola/cornice	Con molta pazienza, Marcello ha indorato la cornice al quadro prima che venisse esposto all'asta organizzata l'indomani. 'Very patiently, Marcello gilded the frame to the picture before it was exposed at the auction the day after'.
Lit-P1	Indorare la pillola/cornice	Con molta pazienza, la cornice è stata indorata da Marcello al quadro prima che venisse esposto all'asta organizzata l'indomani. 'Very patiently, the frame was gilded by Marcello to the picture before it was exposed at the auction the day after'.
Lit-P2	Indorare la pillola/cornice	Con molta pazienza, è stata indorata la cornice da Marcello al quadro prima che venisse esposto all'asta organizzata l'indomani. 'Very patiently, lit. was gilded the frame by Marcello to the picture before it was exposed at the auction the day after'.
Id-Act	Ingoiare il rospo/la zuppa	A quanto dicono, Elisa ha ingoiato il rospo con dignità quando il direttore ha assegnato la parte da solista a Francesca. 'From what I heard, Elisa swallowed the bitter pill with dignity when the director gave the solo part to Francesca'.
Id-P1	Ingoiare il rospo/la zuppa	A quanto dicono, il rospo è stato ingoiato da Elisa con dignità quando il direttore ha assegnato la parte da solista a Francesca. 'From what I heard, the toad was swallowed by Elisa with dignity when the director gave the solo part to Francesca'.
Id-P2	Ingoiare il rospo/la zuppa	A quanto dicono, è stato ingoiato il rospo da Elisa con dignità quando il direttore ha assegnato la parte da solista a Francesca. 'From what I heard, lit. was swallowed the toad by Elisa with dignity when the director gave the solo part to Francesca'.
Lit-Act	Ingoiare il rospo/la zuppa	Per quieto vivere, Elisa ha ingoiato la zuppa senza fiatare, sebbene lei pensi che il marito non abbia talento in cucina. 'To avoid a fight, Elisa swallowed the soup without saying a word, although she thinks her husband has no talent in cooking'.
Lit-P1	Ingoiare il rospo/la zuppa	Per quieto vivere, la zuppa è stata ingoiata da Elisa senza fiatare, sebbene lei pensi che il marito non abbia talento in cucina. 'To avoid a fight, the soup was swallowed by Elisa without saying a word, although she thinks her husband has no talent in cooking'.

Lit-P2	Ingoiare il rospo/la zuppa	Per quieto vivere, è stata ingoiata la zuppa da Elisa senza fiatare, sebbene lei pensi che il marito non abbia talento in cucina. 'To avoid a fight, lit. was swallowed the soup by Elisa without saying a word, although she thinks her husband has no talent in cooking'.
Id-Act	Invertire la rotta/la marcia	Dopo molti ripensamenti, Giuseppe ha invertito la rotta con la sua decisione di lasciare gli studi e tornare a lavorare. 'After thinking it over, Giuseppe turned the tide with his decision to quit studying and go back to work'.
Id-P1	Invertire la rotta/la marcia	Dopo molti ripensamenti, la rotta è stata invertita da Giuseppe con la sua decisione di lasciare gli studi e tornare a lavorare. 'After thinking it over, the course was reversed by Giuseppe with his decision to quit studying and go back to work'.
Id-P2	Invertire la rotta/la marcia	Dopo molti ripensamenti, è stata invertita la rotta da Giuseppe con la sua decisione di lasciare gli studi e tornare a lavorare. 'After thinking it over, lit. was reversed the course by Giuseppe with his decision to quit studying and go back to work'.
Lit-Act	Invertire la rotta/la marcia	Prima del casello, Giuseppe ha invertito la marcia con un'inversione a U perché ha capito di avere sbagliato direzione. 'Before the toll booth, Giuseppe reversed direction with a U-bend because he realized he had taken the wrong direction'.
Lit-P1	Invertire la rotta/la marcia	Prima del casello, la marcia è stata invertita da Giuseppe con un'inversione a U perché ha capito di avere sbagliato direzione. 'Before the toll booth, the direction was reversed by Giuseppe with a U-bend because he realized he had taken the wrong direction'.
Lit-P2	Invertire la rotta/la marcia	Prima del casello, è stata invertita la marcia da Giuseppe con un'inversione a U perché ha capito di avere sbagliato direzione. 'Before the toll booth, lit. was reversed the direction by Giuseppe with a U-bend because he realized he had taken the wrong direction'.
Id-Act	Lasciare il segno/la spesa	Come tutti prevedevano, Camilla ha lasciato il segno nel pubblico dopo la sua commovente esibizione al pianoforte stasera. 'As everyone was expecting, Camilla left the mark in the audience after his moving piano exhibition tonight'.
Id-P1	Lasciare il segno/la spesa	Come tutti prevedevano, il segno è stato lasciato da Camilla nel pubblico dopo la sua commovente esibizione al pianoforte stasera. 'As everyone was expecting, the mark was left by Camilla in the audience after his moving piano exhibition tonight'.
Id-P2	Lasciare il segno/la spesa	Come tutti prevedevano, è stato lasciato il segno da Camilla nel pubblico dopo la sua commovente esibizione al pianoforte stasera. 'As everyone was expecting, lit. was left the mark by Camilla in the audience after his moving piano exhibition tonight'.
Lit-Act	Lasciare il segno/la spesa	Come spesso succede, Camilla ha lasciato la spesa nel carrello del supermercato perché andava di fretta ed era distratta. 'As usual, Camilla left the groceries in the shopping cart because she was in a rush and absent-minded'.
Lit-P1	Lasciare il segno/la spesa	Come spesso succede, la spesa è stata lasciata da Camilla nel carrello del supermercato perché andava di fretta ed era distratta. 'As usual, the groceries were left by Camilla in the shopping cart because she was in a rush and absent-minded'.
Lit-P2	Lasciare il segno/la spesa	Come spesso succede, è stata lasciata la spesa da Camilla nel carrello del supermercato perché andava di fretta ed era distratta. 'As usual, were left the groceries by Camilla in the shopping cart because she was in a rush and absent-minded'.
Id-Act	Legare le mani/una rete	A parer mio, Fausto ha legato le mani alla moglie quando le ha impedito di fare parola dei loro problemi con le amiche. 'In my opinion, Fausto tied his wife's hands when he prevented her from bringing up their issues with her friends'.
Id-P1	Legare le mani/una rete	A parer mio, le mani sono state legate da Fausto alla moglie quando le ha impedito di fare parola dei loro problemi con le amiche. 'In my opinion, the hands were tied by Fausto to his wife when he prevented her from bringing up their issues with her friends'.
Id-P2	Legare le mani/una rete	A parer mio, sono state legate le mani da Fausto alla moglie quando le ha impedito di fare parola dei loro problemi con le amiche. 'In my opinion, lit. were tied the hands by Fausto to his wife when he prevented her from bringing up their issues with her friends'.
Lit-Act	Legare le mani/una rete	Come puoi vedere, Fausto ha legato una rete attorno a quell'albero nel suo giardino per evitare che cadesse sulla strada. 'As you can see, Fausto tied a net around that tree in his garden to prevent it from falling on the street'.
Lit-P1	Legare le mani/una rete	Come puoi vedere, una rete è stata legata da Fausto attorno a quell'albero nel suo giardino per evitare che cadesse sulla strada. 'As you can see, a net was tied by Fausto around that tree in his garden to prevent it from falling on the street'.
Lit-P2	Legare le mani/una rete	Come puoi vedere, è stata legata una rete da Fausto attorno a quell'albero nel suo giardino per evitare che cadesse sulla strada. 'As you can see, lit. was tied a net by Fausto around that tree in his garden to prevent it from falling on the street'.
Id-Act	Lustrare le scarpe/i mobili	Secondo tutti noi, Gloria ha lustrato le scarpe al capo per mesi solo perché sperava di ottenere da lui una promozione. 'According to all of us, Gloria flattered her boss for months just because she was hoping to be promoted by him'.

Id-P1	Lustrare le scarpe/i mobili	Secondo tutti noi, le scarpe sono state lustrate da Gloria al capo per mesi solo perché sperava di ottenere da lui una promozione. 'According to all of us, the shoes were shined by Gloria to her boss for months just because she was hoping to be promoted by him'.
Id-P2	Lustrare le scarpe/i mobili	Secondo tutti noi, sono state lustrate le scarpe da Gloria al capo per mesi solo perché sperava di ottenere da lui una promozione. 'According to all of us, lit. were shined the shoes by Gloria to her boss for months just because she was hoping to be promoted by him'.
Lit-Act	Lustrare le scarpe/i mobili	Come ogni anno, Gloria ha lustrato i mobili a tutte le stanze della casa in vista delle visite dei parenti per Natale. 'Like every year, Gloria shined the furniture in every room of her house because she was expecting her relatives to visit at Christmas'.
Lit-P1	Lustrare le scarpe/i mobili	Come ogni anno, i mobili sono stati lustrati da Gloria a tutte le stanze della casa in vista delle visite dei parenti per Natale. 'Like every year, the furniture was shined by Gloria in every room of her house because she was expecting her relatives to visit at Christmas'.
Lit-P2	Lustrare le scarpe/i mobili	Come ogni anno, sono stati lustrati i mobili da Gloria a tutte le stanze della casa in vista delle visite dei parenti per Natale. 'Like every year, lit. was shined the furniture by Gloria in every room of her house because she was expecting her relatives to visit at Christmas'.
Id-Act	Mancare il bersaglio/la votazione	A parer mio, Elisa ha mancato il bersaglio quando ha pubblicato quel romanzo fantasy di scarso successo lo scorso Natale. 'In my opinion, Elisa missed the target when she published that unsuccessful fantasy novel last Christmas'.
Id-P1	Mancare il bersaglio/la votazione	A parer mio, il bersaglio è stato mancato da Elisa quando ha pubblicato quel romanzo fantasy di scarso successo lo scorso Natale. 'In my opinion, the target was missed by Elisa when she published that unsuccessful fantasy novel last Christmas'.
Id-P2	Mancare il bersaglio/la votazione	A parer mio, è stato mancato il bersaglio da Elisa quando ha pubblicato quel romanzo fantasy di scarso successo lo scorso Natale. 'In my opinion, lit. was missed the target by Elisa when she published that unsuccessful fantasy novel last Christmas'.
Lit-Act	Mancare il bersaglio/la votazione	Secondo quanto riportano, Elisa ha mancato la votazione perché si è presentata tardi in aula per via di un contrattempo. 'Reportedly, Elisa missed the voting because she showed up late in the room due to an inconvenience'.
Lit-P1	Mancare il bersaglio/la votazione	Secondo quanto riportano, la votazione è stata mancata da Elisa perché si è presentata tardi in aula per via di un contrattempo. 'Reportedly, the voting was missed by Elisa because she showed up late in the room due to an inconvenience'.
Lit-P2	Mancare il bersaglio/la votazione	Secondo quanto riportano, è stata mancata la votazione da Elisa perché si è presentata tardi in aula per via di un contrattempo. 'Reportedly, lit. was missed the voting by Elisa because she showed up late in the room due to an inconvenience'.
Id-Act	Mangiare la foglia/un panino	Come sospettavamo tutti, Antonio ha mangiato la foglia quando gli abbiamo detto di tenersi libero per il suo compleanno. 'As we all suspected, Antonio smelled a rat when we told him not to make plans for his birthday'.
Id-P1	Mangiare la foglia/un panino	Come sospettavamo tutti, la foglia è stata mangiata da Antonio quando gli abbiamo detto di tenersi libero per il suo compleanno. 'As we all suspected, the leaf was eaten by Antonio when we told him not to make plans for his birthday'.
Id-P2	Mangiare la foglia/un panino	Come sospettavamo tutti, è stata mangiata la foglia da Antonio quando gli abbiamo detto di tenersi libero per il suo compleanno. 'As we all suspected, lit. was eaten the leaf by Antonio when we told him not to make plans for his birthday'.
Lit-Act	Mangiare la foglia/un panino	Oggi a pranzo, Antonio ha mangiato un panino al volo perché voleva sbrigare quanto prima le consegne che aveva accumulato. 'Today for lunch Antonio ate a sandwich on the fly because he wanted to get through some errands he had accumulated'.
Lit-P1	Mangiare la foglia/un panino	Oggi a pranzo, un panino è stato mangiato da Antonio al volo perché voleva sbrigare quanto prima le consegne che aveva accumulato. 'Today for lunch a sandwich was eaten by Antonio on the fly because he wanted to get through some errands he had accumulated'.
Lit-P2	Mangiare la foglia/un panino	Oggi a pranzo, è stato mangiato un panino da Antonio al volo perché voleva sbrigare quanto prima le consegne che aveva accumulato. 'Today for lunch lit. was eaten a sandwich by Antonio on the fly because he wanted to get through some errands he had accumulated'.
Id-Act	Mettere le corna/le pizze	A quanto dicevano, Cristina ha messo le corna al suo ragazzo la sera della festa di Capodanno perché era molto ubriaca. 'From what I heard, Cristina cheated on her boyfriend on New Year's because she was very drunk'.
Id-P1	Mettere le corna/le pizze	A quanto dicevano, la corna sono state messe da Cristina al suo ragazzo la sera della festa di Capodanno perché era molto ubriaca. 'From what I heard, the horns were put by Cristina on her boyfriend because she was very drunk'.

Id-P2	Mettere le corna/le pizze	A quanto dicevano, sono state messe le corna da Cristina al suo ragazzo la sera della festa di Capodanno perché era molto ubriaca. 'From what I heard, lit. were put the horns by Cristina on her boyfriend because she was very drunk'.
Lit-Act	Mettere le corna/le pizze	Giusto poco fa, Cristina ha messo le pizze nel forno in modo che siano pronte non appena i suoi figli arriveranno a casa. 'Right a little while ago, Cristina put the pizzas into the oven so they are ready when her children get home'.
Lit-P1	Mettere le corna/le pizze	Giusto poco fa, le pizze sono state messe da Cristina nel forno in modo che siano pronte non appena i suoi figli arriveranno a casa. 'Right a little while ago, the pizzas were put by Cristina into the oven so they are ready when her children get home'.
Lit-P2	Mettere le corna/le pizze	Giusto poco fa, sono state messe le pizze da Cristina nel forno in modo che siano pronte non appena i suoi figli arriveranno a casa. 'Right a little while ago, lit. were put the pizzas by Cristina into the oven so they are ready when her children get home'.
Id-Act	Montare la testa/la scena	A nostro parere, Selena ha montato la testa all'allievo quando gli ha assicurato che avrebbe potuto pubblicare la tesi. 'In our opinion, Selena gave her pupil a big head when she assured him he would be able to publish his thesis'.
Id-P1	Montare la testa/la scena	A nostro parere, la testa è stata montata da Selena all'allievo quando gli ha assicurato che avrebbe potuto pubblicare la tesi. 'In our opinion, the head was mounted by Selena to her pupil when she assured him he would be able to publish his thesis'.
Id-P2	Montare la testa/la scena	A nostro parere, è stata montata la testa da Selena all'allievo quando gli ha assicurato che avrebbe potuto pubblicare la tesi. 'In our opinion, lit. was mounted the head by Selena to her pupil when she assured him he would be able to publish his thesis'.
Lit-Act	Montare la testa/la scena	Con molta pazienza, Selena ha montato la scena per lo spettacolo di stasera con l'aiuto degli altri colleghi scenografi. 'Very patiently, Selena assembled the scenery for the play tonight with the help of the other set designers'.
Lit-P1	Montare la testa/la scena	Con molta pazienza, la scena è stata montata da Selena per lo spettacolo di stasera con l'aiuto degli altri colleghi scenografi. 'Very patiently, the scenery was assembled by Selena for the play tonight with the help of the other set designers'.
Lit-P2	Montare la testa/la scena	Con molta pazienza, è stata montata la scena da Selena per lo spettacolo di stasera con l'aiuto degli altri colleghi scenografi. 'Very patiently, lit. was assembled the scenery by Selena for the play tonight with the help of the other set designers'.
Id-Act	Mozzare il fiato/il collo	Senza alcun dubbio, Andrea ha mozzato il fiato al pubblico del teatro con quell'incredibile performance di danza classica. 'Without any doubt, Andrea took the audience's breath away at the theatre with that incredible ballet performance'.
Id-P1	Mozzare il fiato/il collo	Senza alcun dubbio, il fiato è stato mozzato da Andrea al pubblico del teatro con quell'incredibile performance di danza classica. 'Without any doubt, the breath was cut off by Andrea to the theatre audience with that incredible ballet performance'.
Id-P2	Mozzare il fiato/il collo	Senza alcun dubbio, è stato mozzato il fiato da Andrea al pubblico del teatro con quell'incredibile performance di danza classica. 'Without any doubt, lit. was cut off the breath by Andrea to the theatre audience with that incredible ballet performance'.
Lit-Act	Mozzare il fiato/il collo	Senza alcuna paura, Andrea ha mozzato il collo alla vipera che, sbucata da sotto un sasso, stava per mordere suo figlio. 'Without any fear, Andrea cut off the neck to the viper that, sneaked out from under a rock, was about to bite his son'.
Lit-P1	Mozzare il fiato/il collo	Senza alcuna paura, il collo è stato mozzato da Andrea alla vipera che, sbucata da sotto un sasso, stava per mordere suo figlio. 'Without any fear, the neck was cut off by Andrea to the viper that, sneaked out from under a rock, was about to bite his son'.
Lit-P2	Mozzare il fiato/il collo	Senza alcuna paura, è stato mozzato il collo da Andrea alla vipera che, sbucata da sotto un sasso, stava per mordere suo figlio. 'Without any fear, lit. was cut off the neck by Andrea to the viper that, sneaked out from under a rock, was about to bite his son'.
Id-Act	Passare il testimone/il biglietto	Come era giusto, Mara ha passato il testimone a un membro più giovane del partito dopo che l'aveva guidato lei per anni. 'Rightfully, Mara passed the baton to a younger member of the party after leading it for nine years'.
Id-P1	Passare il testimone/il biglietto	Come era giusto, il testimone è stato passato da Mara a un membro più giovane del partito dopo che l'aveva guidato lei per anni. 'Rightfully, the baton was passed by Mara to a younger member of the party after leading it for nine years'.
Id-P2	Passare il testimone/il biglietto	Come era giusto, è stato passato il testimone da Mara a un membro più giovane del partito dopo che l'aveva guidato lei per anni. 'Rightfully, lit. was passed the baton by Mara to a younger member of the party after leading it for nine years'.
Lit-Act	Passare il testimone/il biglietto	Per risparmiare tempo, Daniela ha passato il biglietto all'amica perché lo obliterasse al posto suo una volta sul tram. 'To save some time, Daniela passed a ticket to her friend to validate it on her behalf once they would get on the tram'.

Lit-P1	Passare il testimone/il biglietto	Per risparmiare tempo, il biglietto è stato passato da Daniela all'amica perché lo obliterasse al posto suo una volta sul tram. 'To save some time, the ticket was passed by Daniela to her friend to validate it on her behalf once they would get on the tram'.
Lit-P2	Passare il testimone/il biglietto	Per risparmiare tempo, è stato passato il biglietto da Daniela all'amica perché lo obliterasse al posto suo una volta sul tram. 'To save some time, lit. was passed the ticket by Daniela to her friend to validate it on her behalf once they would get on the tram'.
Id-Act	Perdere il filo/una foto	A quanto dicono, Giacomo ha perso il filo più volte mentre stava tenendo la lezione perché era insolitamente distratto. 'From what I heard, Giacomo lost the thread multiple times while he was giving the lecture because he was unusually absent-minded'.
Id-P1	Perdere il filo/una foto	A quanto dicono, il filo è stato perso da Giacomo più volte mentre stava tenendo la lezione perché era insolitamente distratto. 'From what I heard, the thread was lost by Giacomo multiple times while he was giving the lecture because he was unusually absent-minded'.
Id-P2	Perdere il filo/una foto	A quanto dicono, è stato perso il filo da Giacomo più volte mentre stava tenendo la lezione perché era insolitamente distratto. 'From what I heard, lit. was lost the thread by Giacomo multiple times while he was giving the lecture because he was unusually absent-minded'.
Lit-Act	Perdere il filo/una foto	Secondo la deposizione, Giacomo ha perso una foto sul luogo del delitto perché gli era caduta per sbaglio dal portafogli. 'According to the testimony, Giacomo lost a photo on the crime since because it accidentally fell out of his pocket'.
Lit-P1	Perdere il filo/una foto	Secondo la deposizione, una foto è stata persa da Giacomo sul luogo del delitto perché gli era caduta per sbaglio dal portafogli. 'According to the testimony, a photo was lost by Giacomo on the crime since because it accidentally fell out of his pocket'.
Lit-P2	Perdere il filo/una foto	Secondo la deposizione, è stata persa una foto da Giacomo sul luogo del delitto perché gli era caduta per sbaglio dal portafogli. 'According to the testimony, lit. was lost a photo by Giacomo on the crime since because it accidentally fell out of his pocket'.
Id-Act	Piantare le tende/delle palme	Come era prevedibile, Matteo ha piantato le tende a casa della sorella da quando ha scoperto che la moglie lo tradisce. 'Predictably, Matteo settled at his sister's place when he found out his wife was cheating on him'.
Id-P1	Piantare le tende/delle palme	Come era prevedibile, le tende sono state piantate da Matteo a casa della sorella da quando ha scoperto che la moglie lo tradisce. 'Predictably, the tents were pitched by Matteo at his sister's place when he found out his wife was cheating on him'.
Id-P2	Piantare le tende/delle palme	Come era prevedibile, sono state piantate le tende da Matteo a casa della sorella da quando ha scoperto che la moglie lo tradisce. 'Predictably, lit. were pitched the tents by Matteo at his sister's place when he found out his wife was cheating on him'.
Lit-Act	Piantare le tende/delle palme	A quanto vedo, Matteo ha piantato delle palme in quei vasi sul balcone così da coprire la vista dell'interno della casa. 'As far as I can see, Matteo planted some palm trees in those vases on the terrace so as to cover the view of the inside of the house'.
Lit-P1	Piantare le tende/delle palme	A quanto vedo, delle palme sono state piantate da Matteo in quei vasi sul balcone così da coprire la vista dell'interno della casa. 'As far as I can see, some palm trees were planted by Matteo in those vases on the terrace so as to cover the view of the inside of the house'.
Lit-P2	Piantare le tende/delle palme	A quanto vedo, sono state piantate delle palme da Matteo in quei vasi sul balcone così da coprire la vista dell'interno della casa. 'As far as I can see, lit. were planted some palm trees by Matteo in those vases on the terrace so as to cover the view of the inside of the house'.
Id-Act	Portare i pantaloni/il cappello	A quanto dicono, Barbara ha portato i pantaloni nella famiglia per tutto il tempo in cui la madre è rimasta ricoverata. 'From what I heard, Barbara ruled in her family as long as her mother remained hospitalized'.
Id-P1	Portare i pantaloni/il cappello	A quanto dicono, i pantaloni sono stati portati da Barbara nella famiglia per tutto il tempo in cui la madre è rimasta ricoverata. 'From what I heard, the pants were worn by Barbara in her family as long as her mother remained hospitalized'.
Id-P2	Portare i pantaloni/il cappello	A quanto dicono, sono stati portati i pantaloni da Barbara nella famiglia per tutto il tempo in cui la madre è rimasta ricoverata. 'From what I heard, lit. were worn the pants by Barbara in her family as long as her mother remained hospitalized'.

Lit-Act	Portare i pantaloni/il cappello	A parer mio, Barbara ha portato il cappello per tutta la serata perché non vuole far vedere che sta perdendo i capelli. 'In my opinion, Barbara wore the hat the whole night because she does not want people to see that she is losing her hair'.
Lit-P1	Portare i pantaloni/il cappello	A parer mio, il cappello è stato portato da Barbara per tutta la serata perché non vuole far vedere che sta perdendo i capelli. 'In my opinion, the hat was worn by Barbara the whole night because she does not want people to see that she is losing her hair'.
Lit-P2	Portare i pantaloni/il cappello	A parer mio, è stato portato il cappello da Barbara per tutta la serata perché non vuole far vedere che sta perdendo i capelli. 'In my opinion, lit. was worn the hat by Barbara the whole night because she does not want people to see that she is losing her hair'.
Id-Act	Prendere una cotta/una felpa	A quanto so, Silvia ha preso una cotta per Luca nel periodo in cui tutti e due uscivano nella stessa compagnia di amici. 'As far as I know, Silvia got a crush for Luca when they were both going out with the same group of friends'.
Id-P1	Prendere una cotta/una felpa	A quanto so, una cotta è stata presa da Silvia per Luca nel periodo in cui tutti e due uscivano nella stessa compagnia di amici. 'As far as I know, a crush was got by Silvia for Luca when they were both going out with the same group of friends'.
Id-P2	Prendere una cotta/una felpa	A quanto so, è stata presa una cotta da Silvia per Luca nel periodo in cui tutti e due uscivano nella stessa compagnia di amici. 'As far as I know, lit. was got a crush by Silvia for Luca when they were both going out with the same group of friends'.
Lit-Act	Prendere una cotta/una felpa	A quanto so, Silvia ha preso una felpa per il compleanno di Luca perché dice che lui indossa sempre gli stessi vestiti. 'As far as I know, Silvia took a sweater for Luca's birthday because she says he always wears the same clothes'.
Lit-P1	Prendere una cotta/una felpa	A quanto so, una felpa è stata presa da Silvia per il compleanno di Luca perché dice che lui indossa sempre gli stessi vestiti. 'As far as I know, a sweater was taken by Silvia for Luca's birthday because she says he always wears the same clothes'.
Lit-P2	Prendere una cotta/una felpa	A quanto so, è stata presa una felpa da Silvia per il compleanno di Luca perché dice che lui indossa sempre gli stessi vestiti. 'As far as I know, lit. was taken a sweater by Silvia for Luca's birthday because she says he always wears the same clothes'.
Id-Act	Preparare il terreno/il viaggio	Su mio consiglio, Monica ha preparato il terreno per il successivo intervento dell'assessore con una lunga introduzione. 'Following my advice, Monica prepared the ground for the following speech of the council member with a long introduction'.
Id-P1	Preparare il terreno/il viaggio	Su mio consiglio, il terreno è stato preparato da Monica per il successivo intervento dell'assessore con una lunga introduzione. 'Following my advice, the ground was prepared by Monica for the following speech of the council member with a long introduction'.
Id-P2	Preparare il terreno/il viaggio	Su mio consiglio, è stato preparato il terreno da Monica per il successivo intervento dell'assessore con una lunga introduzione. 'Following my advice, lit. was prepared the ground by Monica for the following speech of the council member with a long introduction'.
Lit-Act	Preparare il terreno/il viaggio	Con grande scrupolo, Monica ha preparato il viaggio con le amiche documentandosi a lungo sui posti che avrebbero visitato. 'With great care, Monica prepared the trip with her friends reading up on the places they would visit for a long time'.
Lit-P1	Preparare il terreno/il viaggio	Con grande scrupolo, il viaggio è stato preparato da Monica con le amiche documentandosi a lungo sui posti che avrebbero visitato. 'With great care, the trip was prepared by Monica with her friends reading up on the places they would visit for a long time'.
Lit-P2	Preparare il terreno/il viaggio	Con grande scrupolo, è stato preparato il viaggio da Monica con le amiche documentandosi a lungo sui posti che avrebbero visitato. 'With great care, lit. was prepared the trip by Monica with her friends reading up on the places they would visit for a long time'.
Id-Act	Puntare il dito/la spada	Come era logico, Carlo ha puntato il dito contro i suoi ritmi di lavoro quando Anna gli ha chiesto perché è sempre stanco. 'Of course, Carlo pointed the finger against his work pace when Anna asked him why he was always tired'.
Id-P1	Puntare il dito/la spada	Come era logico, il dito è stato puntato da Carlo contro i suoi ritmi di lavoro quando Anna gli ha chiesto perché è sempre stanco. 'Of course, the finger was pointed by Carlo against his work pace when Anna asked him why he was always tired'.
Id-P2	Puntare il dito/la spada	Come era logico, è stato puntato il dito da Carlo contro i suoi ritmi di lavoro quando Anna gli ha chiesto perché è sempre stanco. 'Of course, lit. was pointed the finger by Carlo against his work pace when Anna asked him why he was always tired'.
Lit-Act	Puntare il dito/la spada	Nella scena finale, Carlo ha puntato la spada contro il petto del rivale sconfitto, che l'ha poi convinto a risparmiarlo. 'In the final scene, Carlo pointed the sword against the chest of the defeated rival, who then convinced him to spare him'.
Lit-P1	Puntare il dito/la spada	Nella scena finale, la spada è stata puntata da Carlo contro il petto del rivale sconfitto, che l'ha poi convinto a risparmiarlo. 'In the final scene, the sword was pointed by Carlo against the chest of the defeated rival, who then convinced him to spare him'.

Lit-P2	Puntare il dito/la spada	Nella scena finale, è stata puntata la spada da Carlo contro il petto del rivale sconfitto, che l'ha poi convinto a risparmiarlo. 'In the final scene, lit. was pointed the sword by Carlo against the chest of the defeated rival, who then convinced him to spare him'.
Id-Act	Raggiungere il traguardo/l'aeroporto	Con grande soddisfazione, Claudio ha raggiunto il traguardo quando si è finalmente laureato in legge dopo anni di studio. 'With great satisfaction, Claudio reached the finish line when he finally graduated in Law after studying many years'
Id-P1	Raggiungere il traguardo/l'aeroporto	Con grande soddisfazione, il traguardo è stato raggiunto da Claudio quando si è finalmente laureato in legge dopo anni di studio. 'With great satisfaction, the finish line was reached by Claudio when he finally graduated in Law after studying many years'.
Id-P2	Raggiungere il traguardo/l'aeroporto	Con grande soddisfazione, è stato raggiunto il traguardo da Claudio quando si è finalmente laureato in legge dopo anni di studio. 'With great satisfaction, lit. was reached the finish line by Claudio when he finally graduated in Law after studying many years'.
Lit-Act	Raggiungere il traguardo/l'aeroporto	Giusto poco fa, Claudio ha raggiunto l'aeroporto assieme alla sua comitiva con un autobus che partiva dal centro città. 'Right a little while ago, Claudio reached the airport with his group on a bus that left from downtown'.
Lit-P1	Raggiungere il traguardo/l'aeroporto	Giusto poco fa, l'aeroporto è stato raggiunto da Claudio assieme alla sua comitiva con un autobus che partiva dal centro città. 'Right a little while ago, the airport was reached by Claudio with his group on a bus that left from downtown'.
Lit-P2	Raggiungere il traguardo/l'aeroporto	Giusto poco fa, è stato raggiunto l'aeroporto da Claudio assieme alla sua comitiva con un autobus che partiva dal centro città. 'Right a little while ago, lit. was reached the airport by Claudio with his group on a bus that left from downtown'.
Id-Act	Reggere la candela/il tendone	A nostro parere, Tommaso ha retto la candela ieri sera durante la cena con Andrea e Marta, che palesemente si piacciono. 'In our opinion, Tommaso was a third wheel last night during the dinner with Andrea and Marta, who are evidently into each other'.
Id-P1	Reggere la candela/il tendone	A nostro parere, la candela è stata retta da Tommaso ieri sera durante la cena con Andrea e Marta, che palesemente si piacciono. 'In our opinion, the candle was held by Tommaso last night during the dinner with Andrea and Marta, who are evidently into each other'.
Id-P2	Reggere la candela/il tendone	A nostro parere, è stata retta la candela da Tommaso ieri sera durante la cena con Andrea e Marta, che palesemente si piacciono. 'In our opinion, lit. was held the candle by Tommaso last night during the dinner with Andrea and Marta, who are evidently into each other'.
Lit-Act	Reggere la candela/il tendone	Stando al racconto, Tommaso ha retto il tendone mentre i commensali correvano fuori dal gazebo che crollava per il vento. 'According to the story, Tommaso held up the marquee while the tablemates were running out of the gazebo that was falling apart due to the wind'.
Lit-P1	Reggere la candela/il tendone	Stando al racconto, il tendone è stato retto da Tommaso mentre i commensali correvano fuori dal gazebo che crollava per il vento. 'According to the story, the marquee was held up by Tommaso while the tablemates were running out of the gazebo that was falling apart due to the wind'.
Lit-P2	Reggere la candela/il tendone	Stando al racconto, è stato retto il tendone da Tommaso mentre i commensali correvano fuori dal gazebo che crollava per il vento. 'According to the story, lit. was held up the marquee by Tommaso while the tablemates were running out of the gazebo that was falling apart due to the wind'.
Id-Act	Rischiare le penne/dei falli	Secondo tutti noi, Corrado ha rischiato le penne quando poco fa si è seduto nello stesso vagone di quei ragazzi ubriachi. 'According to all of us, Corrado risked his own life when a little while ago he sat in the same car with those drunk guys'.
Id-P1	Rischiare le penne/dei falli	Secondo tutti noi, le penne sono state rischiate da Corrado quando poco fa si è seduto nello stesso vagone di quei ragazzi ubriachi. 'According to all of us, the feathers were risked by Corrado when a little while ago he sat in the same car with those drunk guys'.
Id-P2	Rischiare le penne/dei falli	Secondo tutti noi, sono state rischiate le penne da Corrado quando poco fa si è seduto nello stesso vagone di quei ragazzi ubriachi. 'According to all of us, lit. were risked the feathers by Corrado when a little while ago he sat in the same car with those drunk guys'.
Lit-Act	Rischiare le penne/dei falli	A parer mio, Corrado ha rischiato dei falli durante la partita perché marcava troppo da vicino gli avversari con la palla. 'In my opinion, Corrado risked some fouls during the match because he man-marked the opponents with the ball too close'.

Lit-P1	Rischiare le penne/dei falli	A parer mio, dei falli sono stati rischiati da Corrado durante la partita perché marcava troppo da vicino gli avversari con la palla. 'In my opinion, some fouls were risked by Corrado during the match because he man-marked the opponents with the ball too close'.
Lit-P2	Rischiare le penne/dei falli	A parer mio, sono stati rischiati dei falli da Corrado durante la partita perché marcava troppo da vicino gli avversari con la palla. 'In my opinion, lit. were risked some fouls by Corrado during the match because he man-marked the opponents with the ball too close'.
Id-Act	Rivoltare la frittata/la tovaglia	A mio parere, Domenico ha rivoltato la frittata quando ha scaricato tutta la responsabilità del furto sul suo complice. 'In my opinion, Domenico turned the tables when he gave the whole responsibility of the robbery to his accomplice'.
Id-P1	Rivoltare la frittata/la tovaglia	A mio parere, la frittata è stata rivoltata da Domenico quando ha scaricato tutta la responsabilità del furto sul suo complice. 'In my opinion, the omelette was flipped by Domenico when he gave the whole responsibility of the robbery to his accomplice'.
Id-P2	Rivoltare la frittata/la tovaglia	A mio parere, è stata rivoltata la frittata da Domenico quando ha scaricato tutta la responsabilità del furto sul suo complice. 'In my opinion, lit. was flipped the omelette by Domenico when he gave the whole responsibility of the robbery to his accomplice'.
Lit-Act	Rivoltare la frittata/la tovaglia	Come ultimo tentativo, Domenico ha rivoltato la tovaglia per vedere se per caso le sue chiavi di casa fossero rimaste lì. 'As a last attempt, Domenico turned the tablecloth inside out to see if by chance his house keys had been left there'.
Lit-P1	Rivoltare la frittata/la tovaglia	Come ultimo tentativo, la tovaglia è stata rivoltata da Domenico per vedere se per caso le sue chiavi di casa fossero rimaste lì. 'As a last attempt, the tablecloth was turned inside out by Domenico to see if by chance his house keys had been left there'.
Lit-P2	Rivoltare la frittata/la tovaglia	Come ultimo tentativo, è stata rivoltata la tovaglia da Domenico per vedere se per caso le sue chiavi di casa fossero rimaste lì. 'As a last attempt, lit. was turned inside out the tablecloth by Domenico to see if by chance his house keys had been left there'.
Id-Act	Rompere le scatole/gli occhiali	Come al solito, Angela ha rotto le scatole ai suoi genitori finché non le hanno comprato il vestito da sera che voleva. 'As usual, Angela bothered her parents until they bought her the evening dress she wanted'.
Id-P1	Rompere le scatole/gli occhiali	Come al solito, le scatole sono state rotte da Angela ai suoi genitori finché non le hanno comprato il vestito da sera che voleva. 'As usual, the boxes were smashed up by Angela to her parents until they bought her the evening dress she wanted'.
Id-P2	Rompere le scatole/gli occhiali	Come al solito, sono state rotte le scatole da Angela ai suoi genitori finché non le hanno comprato il vestito da sera che voleva. 'As usual, lit. were smashed up the boxes by Angela to her parents until they bought her the evening dress she wanted'.
Lit-Act	Rompere le scatole/gli occhiali	Giusto poco fa, Angela ha rotto gli occhiali a Leonardo perché ci si è seduta sopra senza vedere che erano sulla poltrona. 'Right a little while ago, Angela broke the glasses to Leonardo because she sat on them without noticing they were on the armchair'.
Lit-P1	Rompere le scatole/gli occhiali	Giusto poco fa, gli occhiali sono stati rotti da Angela a Leonardo perché ci si è seduta sopra senza vedere che erano sulla poltrona. 'Right a little while ago, the glasses were broken by Angela to Leonardo because she sat on them without noticing they were on the armchair'.
Lit-P2	Rompere le scatole/gli occhiali	Giusto poco fa, sono stati rotti gli occhiali da Angela a Leonardo perché ci si è seduta sopra senza vedere che erano sulla poltrona. 'Right a little while ago, lit. were broken the glasses by Angela to Leonardo because she sat on them without noticing they were on the armchair'.
Id-Act	Saltare il fosso/la corsia	A parer nostro, Mirko ha saltato il fosso con la sua decisione di smettere con il giornalismo e di buttarsi in politica. 'In our opinion, Mirko took the plunge with his decision to quit journalism and give politics a go'.
Id-P1	Saltare il fosso/la corsia	A parer nostro, il fosso è stato saltato da Mirko con la sua decisione di smettere con il giornalismo e di buttarsi in politica. 'In our opinion, lit. the ditch was jumped by Mirko with his decision to quit journalism and give politics a go'.
Id-P2	Saltare il fosso/la corsia	A parer nostro, è stato saltato il fosso da Mirko con la sua decisione di smettere con il giornalismo e di buttarsi in politica. 'In our opinion, lit. was jumped the ditch by Mirko with his decision to quit journalism and give politics a go'.
Lit-Act	Saltare il fosso/la corsia	Secondo il verbale, Mirko ha saltato la corsia con il suo tir, che è sfuggito al suo controllo ed è finito contro un muro. 'According to the minutes, Mirko jumped the lane with his truck, which he could not control anymore and hit a wall'.
Lit-P1	Saltare il fosso/la corsia	Secondo il verbale, la corsia è stata saltata da Mirko con il suo tir, che è sfuggito al suo controllo ed è finito contro un muro. 'According to the minutes, the lane was jumped by Mirko with his truck, which he could not control anymore and hit a wall'.

Lit-P2	Saltare il fosso/la corsia	Secondo il verbale, è stata saltata la corsia da Mirko con il suo tir, che è sfuggito al suo controllo ed è finito contro un muro. 'According to the minutes, lit. was jumped the lane by Mirko with his truck, which he could not control anymore and hit a wall'.
Id-Act	Salvare la faccia/l'affare	Con grande destrezza, Roberto ha salvato la faccia a tutta la squadra con un gol di pareggio segnato all'ultimo minuto. 'With great dexterity, Roberto saved the whole team's face with a net that led to a draw at the last minute'.
Id-P1	Salvare la faccia/l'affare	Con grande destrezza, la faccia è stata salvata da Roberto a tutta la squadra con un gol di pareggio segnato all'ultimo minuto. 'With great dexterity, the face was saved by Roberto to the whole team with a net that led to a draw at the last minute'.
Id-P2	Salvare la faccia/l'affare	Con grande destrezza, è stata salvata la faccia da Roberto a tutta la squadra con un gol di pareggio segnato all'ultimo minuto. 'With great dexterity, lit. was saved the face by Roberto to the whole team with a net that led to a draw at the last minute'.
Lit-Act	Salvare la faccia/l'affare	Dietro mio consiglio, Roberto ha salvato l'affare convocando una riunione all'ultimo per appianare le tensioni fra i soci. 'Following my advice, Roberto saved the deal by calling a meeting at the last moment to smooth over the tension among the associates'.
Lit-P1	Salvare la faccia/l'affare	Dietro mio consiglio, l'affare è stato salvato da Roberto convocando una riunione all'ultimo per appianare le tensioni fra i soci. 'Following my advice, the deal was saved by Roberto by calling a meeting at the last moment to smooth over the tension among the associates'.
Lit-P2	Salvare la faccia/l'affare	Dietro mio consiglio, è stato salvato l'affare da Roberto convocando una riunione all'ultimo per appianare le tensioni fra i soci. 'Following my advice, lit. was saved the deal by Roberto by calling a meeting at the last moment to smooth over the tension among the associates'.
Id-Act	Scavare la fossa/un solco	Senza alcun dubbio, Martina ha scavato la fossa al collega quando ha raccontato al capo che lui gli parlava alle spalle. 'Without any doubt, Martina dug her colleague an early grave when she told the boss that he was talking behind his back'.
Id-P1	Scavare la fossa/un solco	Senza alcun dubbio, la fossa è stata scavata da Martina al collega quando ha raccontato al capo che lui gli parlava alle spalle. 'Without any doubt, the ditch was dug by Martina to her colleague when she told the boss that he was talking behind his back'.
Id-P2	Scavare la fossa/un solco	Senza alcun dubbio, è stata scavata la fossa da Martina al collega quando ha raccontato al capo che lui gli parlava alle spalle. 'Without any doubt, lit. was dug the ditch by Martina to her colleague when she told the boss that he was talking behind his back'.
Lit-Act	Scavare la fossa/un solco	A quanto vedo, Martina ha scavato dei solchi nel terreno perché vuole realizzare un piccolo orto nel giardino di casa sua. 'As far as I can see, Martina dug some furrows into the ground because she wants to make a small vegetable garden in her garden'.
Lit-P1	Scavare la fossa/un solco	A quanto vedo, dei solchi sono stati scavati da Martina nel terreno perché vuole realizzare un piccolo orto nel giardino di casa sua. 'As far as I can see, lit. some furrows were dug by Martina into the ground because she wants to make a small vegetable garden in her garden'.
Lit-P2	Scavare la fossa/un solco	A quanto vedo, sono stati scavati dei solchi da Martina nel terreno perché vuole realizzare un piccolo orto nel giardino di casa sua. 'As far as I can see, lit. were dug some furrows by Martina into the ground because she wants to make a small vegetable garden in her garden'.
Id-Act	Scoprire le carte/il volto	Come mi aspettavo, Laura ha scoperto le carte quando Luca l'ha messa alle strette chiedendole i suoi piani per il futuro. 'As I was expecting, Laura tipped her hand when Luca cornered her asking her plans for the future'.
Id-P1	Scoprire le carte/il volto	Come mi aspettavo, le carte sono state scoperte da Laura quando Luca l'ha messa alle strette chiedendole i suoi piani per il futuro. 'As I was expecting, the cards were uncovered by Laura when Luca cornered her asking her plans for the future'.
Id-P2	Scoprire le carte/il volto	Come mi aspettavo, sono state scoperte le carte da Laura quando Luca l'ha messa alle strette chiedendole i suoi piani per il futuro. 'As I was expecting, lit. were uncovered the cards by Laura when Luca cornered her asking her plans for the future'.
Lit-Act	Scoprire le carte/il volto	A quanto raccontano, Laura ha scoperto il volto solo quando gli agenti le hanno detto di identificarsi al posto di blocco. 'From what I hear, Laura uncovered the face only when the agents asked her to show identification at the road block'.

Lit-P1	Scoprire le carte/il volto	A quanto raccontano, il volto è stato scoperto da Laura solo quando gli agenti le hanno detto di identificarsi al posto di blocco. 'From what I hear, the face was uncovered by Laura only when the agents asked her to show identification at the road block'.
Lit-P2	Scoprire le carte/il volto	A quanto raccontano, è stato scoperto il volto da Laura solo quando gli agenti le hanno detto di identificarsi al posto di blocco. 'From what I hear, lit. was uncovered the face by Laura only when the agents asked her to show identification at the road block'.
Id-Act	Segare le gambe/le catene	A quanto dicono, Federica ha segato le gambe ai suoi alunni con quel compito in classe a sorpresa sull'arte neoclassica. 'From what I hear, lit. Federica hamstring her pupils with that surprise test on Neoclassic Art'.
Id-P1	Segare le gambe/le catene	A quanto dicono, le gambe sono state segate da Federica ai suoi alunni con quel compito in classe a sorpresa sull'arte neoclassica. 'From what I hear, the legs were sawed by Federica to her pupils with that surprise test on Neoclassical Art'.
Id-P2	Segare le gambe/le catene	A quanto dicono, sono state segate le gambe da Federica ai suoi alunni con quel compito in classe a sorpresa sull'arte neoclassica. 'From what I hear, lit. were sawed the legs by Federica to her pupils with that surprise test on Neoclassical Art'.
Lit-Act	Segare le gambe/le catene	Con estrema rapidità, Federica ha segato le catene al prigioniero perché potesse fuggire prima che arrivassero le guardie. 'Very quickly, Federica sawed the chains to the prisoner so that he could flee before the guards arrived'.
Lit-P1	Segare le gambe/le catene	Con estrema rapidità, le catene sono state segate da Federica al prigioniero perché potesse fuggire prima che arrivassero le guardie. 'Very quickly, the chains were sawed by Federica to the prisoner so that he could flee before the guards arrived'.
Lit-P2	Segare le gambe/le catene	Con estrema rapidità, sono state segate le catene da Federica al prigioniero perché potesse fuggire prima che arrivassero le guardie. 'Very quickly, lit. were sawed the chains by Federica to the prisoner so that he could flee before the guards arrived'.
Id-Act	Spezzare una lancia/il calice	Senza alcun dubbio, Franca ha spezzato una lancia in favore della sorella quando ha convinto la madre a lasciarla uscire. 'Without any doubt, Franca put in a good word for her sister when she convinced her mother to let her go out'.
Id-P1	Spezzare una lancia/il calice	Senza alcun dubbio, una lancia è stata spezzata da Franca in favore della sorella quando ha convinto la madre a lasciarla uscire. 'Without any doubt, a spear was broken by Franca in favor of her sister when she convinced her mother to let her go out'.
Id-P2	Spezzare una lancia/il calice	Senza alcun dubbio, è stata spezzata una lancia da Franca in favore della sorella quando ha convinto la madre a lasciarla uscire. 'Without any doubt, lit. was broken a spear by Franca in favor of her sister when she convinced her mother to let her go out'.
Lit-Act	Spezzare una lancia/il calice	A quanto dicono, Franca ha spezzato il calice mentre brindava agli sposi perché lo teneva troppo stretto per l'agitazione. 'From what I hear, Franca broke the stem glass during a toast to the bride and the groom because she was holding it too tightly for her anxiety'.
Lit-P1	Spezzare una lancia/il calice	A quanto dicono, il calice è stato spezzato da Franca mentre brindava agli sposi perché lo teneva troppo stretto per l'agitazione. 'From what I hear, the stem glass was broken by Franca during a toast to the bride and the groom because she was holding it too tightly for her anxiety'.
Lit-P2	Spezzare una lancia/il calice	A quanto dicono, è stato spezzato il calice da Franca mentre brindava agli sposi perché lo teneva troppo stretto per l'agitazione. 'From what I hear, lit. was broken the stem glass by Franca during a toast to the bride and the groom because she was holding it too tightly for her anxiety'.
Id-Act	Sputare i polmoni/un insetto	Come ogni volta, Samuele ha sputato i polmoni durante la corsa campestre, perché non possiede un fisico adatto alla gara. 'Like every time, Samuele toiled away during the cross-country race, because his physique is not apt to the competition'.
Id-P1	Sputare i polmoni/un insetto	Come ogni volta, i polmoni sono stati sputati da Samuele durante la corsa campestre, perché non possiede un fisico adatto alla gara. 'Like every time, the lungs were spat out by Samuele during the cross-country race, because his physique is not apt to the competition'.
Id-P2	Sputare i polmoni/un insetto	Come ogni volta, sono stati sputati i polmoni da Samuele durante la corsa campestre, perché non possiede un fisico adatto alla gara. 'Like every time, lit. were spat out the lungs by Samuele during the cross-country race, because his physique is not apt to the competition'.

Lit-Act	Sputare i polmoni/un insetto	Con enorme disgusto, Samuele ha sputato un insetto mentre stava pranzando poco fa perché gli era finito nella minestra. 'With great disgust, Samuele spit an insect during lunch a few moments ago because it ended up in his soup'.
Lit-P1	Sputare i polmoni/un insetto	Con enorme disgusto, un insetto è stato sputato da Samuele mentre stava pranzando poco fa perché gli era finito nella minestra. 'With great disgust, an insect was spat by Samuele during lunch a few moments ago because it ended up in his soup'.
Lit-P2	Sputare i polmoni/un insetto	Con enorme disgusto, è stato sputato un insetto da Samuele mentre stava pranzando poco fa perché gli era finito nella minestra. 'With great disgust, lit. was spat an insect by Samuele during lunch a few moments ago because it ended up in his soup'.
Id-Act	Staccare la spina/la sella	Come ogni anno, Leonardo ha staccato la spina per qualche giorno dopo la sessione di esami con un fine settimana al mare. 'Like every year, Leonardo took a break for some days after the exam sessions with a seaside weekend'.
Id-P1	Staccare la spina/la sella	Come ogni anno, la spina è stata staccata da Leonardo per qualche giorno dopo la sessione di esami con un fine settimana al mare. 'Like every year, the plug was pulled by Leonardo for some days after the exam sessions with a seaside weekend'.
Id-P2	Staccare la spina/la sella	Come ogni anno, è stata staccata la spina da Leonardo per qualche giorno dopo la sessione di esami con un fine settimana al mare. 'Like every year, lit. was pulled the plug by Leonardo for some days after the exam sessions with a seaside weekend'.
Lit-Act	Staccare la spina/la sella	Senza alcun aiuto, Leonardo ha staccato la sella alla sua vecchia bicicletta per sostituirla con una nuova e più comoda. 'With no help from anyone, Leonardo removed the saddle by Leonardo from his old bike to replace it with a new more comfortable one'.
Lit-P1	Staccare la spina/la sella	Senza alcun aiuto, la sella è stata staccata da Leonardo alla sua vecchia bicicletta per sostituirla con una nuova e più comoda. 'With no help from anyone, the saddle was removed by Leonardo from his old bike to replace it with a new more comfortable one'.
Lit-P2	Staccare la spina/la sella	Senza alcun aiuto, è stata staccata la sella da Leonardo alla sua vecchia bicicletta per sostituirla con una nuova e più comoda. 'With no help from anyone, lit. was removed the saddle by Leonardo from his old bike to replace it with a new more comfortable one'.
Id-Act	Stringere i denti/le ruote	Con grande sforzo, Mauro ha stretto i denti durante l'ultima parte dell'arrampicata, benché fosse ormai privo di forze. 'With great effort, Mauro gritted his teeth in the final stage of his climb, although at this point he was weak'.
Id-P1	Stringere i denti/le ruote	Con grande sforzo, i denti sono stati stretti da Mauro durante l'ultima parte dell'arrampicata, benché fosse ormai privo di forze. 'With great effort, the teeth were gritted by Mauro in the final stage of his climb, although at this point he was weak'.
Id-P2	Stringere i denti/le ruote	Con grande sforzo, sono stati stretti i denti da Mauro durante l'ultima parte dell'arrampicata, benché fosse ormai privo di forze. 'With great effort, lit. were gritted the teeth by Mauro in the final stage of his climb, although at this point he was weak'.
Lit-Act	Stringere i denti/le ruote	Su mio consiglio, Mauro ha stretto le ruote alla sua vecchia bicicletta con una chiave inglese perché si erano allentate. 'Following my advice, Mauro screwed the wheels to his old bike with a wrench because they had slackened'.
Lit-P1	Stringere i denti/le ruote	Su mio consiglio, le ruote sono state strette da Mauro alla sua vecchia bicicletta con una chiave inglese perché si erano allentate. 'Following my advice, the wheels were screwed by Mauro to his old bike with a wrench because they had slackened'.
Lit-P2	Stringere i denti/le ruote	Su mio consiglio, sono state strette le ruote da Mauro alla sua vecchia bicicletta con una chiave inglese perché si erano allentate. 'Following my advice, lit. were screwed the wheels by Mauro to his old bike with a wrench because they had slackened'.
Id-Act	Subire uno scacco/uno scippo	Senza alcun dubbio, Giulio ha subito uno scacco alle elezioni quando i cittadini hanno votato come sindaco il suo rivale. 'Without any doubt, Giulio suffered a setback at the elections when the citizens voted his rival as the new mayor'.
Id-P1	Subire uno scacco/uno scippo	Senza alcun dubbio, uno scacco è stato subito da Giulio alle elezioni quando i cittadini hanno votato come sindaco il suo rivale. 'Without any doubt, a checkmate was suffered by Giulio at the elections when the citizens voted his rival as the new mayor'.
Id-P2	Subire uno scacco/uno scippo	Senza alcun dubbio, è stato subito uno scacco da Giulio alle elezioni quando i cittadini hanno votato come sindaco il suo rivale. 'Without any doubt, lit. was suffered a checkmate by Giulio at the elections when the citizens voted his rival as the new mayor'.
Lit-Act	Subire uno scacco/uno scippo	A quanto dicono, Giulio ha subito uno scippo quando è salito sulla metropolitana poiché gli era rimasto aperto lo zaino. 'From what I hear, Giulio suffered a mugging when he got on the subway because he left his backpack open'.
Lit-P1	Subire uno scacco/uno scippo	A quanto dicono, uno scippo è stato subito da Giulio quando è salito sulla metropolitana poiché gli era rimasto aperto lo zaino. 'From what I hear, a mugging was suffered by Giulio when he got on the subway because he left his backpack open'.

Lit-P2	Subire uno scacco/uno scippo	A quanto dicono, è stato subito uno scippo da Giulio quando è salito sulla metropolitana poiché gli era rimasto aperto lo zaino. 'From what I hear, lit. was suffered a mugging by Giulio when he got on the subway because he left his backpack open'.
Id-Act	Tagliare la corda/la barba	A quanto so, Giorgio ha tagliato la corda perché la serata di gala a cui lo avevano invitato era ormai diventata noiosa. 'As far as I know, Giorgio slipped away because the gala evening they had invited him to had at this point got boring'.
Id-P1	Tagliare la corda/la barba	A quanto so, la corda è stata tagliata da Giorgio perché la serata di gala a cui lo avevano invitato era ormai diventata noiosa. 'As far as I know, the rope was cut by Giorgio because the gala evening they had invited him to had at this point got boring'.
Id-P2	Tagliare la corda/la barba	A quanto so, è stata tagliata la corda da Giorgio perché la serata di gala a cui lo avevano invitato era ormai diventata noiosa. 'As far as I know, lit. was cut the rope by Giorgio because the gala evening they had invited him to had at this point got boring'.
Lit-Act	Tagliare la corda/la barba	Su mio consiglio, Giorgio ha tagliato la barba in vista del colloquio di lavoro dato che era troppo lunga e disordinata. 'Following my advice, Giorgio trimmed his beard in preparation for the job interview since it was too long and messy'.
Lit-P1	Tagliare la corda/la barba	Su mio consiglio, la barba è stata tagliata da Giorgio in vista del colloquio di lavoro dato che era troppo lunga e disordinata. 'Following my advice, the beard was trimmed by Giorgio in preparation for the job interview since it was too long and messy'.
Lit-P2	Tagliare la corda/la barba	Su mio consiglio, è stata tagliata la barba da Giorgio in vista del colloquio di lavoro dato che era troppo lunga e disordinata. 'Following my advice, lit. was trimmed the beard by Giorgio in preparation for the job interview since it was too long and messy'.
Id-Act	Tentare la sorte/un furto	Senza alcun dubbio, Michela ha tentato la sorte quando si è trasferita a New York per iniziare una scuola di recitazione. 'Without any doubt, Michela tried her luck when she moved to New York to start an acting school'.
Id-P1	Tentare la sorte/un furto	Senza alcun dubbio, la sorte è stata tentata da Michela quando si è trasferita a New York per iniziare una scuola di recitazione. 'Without any doubt, the luck was tried by Michela when she moved to New York to start an acting school'.
Id-P2	Tentare la sorte/un furto	Senza alcun dubbio, è stata tentata la sorte da Michela quando si è trasferita a New York per iniziare una scuola di recitazione. 'Without any doubt, lit. was tried the luck by Michela when she moved to New York to start an acting school'.
Lit-Act	Tentare la sorte/un furto	Come ultima risorsa, Michela ha tentato un furto con il compagno poiché erano entrambi disperati e bisognosi di denaro. 'As a last resort, Michela attempted a robbery with her partner because they were both desperate and needed money'.
Lit-P1	Tentare la sorte/un furto	Come ultima risorsa, un furto è stato tentato da Michela con il compagno poiché erano entrambi disperati e bisognosi di denaro. 'As a last resort, a robbery was attempted by Michela with her partner because they were both desperate and needed money'.
Lit-P2	Tentare la sorte/un furto	Come ultima risorsa, è stato tentato un furto da Michela con il compagno poiché erano entrambi disperati e bisognosi di denaro. 'As a last resort, lit. was attempted a robbery by Michela with her partner because they were both desperate and needed money'.
Id-Act	Tirare la corda/il freno	A parer nostro, Greta ha tirato la corda con tutte quelle richieste di attenzione e scenate di gelosia fatte al fidanzato. 'In our opinion, Greta took things too far with all those cries for attention and jealous fits made to her boyfriend'.
Id-P1	Tirare la corda/il freno	A parer nostro, la corda è stata tirata da Greta con tutte quelle richieste di attenzione e scenate di gelosia fatte al fidanzato. 'In our opinion, the rope was pulled by Greta with all those cries for attention and jealous fits made to her boyfriend'.
Id-P2	Tirare la corda/il freno	A parer nostro, è stata tirata la corda da Greta con tutte quelle richieste di attenzione e scenate di gelosia fatte al fidanzato. 'In our opinion, lit. was pulled the rope by Greta with all those cries for attention and jealous fits made to her boyfriend'.
Lit-Act	Tirare la corda/il freno	Con grande prontezza, Greta ha tirato il freno appena in tempo perché la macchina inchiodasse e non travolgesse il pedone. 'With great readiness, Greta pulled the brake just in time for the car to stop and not run over the pedestrian'.
Lit-P1	Tirare la corda/il freno	Con grande prontezza, il freno è stato tirato da Greta appena in tempo perché la macchina inchiodasse e non travolgesse il pedone. 'With great readiness, the brake was pulled by Greta just in time for the car to stop and not run over the pedestrian'.
Lit-P2	Tirare la corda/il freno	Con grande prontezza, è stato tirato il freno da Greta appena in tempo perché la macchina inchiodasse e non travolgesse il pedone. 'With great readiness, lit. was pulled the brake by Greta just in time for the car to stop and not run over the pedestrian'.
Id-Act	Trovare la chiave/del denaro	Con grande soddisfazione, Veronica ha trovato la chiave dopo lunghi ragionamenti su come risolvere quel quesito di logica. 'With great satisfaction, Veronica found the key after thinking how to resolve that logic problem for a long time'.
Id-P1	Trovare la chiave/del denaro	Con grande soddisfazione, la chiave è stata trovata da Veronica dopo lunghi ragionamenti su come risolvere quel quesito di logica. 'With great satisfaction, the key was found by Veronica after thinking how to resolve that logic problem for a long time'.

Id-P2	Trovare la chiave/del denaro	Con grande soddisfazione, è stata trovata la chiave da Veronica dopo lunghi ragionamenti su come risolvere quel quesito di logica. 'With great satisfaction, lit. was found the key by Veronica after thinking how to resolve that logic problem for a long time'.
Lit-Act	Trovare la chiave/del denaro	Con enorme fortuna, Veronica ha trovato del denaro sul pavimento del vagone accanto al posto che le era stato assegnato. 'With great luck, Veronica found some money on the wagon's floor next to her assigned seat'.
Lit-P1	Trovare la chiave/del denaro	Con enorme fortuna, del denaro è stato trovato da Veronica sul pavimento del vagone accanto al posto che le era stato assegnato. 'With great luck, some money was found by Veronica on the wagon's floor next to her assigned seat'.
Lit-P2	Trovare la chiave/del denaro	Con enorme fortuna, è stato trovato del denaro da Veronica sul pavimento del vagone accanto al posto che le era stato assegnato. 'With great luck, lit. was found some money by Veronica on the wagon's floor next to her assigned seat'.
Id-Act	Urtare i nervi/il polso	A quanto vedo, Margherita ha urtato i nervi al conducente da quando si è messa a gridare con le sue amiche sull'autobus. 'As far as I see, Margherita go on the driver's nerves since she started shouting with her friends on the bus'.
Id-P1	Urtare i nervi/il polso	A quanto vedo, i nervi sono stati urtati da Margherita al conducente da quando si è messa a gridare con le sue amiche sull'autobus. 'As far as I see, the nerves were hit by Margherita to the driver since she started shouting with her friends on the bus'.
Id-P2	Urtare i nervi/il polso	A quanto vedo, sono stati urtati i nervi da Margherita al conducente da quando si è messa a gridare con le sue amiche sull'autobus. 'As far as I see, lit. were hit the nerves by Margherita to the driver since she started shouting with her friends on the bus'.
Lit-Act	Urtare i nervi/il polso	Durante la cena, Margherita ha urtato il polso contro il cassetto della cucina perché non si era accorta che fosse aperto. 'During the dinner, Margherita hit her wrist against the kitchen drawer because she did not realize it was open'.
Lit-P1	Urtare i nervi/il polso	Durante la cena, il polso è stato urtato da Margherita contro il cassetto della cucina perché non si era accorta che fosse aperto. 'During the dinner, the wrist was hit by Margherita against the kitchen drawer because she did not realize it was open'.
Lit-P2	Urtare i nervi/il polso	Durante la cena, è stato urtato il polso da Margherita contro il cassetto della cucina perché non si era accorta che fosse aperto. 'During the dinner, lit. was hit the wrist by Margherita against the kitchen drawer because she did not realize it was open'.
Id-Act	Vedere le stelle/la rapina	Come era prevedibile, Claudia ha visto le stelle dopo che ha violentemente sbattuto la testa contro l'anta dell'armadio. 'Predictably, Claudia saw stars after violently hitting her head against the wardrobe's door'.
Id-P1	Vedere le stelle/la rapina	Come era prevedibile, le stelle sono state viste da Claudia dopo che ha violentemente sbattuto la testa contro l'anta dell'armadio. 'Predictably, the stars were seen by Claudia after violently hitting her head against the wardrobe's door'.
Id-P2	Vedere le stelle/la rapina	Come era prevedibile, sono state viste le stelle da Claudia dopo che ha violentemente sbattuto la testa contro l'anta dell'armadio. 'Predictably, lit. were seen the stars by Claudia after violently hitting her head against the wardrobe's door'.
Lit-Act	Vedere le stelle/la rapina	Secondo il giornale, Claudia ha visto la rapina dalla finestra, dal momento che abita di fronte al negozio in questione. 'According to the newspaper, Claudia saw the robbery from the window, since she lives in front of the shop at issue'.
Lit-P1	Vedere le stelle/la rapina	Secondo il giornale, la rapina è stata vista da Claudia dalla finestra, dal momento che abita di fronte al negozio in questione. 'According to the newspaper, the robbery was seen by Claudia from the window, since she lives in front of the shop at issue'.
Lit-P2	Vedere le stelle/la rapina	Secondo il giornale, è stata vista la rapina da Claudia dalla finestra, dal momento che abita di fronte al negozio in questione. 'According to the newspaper, lit. was seen the robbery by Claudia from the window, since she lives in front of the shop at issue'.
Id-Act	Vuotare il sacco/il pozzo	Secondo il verbale, Massimo ha vuotato il sacco sull'identità del complice solo dopo ore di interrogatorio con la polizia. 'According to the memo, Massimo spilled the beans on the identity of the culprit after being interrogated for two hours by the Police'.
Id-P1	Vuotare il sacco/il pozzo	Secondo il verbale, il sacco è stato vuotato da Massimo sull'identità del complice solo dopo ore di interrogatorio con la polizia. 'According to the memo, the sack was emptied by Massimo on the identity of the culprit after being interrogated for two hours by the Police'.
Id-P2	Vuotare il sacco/il pozzo	Secondo il verbale, è stato vuotato il sacco da Massimo sull'identità del complice solo dopo ore di interrogatorio con la polizia. 'According to the memo, lit. was emptied the sack by Massimo on the identity of the culprit after being interrogated for two hours by the Police'.

Lit-Act	Vuotare il sacco/il pozzo	A grande richiesta, Massimo ha vuotato il pozzo in giardino dato che l'odore dell'acqua stagnante era ormai insostenibile. 'By popular demand, Massimo emptied the well in the garden because the smell of stagnant water was by now unbearable'.
Lit-P1	Vuotare il sacco/il pozzo	A grande richiesta, il pozzo è stato vuotato da Massimo in giardino dato che l'odore dell'acqua stagnante era ormai insostenibile. 'By popular demand, the well in the garden was emptied by Massimo because the smell of stagnant water was by now unbearable'.
Lit-P2	Vuotare il sacco/il pozzo	A grande richiesta, è stato vuotato il pozzo da Massimo in giardino dato che l'odore dell'acqua stagnante era ormai insostenibile. 'By popular demand, lit. was emptied the well in the garden by Massimo because the smell of stagnant water was by now unbearable'.

B.5 Naturalness and cloze probability ratings for experiment 2

Condition	Item	Naturalness	Cloze w2
Id-Pass1	Abbassare la cresta/lo stereo	5	91.67%
Id-Pass2	Abbassare la cresta/lo stereo	5.4	66.67%
Lit-Pass1	Abbassare la cresta/lo stereo	4.5	
Lit-Pass2	Abbassare la cresta/lo stereo	5	
Id-Pass1	Accusare il colpo/la banca	4.9	41.67%
Id-Pass2	Accusare il colpo/la banca	5.7	91.67%
Lit-Pass1	Accusare il colpo/la banca	5.8	
Lit-Pass2	Accusare il colpo/la banca	4.5	
Id-Pass1	Allungare il muso/la gita	5.3	16.67%
Id-Pass2	Allungare il muso/la gita	4.7	83.33%
Lit-Pass1	Allungare il muso/la gita	6.6	
Lit-Pass2	Allungare il muso/la gita	4.1	
Id-Pass1	Alzare la voce/il libro	5.2	91.67%
Id-Pass2	Alzare la voce/il libro	5.8	33.33%
Lit-Pass1	Alzare la voce/il libro	5.3	
Lit-Pass2	Alzare la voce/il libro	4.9	
Id-Pass1	Aprire gli occhi/uno studio	3.7	66.67%
Id-Pass2	Aprire gli occhi/uno studio	5.5	75.00%
Lit-Pass1	Aprire gli occhi/uno studio	5.3	
Lit-Pass2	Aprire gli occhi/uno studio	5.8	
Id-Pass1	Attaccare un bottone/la lampada	4.3	66.67%
Id-Pass2	Attaccare un bottone/la lampada	3.1	58.33%
Lit-Pass1	Attaccare un bottone/la lampada	3.8	

Lit-Pass2	Attaccare un bottone/la lampada	4.1	
Id-Pass1	Avvelenare il fegato/il rivale	3.6	0.00%
Id-Pass2	Avvelenare il fegato/il rivale	5.7	8.33%
Lit-Pass1	Avvelenare il fegato/il rivale	4.4	
Lit-Pass2	Avvelenare il fegato/il rivale	4.1	
Id-Pass1	Battere la fiacca/lo stinco	5.3	100.00%
Id-Pass2	Battere la fiacca/lo stinco	5.8	75.00%
Lit-Pass1	Battere la fiacca/lo stinco	5.4	
Lit-Pass2	Battere la fiacca/lo stinco	6	
Id-Pass1	Brucciare le tappe/la carne	3.9	66.67%
Id-Pass2	Brucciare le tappe/la carne	5.5	100.00%
Lit-Pass1	Brucciare le tappe/la carne	5.3	
Lit-Pass2	Brucciare le tappe/la carne	3.8	
Id-Pass1	Chiudere il becco/l'uscio	4.1	100.00%
Id-Pass2	Chiudere il becco/l'uscio	4.9	58.33%
Lit-Pass1	Chiudere il becco/l'uscio	4.9	
Lit-Pass2	Chiudere il becco/l'uscio	3.4	
Id-Pass1	Contare le pecore/gli alunni	2.9	91.67%
Id-Pass2	Contare le pecore/gli alunni	4.7	75.00%
Lit-Pass1	Contare le pecore/gli alunni	5.6	
Lit-Pass2	Contare le pecore/gli alunni	2.3	
Id-Pass1	Coprire le spalle/il tavolo	3.2	75.00%
Id-Pass2	Coprire le spalle/il tavolo	5.6	66.67%
Lit-Pass1	Coprire le spalle/il tavolo	6.2	
Lit-Pass2	Coprire le spalle/il tavolo	5	
Id-Pass1	Cucire le labbra/la manica	4.4	25.00%
Id-Pass2	Cucire le labbra/la manica	4.7	100.00%
Lit-Pass1	Cucire le labbra/la manica	5.6	

Lit-Pass2	Cucire le labbra/la manica	3.2	
Id-Pass1	Dare i numeri/un titolo	3.9	75.00%
Id-Pass2	Dare i numeri/un titolo	6.1	66.67%
Lit-Pass1	Dare i numeri/un titolo	4.1	
Lit-Pass2	Dare i numeri/un titolo	4.2	
Id-Pass1	Fare una croce/una piega	6.1	8.33%
Id-Pass2	Fare una croce/una piega	3.8	8.33%
Lit-Pass1	Fare una croce/una piega	6.1	
Lit-Pass2	Fare una croce/una piega	5.4	
Id-Pass1	Ferire il cuore/un piede	4.9	0.00%
Id-Pass2	Ferire il cuore/un piede	5.4	58.33%
Lit-Pass1	Ferire il cuore/un piede	4.2	
Lit-Pass2	Ferire il cuore/un piede	5.9	
Id-Pass1	Ficcare il naso/dei pali	4.8	75.00%
Id-Pass2	Ficcare il naso/dei pali	2	100.00%
Lit-Pass1	Ficcare il naso/dei pali	5	
Lit-Pass2	Ficcare il naso/dei pali	3.1	
Id-Pass1	Frenare la lingua/la strage	3.7	41.67%
Id-Pass2	Frenare la lingua/la strage	2.7	58.33%
Lit-Pass1	Frenare la lingua/la strage	6.1	
Lit-Pass2	Frenare la lingua/la strage	4.8	
Id-Pass1	Gettare la spugna/il fucile	4.8	83.33%
Id-Pass2	Gettare la spugna/il fucile	1.8	100.00%
Lit-Pass1	Gettare la spugna/il fucile	5.2	
Lit-Pass2	Gettare la spugna/il fucile	1.9	
Id-Pass1	Imparare la lezione/una poesia	3.5	66.67%
Id-Pass2	Imparare la lezione/una poesia	3.1	100.00%
Lit-Pass1	Imparare la lezione/una poesia	4.9	

Lit-Pass2	Imparare la lezione/una poesia	4.9	
Id-Pass1	Indorare la pillola/cornice	5.3	50.00%
Id-Pass2	Indorare la pillola/cornice	3.2	91.67%
Lit-Pass1	Indorare la pillola/cornice	4.1	
Lit-Pass2	Indorare la pillola/cornice	3.7	
Id-Pass1	Ingoiare il rospo/la zuppa	4.4	58.33%
Id-Pass2	Ingoiare il rospo/la zuppa	2.2	100.00%
Lit-Pass1	Ingoiare il rospo/la zuppa	3.8	
Lit-Pass2	Ingoiare il rospo/la zuppa	2.3	
Id-Pass1	Invertire la rotta/la marcia	3.9	25.00%
Id-Pass2	Invertire la rotta/la marcia	2.8	91.67%
Lit-Pass1	Invertire la rotta/la marcia	4.9	
Lit-Pass2	Invertire la rotta/la marcia	5.4	
Id-Pass1	Lasciare il segno/la spesa	3.5	50.00%
Id-Pass2	Lasciare il segno/la spesa	3.7	75.00%
Lit-Pass1	Lasciare il segno/la spesa	5.5	
Lit-Pass2	Lasciare il segno/la spesa	5.8	
Id-Pass1	Legare le mani/una rete	5.2	91.67%
Id-Pass2	Legare le mani/una rete	5.2	100.00%
Lit-Pass1	Legare le mani/una rete	5.7	
Lit-Pass2	Legare le mani/una rete	4.6	
Id-Pass1	Lustrare le scarpe/i mobili	1.6	25.00%
Id-Pass2	Lustrare le scarpe/i mobili	3.3	91.67%
Lit-Pass1	Lustrare le scarpe/i mobili	5.3	
Lit-Pass2	Lustrare le scarpe/i mobili	2.3	
Id-Pass1	Mancare il bersaglio/la votazione	4.5	83.33%
Id-Pass2	Mancare il bersaglio/la votazione	2	25.00%
Lit-Pass1	Mancare il bersaglio/la votazione	5	

Lit-Pass2	Mancare il bersaglio/la votazione	5	
Id-Pass1	Mangiare la foglia/un panino	3.3	91.67%
Id-Pass2	Mangiare la foglia/un panino	1.2	58.33%
Lit-Pass1	Mangiare la foglia/un panino	5.7	
Lit-Pass2	Mangiare la foglia/un panino	4.4	
Id-Pass1	Mettere le corna/le pizze	4.1	58.33%
Id-Pass2	Mettere le corna/le pizze	1.5	91.67%
Lit-Pass1	Mettere le corna/le pizze	3.4	
Lit-Pass2	Mettere le corna/le pizze	4.3	
Id-Pass1	Montare la testa/la scena	5	100.00%
Id-Pass2	Montare la testa/la scena	1.4	100.00%
Lit-Pass1	Montare la testa/la scena	4.5	
Lit-Pass2	Montare la testa/la scena	5.4	
Id-Pass1	Mozzare il fiato/il collo	3.4	0.00%
Id-Pass2	Mozzare il fiato/il collo	4.7	100.00%
Lit-Pass1	Mozzare il fiato/il collo	2.7	
Lit-Pass2	Mozzare il fiato/il collo	4.6	
Id-Pass1	Passare il testimone/il biglietto	4.6	100.00%
Id-Pass2	Passare il testimone/il biglietto	2.8	66.67%
Lit-Pass1	Passare il testimone/il biglietto	4	
Lit-Pass2	Passare il testimone/il biglietto	3.6	
Id-Pass1	Perdere il filo/una foto	5.2	41.67%
Id-Pass2	Perdere il filo/una foto	3.5	75.00%
Lit-Pass1	Perdere il filo/una foto	2.1	
Lit-Pass2	Perdere il filo/una foto	4.4	
Id-Pass1	Piantare le tende/delle palme	5.5	16.67%
Id-Pass2	Piantare le tende/delle palme	3.9	33.33%
Lit-Pass1	Piantare le tende/delle palme	3.3	

Lit-Pass2	Piantare le tende/delle palme	3.6	
Id-Pass1	Portare i pantaloni/il cappello	4.5	41.67%
Id-Pass2	Portare i pantaloni/il cappello	3.5	91.67%
Lit-Pass1	Portare i pantaloni/il cappello	4.4	
Lit-Pass2	Portare i pantaloni/il cappello	4.9	
Id-Pass1	Prendere una cotta/una felpa	5.2	66.67%
Id-Pass2	Prendere una cotta/una felpa	4.2	66.67%
Lit-Pass1	Prendere una cotta/una felpa	3.8	
Lit-Pass2	Prendere una cotta/una felpa	4.2	
Id-Pass1	Preparare il terreno/il viaggio	4.8	8.33%
Id-Pass2	Preparare il terreno/il viaggio	4.7	41.67%
Lit-Pass1	Preparare il terreno/il viaggio	4.7	
Lit-Pass2	Preparare il terreno/il viaggio	4.4	
Id-Pass1	Puntare il dito/la spada	3.9	100.00%
Id-Pass2	Puntare il dito/la spada	4.1	83.33%
Lit-Pass1	Puntare il dito/la spada	4.5	
Lit-Pass2	Puntare il dito/la spada	5.8	
Id-Pass1	Raggiungere il traguardo/l aeroporto	4	91.67%
Id-Pass2	Raggiungere il traguardo/l aeroporto	4.1	75.00%
Lit-Pass1	Raggiungere il traguardo/l aeroporto	2.5	
Lit-Pass2	Raggiungere il traguardo/l aeroporto	4.9	
Id-Pass1	Reggere la candela/il tendone	5.2	25.00%
Id-Pass2	Reggere la candela/il tendone	6.2	50.00%
Lit-Pass1	Reggere la candela/il tendone	5.9	
Lit-Pass2	Reggere la candela/il tendone	5.7	
Id-Pass1	Rischiare le penne/dei falli	3.9	33.33%
Id-Pass2	Rischiare le penne/dei falli	4.4	50.00%
Lit-Pass1	Rischiare le penne/dei falli	2.9	

Lit-Pass2	Rischiare le penne/dei falli	4.6	
Id-Pass1	Rivoltare la frittata/la tovaglia	6.3	0.00%
Id-Pass2	Rivoltare la frittata/la tovaglia	5.3	100.00%
Lit-Pass1	Rivoltare la frittata/la tovaglia	4.8	
Lit-Pass2	Rivoltare la frittata/la tovaglia	4.6	
Id-Pass1	Rompere le scatole/gli occhiali	5.2	91.67%
Id-Pass2	Rompere le scatole/gli occhiali	2.8	83.33%
Lit-Pass1	Rompere le scatole/gli occhiali	3	
Lit-Pass2	Rompere le scatole/gli occhiali	4.7	
Id-Pass1	Saltare il fosso/la corsia	4.3	58.33%
Id-Pass2	Saltare il fosso/la corsia	4.4	33.33%
Lit-Pass1	Saltare il fosso/la corsia	3.6	
Lit-Pass2	Saltare il fosso/la corsia	5.2	
Id-Pass1	Salvare la faccia/l'affare	5.7	75.00%
Id-Pass2	Salvare la faccia/l'affare	2.5	0.00%
Lit-Pass1	Salvare la faccia/l'affare	2.9	
Lit-Pass2	Salvare la faccia/l'affare	5.6	
Id-Pass1	Scavare la fossa/un solco	3.7	100.00%
Id-Pass2	Scavare la fossa/un solco	4.4	100.00%
Lit-Pass1	Scavare la fossa/un solco	2.7	
Lit-Pass2	Scavare la fossa/un solco	3.8	
Id-Pass1	Scoprire le carte/il volto	5.2	83.33%
Id-Pass2	Scoprire le carte/il volto	4.6	83.33%
Lit-Pass1	Scoprire le carte/il volto	3.8	
Lit-Pass2	Scoprire le carte/il volto	3.2	
Id-Pass1	Segare le gambe/le catene	4.5	0.00%
Id-Pass2	Segare le gambe/le catene	4.8	83.33%
Lit-Pass1	Segare le gambe/le catene	2.3	

Lit-Pass2	Segare le gambe/le catene	3.4	
Id-Pass1	Spezzare una lancia/il calice	5	91.67%
Id-Pass2	Spezzare una lancia/il calice	5.3	91.67%
Lit-Pass1	Spezzare una lancia/il calice	4.4	
Lit-Pass2	Spezzare una lancia/il calice	4.1	
Id-Pass1	Sputare i polmoni/un insetto	4.9	0.00%
Id-Pass2	Sputare i polmoni/un insetto	5.9	33.33%
Lit-Pass1	Sputare i polmoni/un insetto	4.9	
Lit-Pass2	Sputare i polmoni/un insetto	4.7	
Id-Pass1	Staccare la spina/la sella	4.5	66.67%
Id-Pass2	Staccare la spina/la sella	3.4	75.00%
Lit-Pass1	Staccare la spina/la sella	5.8	
Lit-Pass2	Staccare la spina/la sella	3.6	
Id-Pass1	Stringere i denti/le ruote	4.8	75.00%
Id-Pass2	Stringere i denti/le ruote	4.8	83.33%
Lit-Pass1	Stringere i denti/le ruote	4.6	
Lit-Pass2	Stringere i denti/le ruote	3.5	
Id-Pass1	Subire uno scacco/uno scippo	2.7	8.33%
Id-Pass2	Subire uno scacco/uno scippo	5.3	16.67%
Lit-Pass1	Subire uno scacco/uno scippo	4.3	
Lit-Pass2	Subire uno scacco/uno scippo	4.4	
Id-Pass1	Tagliare la corda/la barba	4.2	25.00%
Id-Pass2	Tagliare la corda/la barba	4.7	83.33%
Lit-Pass1	Tagliare la corda/la barba	4.2	
Lit-Pass2	Tagliare la corda/la barba	2.5	
Id-Pass1	Tentare la sorte/un furto	5.2	16.67%
Id-Pass2	Tentare la sorte/un furto	4.3	25.00%
Lit-Pass1	Tentare la sorte/un furto	5.9	

Lit-Pass2	Tentare la sorte/un furto	3.9	
Id-Pass1	Tirare la corda/il freno	5	41.67%
Id-Pass2	Tirare la corda/il freno	4.9	83.33%
Lit-Pass1	Tirare la corda/il freno	5	
Lit-Pass2	Tirare la corda/il freno	2.3	
Id-Pass1	Trovare la chiave/del denaro	6	66.67%
Id-Pass2	Trovare la chiave/del denaro	4.4	0.00%
Lit-Pass1	Trovare la chiave/del denaro	5.2	
Lit-Pass2	Trovare la chiave/del denaro	3.7	
Id-Pass1	Urtare i nervi/il polso	4.8	8.33%
Id-Pass2	Urtare i nervi/il polso	5	58.33%
Lit-Pass1	Urtare i nervi/il polso	3.1	
Lit-Pass2	Urtare i nervi/il polso	2.6	
Id-Pass1	Vedere le stelle/la rapina	5.5	83.33%
Id-Pass2	Vedere le stelle/la rapina	6.1	100.00%
Lit-Pass1	Vedere le stelle/la rapina	5	
Lit-Pass2	Vedere le stelle/la rapina	3.1	
Id-Pass1	Vuotare il sacco/il pozzo	6	58.33%
Id-Pass2	Vuotare il sacco/il pozzo	2.7	100.00%
Lit-Pass1	Vuotare il sacco/il pozzo	3.1	
Lit-Pass2	Vuotare il sacco/il pozzo	5	

Table B.5: Average naturalness ratings and cloze probability ratings when the dialogue was being cut off right before the second content word of the idiom/literal phrase (w2) for the four experimental conditions of the 60 Italian verb-determiner-noun idioms used as items in the second experiment in Chapter 3. Of note, literal dialogues were just used in the naturalness survey. The eye-tracking experiment just made use of the idiomatic stimuli, for which cloze ratings were collected as well.

B.6 Experimental dialogues of experiment 2

Cond.	Item	Dialogue
Id-P1	Abbassare la cresta/lo stereo	A: Come mai i colleghi di Giorgio sono diventati finalmente meno arroganti? Uno loro progetto è andato in fumo e si sono demoralizzati? B: No, è da quando il capo li ha ripresi per la loro imprecisione nelle consegne che la cresta è stata abbassata, a quanto ho capito. A: 'How come Giorgio's colleagues finally became less arrogant? Did a project they made go up in smoke and did they become disheartened?' B: 'No, it is since the boss scolded them because they were inaccurate in their job that the crest was lowered, as far as I understood'.
Id-P2	Abbassare la cresta/lo stereo	A: Come mai i colleghi di Giorgio sono diventati finalmente meno arroganti? Uno loro progetto è andato in fumo e si sono demoralizzati? B: No, è da quando il capo li ha ripresi per la loro imprecisione nelle consegne che è stata abbassata la cresta, a quanto ho capito. A: 'How come Giorgio's colleagues finally became less arrogant? Did a project they made go up in smoke and did they become disheartened?' B: 'No, it is since the boss scolded them because they were inaccurate in their job that lit. was lowered the crest, as far as I understood'.
Lit-P1	Abbassare la cresta/lo stereo	A: Per quale motivo gli studenti hanno all'improvviso ridotto il volume della musica alla festa? Perché la serata era finita? B: No, era per ascoltare l'edizione straordinaria del telegiornale che lo stereo è stato abbassato e i presenti si sono ammutoliti. A: 'Why did the student suddenly turn down the music at the party? Was it because the party was over?' B: 'No, it is because they wanted to listen to the breaking news that the stereo was turned down and the bystanders became silent'.
Lit-P2	Abbassare la cresta/lo stereo	A: Per quale motivo gli studenti hanno all'improvviso ridotto il volume della musica alla festa? Perché la serata era finita? B: No, era per ascoltare l'edizione straordinaria del telegiornale che è stato abbassato lo stereo e i presenti si sono ammutoliti. A: 'Why did the student suddenly turn down the music at the party? Was it because the party was over?' B: 'No, it is because they wanted to listen to the breaking news that lit. was turned down the stereo and the bystanders became silent'.
Id-P1	Accusare il colpo/la banca	A: Come mai i familiari di Federica hanno avuto quel brutto momento di sconforto il mese scorso? Perché era rimasta senza lavoro? B: No, è quando lei ha iniziato ad avere problemi di tossicodipendenza che il colpo è stato accusato da tutti, a quanto ho capito. A: 'Why did Federica's relatives go through that rough patch last month? Was it because she remained unemployed?' B: 'No, it is when she became having drug addiction problems that the blow was suffered by everyone, as far as I got it'.
Id-P2	Accusare il colpo/la banca	A: Come mai i familiari di Federica hanno avuto quel brutto momento di sconforto il mese scorso? Perché era rimasta senza lavoro? B: No, è quando lei ha iniziato ad avere problemi di tossicodipendenza che è stato accusato il colpo da tutti, a quanto ho capito. A: 'Why did Federica's relatives go through that rough patch last month? Was it because she remained unemployed?' B: 'No, it is when she became having drug addiction problems that lit. was suffered the blow by everyone, as far as I got it'.
Lit-P1	Accusare il colpo/la banca	A: Di che cosa i paesani hanno incolpato la cassa di risparmio? Di aver rubato dei loro fondi? B: No, è per aver mentito sui tassi di interesse per i prestiti che la banca è stata accusata, avviando così un procedimento penale. A: 'What did the people in the village blame the savings bank of? Of stealing their funds?' B: 'No, it is because they lied about interest rates of loans that the bank was accused, starting hence a lawsuit.'
Lit-P2	Accusare il colpo/la banca	A: Di che cosa i paesani hanno incolpato la cassa di risparmio? Di aver rubato dei loro fondi? B: No, è per aver mentito sui tassi di interesse per i prestiti che è stata accusata la banca, avviando così un procedimento penale. A: 'What did the people in the village blame the savings bank of? Of stealing their funds?' B: 'No, it is because they lied about interest rates of loans that lit. was accused the bank, starting hence a lawsuit.'
Id-P1	Allungare il muso/la gita	A: Come mai i figli di Marco, che prima giocavano divertiti qui in spiaggia, ora sembrano così tristi? Hanno visto che verrà a piovere? B: No, è stato perché il papà ha detto a loro due che era il momento di andare a casa che il muso è stato allungato, a quanto ho visto. A: 'How come Marco's children, that were playing and having fun here on the beach, now look so sad? Did they see it is about to rain?' B: 'No, it is because their dad told them it was about time to go home that the snout was stretched, as far as I saw'.

Id-P2	Allungare il muso/la gita	A: Come mai i figli di Marco, che prima giocavano divertiti qui in spiaggia, ora sembrano così tristi? Hanno visto che verrà a piovere? B: No, è stato perché il papà ha detto a loro due che era il momento di andare a casa che è stato allungato il muso, a quanto ho visto. A: 'How come Marco's children, that were playing and having fun here on the beach, now look so sad? Did they see it is about to rain?' B: 'No, it is because their dad told them it was about time to go home that lit. was stretched the snout, as far as I saw'.
Lit-P1	Allungare il muso/la gita	A: Come mai la classe ha prenotato un itinerario più lungo di quanto originariamente previsto? Hanno deciso di visitare più posti? B: No, è perché il viaggio di ritorno sarà in treno che di fatto la gita è stata allungata di un giorno, in modo da ripartire con calma. A: 'How come the class booked a trip that was longer than expected? Did they decide to visit more places?' B: No, it is because the trip back will be on a train that actually the trip was extended for one day, in order not to leave in a rush'.
Lit-P2	Allungare il muso/la gita	A: Come mai la classe ha prenotato un itinerario più lungo di quanto originariamente previsto? Hanno deciso di visitare più posti? B: No, è perché il viaggio di ritorno sarà in treno che di fatto è stata allungata la gita di un giorno, in modo da ripartire con calma. A: 'How come the class booked a trip that was longer than expected? Did they decide to visit more places?' B: 'No, it is because the trip back will be on a train that actually lit. was extended the trip for one day, in order not to leave in a rush'.
Id-P1	Alzare la voce/il libro	A: Per quale motivo i condomini del nostro palazzo si sono arrabbiati con l'amministratore? Perché non vuole assumere un nuovo portiere? B: No, è stato contro l'inutile spesa per imbiancare la facciata del palazzo che la voce è stata alzata contro di lui, se ricordo bene. A: 'Why did residents in our block get so mad with the administrator? Because he does not want to hire a new doorman?' B: 'No it was against the useless expense for whitewashing the building facade that the voice was raised against him, if I remember well'.
Id-P2	Alzare la voce/il libro	A: Per quale motivo i condomini del nostro palazzo si sono arrabbiati con l'amministratore? Perché non vuole assumere un nuovo portiere? B: No, è stato contro l'inutile spesa per imbiancare la facciata del palazzo che è stata alzata la voce contro di lui, se ricordo bene. A: 'Why did residents in our block get so mad with the administrator? Because he does not want to hire a new doorman?' B: 'No it was against the useless expense for whitewashing the building facade that lit. was raised the voice against him, if I remember well'.
Lit-P1	Alzare la voce/il libro	A: Perché in chiesa hanno sollevato con un supporto il messale che tenevano sul leggio durante la funzione? Era scritto troppo piccolo? B: No, è stato più che altro per agevolare la lettura agli anziani durante la funzione che il libro è stato alzato con dei sostegni. A: 'Why did people in the church lift with a stand the missal they were keeping on the bookstand during the mass? Was it written too small?' B: 'No, it was mostly for make reading easier for old people during the mass that the book was lifted with some supports'.
Lit-P2	Alzare la voce/il libro	A: Perché in chiesa hanno sollevato con un supporto il messale che tenevano sul leggio durante la funzione? Era scritto troppo piccolo? B: No, è stato più che altro per agevolare la lettura agli anziani durante la funzione che è stato alzato il libro con dei sostegni. A: 'Why did people in the church lift with a stand the missal they were keeping on the bookstand during the mass? Was it written too small?' B: 'No, it was mostly for make reading easier for old people during the mass that lit. was lifted the book with some supports'.
Id-P1	Aprire gli occhi/uno studio	A: Com'è accaduto che l'amministrazione comunale si è accorta che il sindaco fosse corrotto? Sono arrivate delle denunce contro di lui? B: No, è quando hanno saputo dei 30 milioni spariti dal fondo del Comune che gli occhi sono stati aperti finalmente sul nostro sindaco. A: 'How did it happen that the city council realized the mayor is corrupted? Were charges pressed against him?' B: 'No, it is when they knew about the 30 millions disappeared from the town hall savings that the eyes were opened finally on our mayor'.
Id-P2	Aprire gli occhi/uno studio	A: Com'è accaduto che l'amministrazione comunale si è accorta che il sindaco fosse corrotto? Sono arrivate delle denunce contro di lui? B: No, è quando hanno saputo dei 30 milioni spariti dal fondo del Comune che sono stati aperti gli occhi finalmente sul nostro sindaco. A: 'How did it happen that the city council realized the mayor is corrupted? Were charges pressed against him?' B: 'No, it is when they knew about the 30 millions disappeared from the town hall savings that lit. were opened the eyes finally on our mayor'.

Lit-P1	Aprire gli occhi/uno studio	A: Dov'è che il gruppo di architetti di cui fa parte Nicola ha inaugurato una nuova sede? In centro città? B: No, in realtà è piuttosto in periferia che lo studio è stato aperto e ci domandiamo tutti il motivo di questa insolita decisione. A: 'Where did the architects group that Nicola belongs to opened new offices? Downtown?' B: 'No, actually it is pretty on the outskirts that the office was opened and we are all wondering about why they made this decision'.
Lit-P2	Aprire gli occhi/uno studio	A: Dov'è che il gruppo di architetti di cui fa parte Nicola ha inaugurato una nuova sede? In centro città? B: No, in realtà è piuttosto in periferia che è stato aperto lo studio e ci domandiamo tutti il motivo di questa insolita decisione. A: 'Where did the architects group that Nicola belongs to opened new offices? Downtown?' B: 'No, actually it is pretty on the outskirts that lit. was opened the office and we are all wondering about why they made this decision'.
Id-P1	Attaccare un bottone/la lampada	A: Come mai i genitori hanno fermato il professore fuori dall'assemblea? Per chiedergli dove sarebbe andata in gita la classe? B: No, era per informarsi su quando sarebbe andato in pensione che il bottone gli è stato attaccato, anche se non credo abbia gradito. A: 'Why did parents stop the professor outside the meeting? To ask him where the class would go on a school trip?' B: 'No, it is to know when he would retire that the button was attached to him, though I think he did not like it'.
Id-P2	Attaccare un bottone/la lampada	A: Come mai i genitori hanno fermato il professore fuori dall'assemblea? Per chiedergli dove sarebbe andata in gita la classe? B: No, era per informarsi su quando sarebbe andato in pensione che gli è stato attaccato il bottone, anche se lui non ha gradito. A: 'Why did parents stop the professor outside the meeting? To ask him where the class would go on a school trip?' B: 'No, it is to know when he would retire that lit. was attached the button to him, though I think he did not like it'.
Lit-P1	Attaccare un bottone/la lampada	A: Per quale motivo le guardie carcerarie hanno acceso la luce nella cella del boss? Per impedirgli di dormire? B: No, è per controllare costantemente i suoi movimenti nella cella che la lampada è stata attaccata, come ordinato dai piani superiori. A: 'Why did prison guards turn up the light in the boss' cell? To prevent him from sleeping?' B: 'No, it was to constantly check his moves in the cell that the lamp was plugged in, as ordered from the high places'.
Lit-P2	Attaccare un bottone/la lampada	A: Per quale motivo le guardie carcerarie hanno acceso la luce nella cella del boss? Per impedirgli di dormire? B: No, è per controllare costantemente i suoi movimenti nella cella che è stata attaccata la lampada, come ordinato dai piani superiori. A: 'Why did prison guards turn up the light in the boss' cell? To prevent him from sleeping?' B: 'No, it was to constantly check his moves in the cell that lit. was plugged in the lamp, as ordered from the high places'.
Id-P1	Avvelenare il fegato/il rivale	A: In che modo mi dicevi che gli amici di Mauro hanno finito per esasperarlo? Commentando il suo matrimonio? B: No, è con continue frecciate su una sua presunta raccomandazione al lavoro che il fegato gli è stato avvelenato, a quanto pare. A: 'How were you telling me that Mauro's friends ended up getting on his nerves? Making remarks about his marriage?' B: 'No, it is with repeated cutting remarks about a supposed backing on the job that the liver was poisoned to him, apparently'.
Id-P2	Avvelenare il fegato/il rivale	A: In che modo mi dicevi che gli amici di Mauro hanno finito per esasperarlo? Commentando il suo matrimonio? B: No, è con continue frecciate su una sua presunta raccomandazione al lavoro che gli è stato avvelenato il fegato, a quanto pare. A: 'How were you telling me that Mauro's friends ended up getting on his nerves? Making remarks about his marriage?' B: 'No, it is with repeated cutting remarks about a supposed backing on the job that lit. was poisoned the liver to him, apparently'.
Lit-P1	Avvelenare il fegato/il rivale	A: Come ha fatto il presidente in carica ad eliminare il suo concorrente alle passate elezioni, come si è scoperto? Con del cianuro? B: No, è con dell'arsenico versato dentro al cibo che il rivale è stato avvelenato, come si è in seguito scoperto nell'interrogatorio. A: 'How did the president in office manage to do away with his opponent at the last elections, as was discovered later? With cyanide?' B: 'No, it is with arsenic poured inside his food that the rival was poisoned, as was later found out in the interrogation'.
Lit-P2	Avvelenare il fegato/il rivale	A: Come ha fatto il presidente in carica ad eliminare il suo concorrente alle passate elezioni, come si è scoperto? Con del cianuro? B: No, è con dell'arsenico versato dentro al cibo che è stato avvelenato il rivale, come si è in seguito scoperto nell'interrogatorio. A: 'How did the president in office manage to do away with his opponent at the last elections, as was discovered later? With cyanide?' B: 'No, it is with arsenic poured inside his food that lit. was poisoned the rival, as was later found out in the interrogation'.

Id-P1	Battere la fiacca/lo stinco	A: Perché la classe di Luca ha trascorso la giornata senza lavorare? Tutti gli studenti erano andati alla manifestazione in piazza? B: No, è perché è arrivato il nuovo supplente incapace di gestire la classe che la fiacca è stata battuta tutto il pomeriggio. A: 'Why did Luca's class spend the entire day without working? Had all the students gone to the rally in the square?' B: 'No, it is because a new substitute teacher arrived who is incapable of managing the class that the weariness was beaten the whole afternoon'.
Id-P2	Battere la fiacca/lo stinco	A: Perché la classe di Luca ha trascorso la giornata senza lavorare? Tutti gli studenti erano andati alla manifestazione in piazza? B: No, è perché è arrivato il nuovo supplente incapace di gestire la classe che è stata battuta la fiacca tutto il pomeriggio. A: 'Why did Luca's class spend the entire day without working? Had all the students gone to the rally in the square?' B: 'No, it is because a new substitute teacher arrived who is incapable of managing the class that lit. was beaten the weariness the whole afternoon'.
Lit-P1	Battere la fiacca/lo stinco	A: In che modo il calciatore ha avuto l'infortunio? Durante la partita? B: No, è stato durante l'allenamento che è caduto e lo stinco è stato battuto con violenza, a quanto mi raccontavano i suoi medici. A: 'How did the football player have the injury? During the match?' B: 'No, it was during the training that he fell and the shin was hit violently, as his physicians were telling me'.
Lit-P2	Battere la fiacca/lo stinco	A: In che modo il calciatore ha avuto l'infortunio? Durante la partita? B: No, è stato durante l'allenamento che è caduto ed è stato battuto lo stinco con violenza, a quanto mi raccontavano i suoi medici. A: 'How did the football player have the injury? During the match?' B: 'No, it was during the training that he fell and lit. was hit the shin violently, as his physicians were telling me'.
Id-P1	Brucciare le tappe/la carne	A: Come mai Piero ha chiesto a Giulia di sposarla dopo solo due mesi che si frequentavano? Aveva fretta di accasarsi? B: No, è perché lei è rimasta incinta di lui dopo pochissimo tempo che si frequentavano che le tappe sono state bruciate, a quanto so. A: 'Why did Piero ask Giulia to marry him only after two months since they started dating? Was he eager to settle down?' B: 'No, it is because she got pregnant after a very short time since they started dating that the stops were burned down, from what I heard'.
Id-P2	Brucciare le tappe/la carne	A: Come mai Piero ha chiesto a Giulia di sposarla dopo solo due mesi che si frequentavano? Aveva fretta di accasarsi? B: No, è perché lei è rimasta incinta di lui dopo pochissimo tempo che si frequentavano che sono state bruciate le tappe, a quanto so. A: 'Why did Piero ask Giulia to marry him only after two months since they started dating? Was he eager to settle down?' B: 'No, it is because she got pregnant after a very short time since they started dating that lit. were burned down the stops, from what I heard'.
Lit-P1	Brucciare le tappe/la carne	A: Per quale motivo le costine che Niccolò e i suoi amici stavano grigliando si sono carbonizzate? Hanno sbagliato il tempo di cottura? B: No, è proprio perché se le sono dimenticate sulla griglia che la carne è stata bruciata e hanno quindi dovuto comprarne dell'altra. A: 'Why did the ribs that Niccolò and his friends were grilling become carbonized? Did they cook them for the wrong amount of time?' B: 'No, it is because they forgot them on the grill that the meat was burned and they had to buy some more'.
Lit-P2	Brucciare le tappe/la carne	A: Per quale motivo le costine che Niccolò e i suoi amici stavano grigliando si sono carbonizzate? Hanno sbagliato il tempo di cottura? B: No, è proprio perché se le sono dimenticate sulla griglia che è stata bruciata la carne e hanno quindi dovuto comprarne dell'altra. A: 'Why did the ribs that Niccolò and his friends were grilling become carbonized? Did they cook them for the wrong amount of time?' B: 'No, it is because they forgot them on the grill that the lit. was burned the meat and they had to buy some more'.
Id-P1	Chiudere il becco/l'uscio	A: Come si sono comportati i nipoti di Rachele a teatro ieri sera? Sono stati silenziosi? B: No, è stato solo dopo un duro rimprovero da parte sua che il becco è stato chiuso da tutti i ragazzi e la recita è potuta iniziare. A: 'How did Rachele's niece and nephew behave at the theatre yesterday evening? Were they silent?' B: 'No, it was only after a hard scolding from her that the beak was closed by everyone and the play could start'.

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Id-P2	Chiudere il becco/l'uscio	B: No, è stato solo dopo un duro rimprovero da parte sua che è stato chiuso il becco da tutti i ragazzi e la recita è potuta iniziare. A: 'How did Rachele's niece and nephew behave at the theatre yesterday evening? Were they silent?' B: 'No, it was only after a hard scolding from her that lit. was closed the beak by everyone and the play could start'.
Lit-P1	Chiudere il becco/l'uscio	A: Per quale motivo i professori hanno sbattuto con aria seccata la porta della sala riunioni? Stavano litigando fra di loro? B: No, è perché erano disturbati dalle grida nel corridoio che l'uscio è stato chiuso, in modo che la riunione potesse continuare. A: 'Why did professors slam the meeting room door with such an annoyed look? Were they fighting with each other?' B: 'No, it is because they were disturbed by people screaming in the corridor that the outside door was closed, so that the meeting could go on'.
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Id-P1	Contare le pecore/gli alunni	A: Come mai mi dicevi che a casa vostra avete trascorso la notte in bianco? Vostro figlio non stava bene? B: No, è perché eravamo molto preoccupati per il mutuo della nostra casa che le pecore sono state contate fino alle cinque di mattina. A: 'Why did you tell me that you all had a sleepless night in your family? Was your son feeling bad?' B: 'No, it is because we were very worried for house mortgage that the sheeps were counted until 5AM'.
Id-P2	Contare le pecore/gli alunni	A: Come mai mi dicevi che a casa vostra avete trascorso la notte in bianco? Vostro figlio non stava bene? B: No, è perché eravamo molto preoccupati per il mutuo della nostra casa che sono state contate le pecore fino alle cinque di mattina. A: 'Why did you tell me that you all had a sleepless night in your family? Was your son feeling bad?' B: 'No, it is because we were very worried for house mortgage that lit.were counted the sheeps until 5AM'.
Lit-P1	Contare le pecore/gli alunni	A: Com'è accaduto che un alunno rimanesse a terra quando la classe è partita in aereo? Non avevano fatto l'appello prima dell'imbarco? B: No, è solo all'ingresso dell'aeroporto che gli alunni sono stati contati, quindi nessuno si è poi accorto che l'alunno si era perso. A: 'How did it happen that a pupil was not boarded when the class went on a trip by plane? Didn't they call the register before boarding?' B: 'No, it is just at the airport entrance that the pupils were counted, so nobody realized that the pupil had got lost'.
Lit-P2	Contare le pecore/gli alunni	A: Com'è accaduto che un alunno rimanesse a terra quando la classe è partita in aereo? Non avevano fatto l'appello prima dell'imbarco? B: No, è solo all'ingresso dell'aeroporto che sono stati contati gli alunni, quindi nessuno si è poi accorto che l'alunno si era perso. A: 'How did it happen that a pupil was not boarded when the class went on a trip by plane? Didn't they call the register before boarding?' B: 'No, it is just at the airport entrance that lit. were counted the pupils, so nobody realized that the pupil had got lost'.
Id-P1	Coprire le spalle/il tavolo	A: Come sono riusciti i compagni di Anna a impedire che venisse interrogata? Convincendo il professore a spiegare? B: No, è stato offrendosi loro per l'interrogazione che le spalle le sono state coperte, permettendole di studiare per la volta dopo. A: 'How did Anna's classmates manage to prevent her from having the oral exam? Convincing the teacher to give a lesson?' B: 'No, it is offering themselves for the exam that the shoulders were covered to her, allowing her to study for the next time'.
Id-P2	Coprire le spalle/il tavolo	A: Come sono riusciti i compagni di Anna a impedire che venisse interrogata? Convincendo il professore a spiegare? B: No, è stato offrendosi loro per l'interrogazione che le sono state coperte le spalle, permettendole di studiare per la volta dopo. A: 'How did Anna's classmates manage to prevent her from having the oral exam? Convincing the teacher to give a lesson?' B: 'No, it is offering themselves for the exam that lit. were covered the shoulders to her, allowing her to study for the next time'.
Lit-P1	Coprire le spalle/il tavolo	A: A quale scopo Giulia e Beatrice hanno messo dei fogli di giornale sulla scrivania della loro stanza? Per dipingerci sopra? B: No, è perché stanno per imbiancare la stanza che il tavolo è stato coperto, in modo che le gocce di vernice non lo sporcassero. A: 'What did Giulia and Beatrice put some newspaper sheet on their bedroom desk for? For painting over them?' B: 'No, it is because they are about to whitewash the room that the table was covered, so that paint stains would not get it dirty'.

Lit-P2	Coprire le spalle/il tavolo	A: A quale scopo Giulia e Beatrice hanno messo dei fogli di giornale sulla scrivania della loro stanza? Per dipingerci sopra? B: No, è perché stanno per imbiancare la stanza che è stato coperto il tavolo, in modo che le gocce di vernice non lo sporcassero. A: 'What did Giulia and Beatrice put some newspaper sheet on their bedroom desk for? For painting over them?' B: 'No, it is because they are about to whitewash the room that lit. was covered the table, so that paint stains would not get it dirty'.
Id-P1	Cucire le labbra/la manica	A: In che modo la ditta ha impedito a Lucia di divulgare i dossier sull'inquinamento delle acque? Minacciando la sua famiglia? B: No, è stato minacciando di licenziarla e di screditarla sui giornali locali che la bocca le è stata cucita, secondo le ricostruzioni. A: 'How did the company prevent Lucia from disclosing the dossier on water pollution? By threatening her family?' B: 'No it is by threatening her to fire her and discredit her on the newspapers that the mouth was sewn to her, according to the reconstruction'.
Id-P2	Cucire le labbra/la manica	A: In che modo la ditta ha impedito a Lucia di divulgare i dossier sull'inquinamento delle acque? Minacciando la sua famiglia? B: No, è stato minacciando di licenziarla e di screditarla sui giornali locali che le è stata cucita la bocca, secondo le ricostruzioni. A: 'How did the company prevent Lucia from disclosing the dossier on water pollution? By threatening her family?' B: 'No it is by threatening her to fire her and discredit her on the newspapers that lit. was sewn the mouth to her, according to the reconstruction'.
Lit-P1	Cucire le labbra/la manica	A: Come sono riuscite Lia e Marta a sistemare la manica della loro giacca strappata? Da sole? B: No, è stato solo grazie all'aiuto della madre che la manica è stata cucita e Lia ha potuto indossare la giacca per la sua comunione. A: 'How did Lia and Marta fix the sleeve of their ripped jacket? By themselves?' B: 'No, it is just with the help of their mother that the sleeve was sewn and Lia could wear the jacket for her holy communion'.
Lit-P2	Cucire le labbra/la manica	A: Come sono riuscite Lia e Marta a sistemare la manica della loro giacca strappata? Da sole? B: No, è stato solo grazie all'aiuto della madre che è stata cucita la manica e Lia ha potuto indossare la giacca per la sua comunione. A: 'How did Lia and Marta fix the sleeve of their ripped jacket? By themselves?' B: 'No, it is just with the help of their mother that lit. was sewn the sleeve and Lia could wear the jacket for her holy communion'.
Id-P1	Dare i numeri/un titolo	A: Il litigio scoppiato nella vostra famiglia l'altra sera a cosa è stato dovuto? Alla bocciatura di tuo fratello alla maturità? B: No, è perché mia sorella ha annunciato ai miei che divorzierà che i numeri sono stati dati, come hanno sentito anche i nostri vicini. A: 'What was the fight that broke out in your family due to? Was it due to your brother failing the year?' B: 'No, it is because my sister announced to my parents that she will divorce that the numbers were given, as also our neighbors heard'.
Id-P2	Dare i numeri/un titolo	A: Il litigio scoppiato nella vostra famiglia l'altra sera a cosa è stato dovuto? Alla bocciatura di tuo fratello alla maturità? B: No, è perché mia sorella ha annunciato ai miei che divorzierà che sono stati dati i numeri, come hanno sentito anche i nostri vicini. A: 'What was the fight that broke out in your family due to? Was it due to your brother failing the year?' B: 'No, it is because my sister announced to my parents that she will divorce that lit. were given the numbers, as also our neighbors heard'.
Lit-P1	Dare i numeri/un titolo	A: È stato facile per gli autori coinvolti capire come intitolare il volume che raccoglieva i loro racconti? B: No, è stato solo dopo interminabili discussioni che un titolo è stato dato alla raccolta e finalmente hanno potuto pubblicarla. A: 'Was it easy for the authors that were involved to understand how to name the volume that collected their tales?' B: 'No, it was only after infinite discussions that a title was given to the collection and they could eventually publish it'.
Lit-P2	Dare i numeri/un titolo	A: È stato facile per gli autori coinvolti capire come intitolare il volume che raccoglieva i loro racconti? B: No, è stato solo dopo interminabili discussioni che è stato dato un titolo alla raccolta e finalmente hanno potuto pubblicarla. A: 'Was it easy for the authors that were involved to understand how to name the volume that collected their tales?' B: 'No, it was only after infinite discussions that lit. was given a title to the collection and they could eventually publish it'.

Id-P1	Fare una croce/una piega	A: Come mai la vostra compagnia di amici non ha più voluto saperne di andare al ristorante di Giovanni? I prezzi sono troppo alti? B: No, è stato per via di un'intossicazione alimentare avuta da tutti l'ultima volta che la croce è stata fatta su quel ristorante. A: 'How come your group of friends never wanted to go to Giovanni's restaurant anymore? Are prices too high?' B: 'No, it was because of a food poisoning experienced by everyone last time that the cross was made on that restaurant'.
Id-P2	Fare una croce/una piega	A: Come mai la vostra compagnia di amici non ha più voluto saperne di andare al ristorante di Giovanni? I prezzi sono troppo alti? B: No, è stato per via di un'intossicazione alimentare avuta da tutti l'ultima volta che è stata fatta la croce su quel ristorante. A: 'How come your group of friends never wanted to go to Giovanni's restaurant anymore? Are prices too high?' B: 'No, it was because of a food poisoning experienced by everyone last time that lit. was made the cross on that restaurant'.
Lit-P1	Fare una croce/una piega	A: Come mai la prima pagina della tesi di Gabriella è tutta stropicciata? Le è caduta per sbaglio? B: No, è per via di un malfunzionamento della pressa della copisteria che le pieghe sono state fatte, ma ormai era tardi per ristampare. A: 'Why is the first page of Gabriella's thesis all creased? Did it fall by mistake?' B: 'No, it is because of a malfunctioning of the copy shop's press that the folds were made, but by then it was too late to print it again'.
Lit-P2	Fare una croce/una piega	A: Come mai la prima pagina della tesi di Gabriella è tutta stropicciata? Le è caduta per sbaglio? B: No, è per via di un malfunzionamento della pressa della copisteria che sono state fatte le pieghe, ma ormai era tardi per ristampare. A: 'Why is the first page of Gabriella's thesis all creased? Did it fall by mistake?' B: 'No, it is because of a malfunctioning of the copy shop's press that lit. were made the folds, but by then it was too late to print it again'.
Id-P1	Ferire il cuore/un piede	A: In che modo gli amici di Gianluca avrebbero offeso i suoi sentimenti? Quando gli hanno detto che è una persona poco sincera? B: No, è stato piuttosto quando hanno detto che non era un buon genitore che il cuore gli è stato ferito, come mi hanno raccontato. A: 'How did Gianluca's friend reportedly hurt his feelings? When they told him he is not a very sincere person?' B: 'No, it was rather when they told he is not a good parent that the heart was hurt to him, as they told me'.
Id-P2	Ferire il cuore/un piede	A: In che modo gli amici di Gianluca avrebbero offeso i suoi sentimenti? Quando gli hanno detto che è una persona poco sincera? B: No, è stato piuttosto quando hanno detto che non era un buon genitore che gli è stato ferito il cuore, come mi hanno raccontato. A: 'How did Gianluca's friend reportedly hurt his feelings? When they told him he is not a very sincere person?' B: 'No, it was rather when they told he is not a good parent that lit. was hurt the heart to him, as they told me'.
Lit-P1	Ferire il cuore/un piede	A: Quando è accaduto che Francesco si rompesse il malleolo? Durante gli allenamenti per il match? B: No, è stato durante la finale del torneo che il piede gli è stato ferito, quando un avversario rincorrendolo gli ha fatto lo sgambetto. A: 'When did Francesco break his malleolus? During his training for the match?' B: 'No, it was during the final match of the tournament that the foot was hurt to him, when an opponent that was chasing him tripped him up'.
Lit-P2	Ferire il cuore/un piede	A: Quando è accaduto che Francesco si rompesse il malleolo? Durante gli allenamenti per il match? B: No, è stato durante la finale del torneo che gli è stato ferito il piede, quando un avversario rincorrendolo gli ha fatto lo sgambetto. A: 'When did Francesco break his malleolus? During his training for the match?' B: 'No, it was during the final match of the tournament that lit. was hurt the foot to his, when an opponent that was chasing him tripped him up'.
Id-P1	Ficcare il naso/dei pali	A: Come mai le segretarie hanno rovistato nella scrivania del capo mentre lui era assente? Cercavano di capire se avesse un'amante? B: No, è stato per controllare se avesse degli affari loschi in corso che il naso è stato ficcato nei suoi documenti, a quanto suppongo. A: 'How come the secretaries rummaged through the boss' desk while he was away? Were they trying to figure out if he has a lover?' B: 'No, it was to check whether he had shenanigans underway that the nose was stuck into his files, as I suppose'.

Id-P2	Ficcare il naso/dei pali	A: Come mai le segretarie hanno rovistato nella scrivania del capo mentre lui era assente? Cercavano di capire se avesse un'amante? B: No, è stato per controllare se avesse degli affari loschi in corso che è stato ficcato il naso nei suoi documenti, suppongo. A: 'How come the secretaries rummaged through the boss' desk while he was away? Were they trying to figure out if he has a lover?' B: 'No, it was to check whether he had shenanigans underway that lit. was stuck the nose into his files, as I suppose'.
Lit-P1	Ficcare il naso/dei pali	A: Come mai gli organizzatori della festa hanno piantato quei piloni in giardino? Per costruirci un gazebo?' B: No, in realtà è stato per tendere una rete per giocare a pallavolo che i pali sono stati ficcati nel terreno, a quanto mi spiegavano. A: 'How come the party organizers planted those pillars in the garden? To build a gazebo there?' B: 'No, actually it was to stretch a net to play volleyball that the poles were stuck into the ground, from what I heard'
Lit-P2	Ficcare il naso/dei pali	A: Come mai gli organizzatori della festa hanno piantato quei piloni in giardino? Per costruirci un gazebo?' B: No, in realtà è stato per tendere una rete per giocare a pallavolo che sono stati ficcati i pali nel terreno, a quanto mi spiegavano. A: 'How come the party organizers planted those pillars in the garden? To build a gazebo there?' B: 'No, actually it was to stretch a net to play volleyball that lit. were stuck the poles into the ground, from what I heard'
Id-P1	Frenare la lingua/la strage	A: Cosa hanno detto le amiche di Valeria sulla sua nuova orrenda pettinatura? Si sono trattenute dal criticarla? B: No, è stato solo con un'occhiataccia di Paola che la lingua è stata frenata in tempo da tutte le altre, evitando commenti spiacevoli. A: 'What did Valeria's friends say about her hideous hair? Did they restrain themselves from criticizing it?' B: 'No, it was just with a furious glance from Paola that the tongue was held just in time by everyone, thus avoiding unpleasant remarks'.
Id-P2	Frenare la lingua/la strage	A: Cosa hanno detto le amiche di Valeria sulla sua nuova orrenda pettinatura? Si sono trattenute dal criticarla? B: No, è stato solo con un'occhiataccia di Paola che è stata frenata la lingua in tempo da tutte le altre, evitando commenti spiacevoli. A: 'What did Valeria's friends say about her hideous hair? Did they restrain themselves from criticizing it?' B: 'No, it was just with a furious glance from Paola that lit. was held the tongue just in time by everyone, thus avoiding unpleasant remarks'.
Lit-P1	Frenare la lingua/la strage	A: Con quale tattica la squadra di polizia ha impedito che il serial killer uccidesse gli ostaggi? Uccidendolo con dei cecchini? B: No, è stato semplicemente parlandoci e convincendolo a desistere che la strage è stata fermata, con sollievo e commozione di tutti. A: 'Which strategy did the police use to prevent the serial killer from killing the hostages? Did they kill him with snipers?' B: 'No, it was just talking to him and convincing him to give up that the massacre was contained, with collective relief and emotion'.
Lit-P2	Frenare la lingua/la strage	A: Con quale tattica la squadra di polizia ha impedito che il serial killer uccidesse gli ostaggi? Uccidendolo con dei cecchini? B: No, è stato semplicemente parlandoci e convincendolo a desistere che è stata fermata la strage, con sollievo e commozione di tutti. A: 'Which strategy did the police use to prevent the serial killer from killing the hostages? Did they kill him with snipers?' B: 'No, it was just talking to him and convincing him to give up that lit. was contained the massacre, with collective relief and emotion'.
Id-P1	Gettare la spugna/il fucile	A: Come hanno reagito i genitori di Alessia quando lei ha comunicato che non voleva proseguire l'università? Si sono arresi subito? B: No, è stato solo dopo lunghi mesi di litigi e discussioni che la spugna è stata gettata e hanno smesso di convincerla, mi dicevano. A: 'How did Alessia's parents react when she told them she did not want to go on with university? Did they give up immediately?' B: 'No, it was only after longht months of fights and discussions that the sponge was thrown away and they stopped convincing her, from what I heard'.
Id-P2	Gettare la spugna/il fucile	A: Come hanno reagito i genitori di Alessia quando lei ha comunicato che non voleva proseguire l'università? Si sono arresi subito? B: No, è stato solo dopo lunghi mesi di litigi e discussioni che è stata gettata la spugna e hanno smesso di convincerla, mi dicevano. A: 'How did Alessia's parents react when she told them she did not want to go on with university? Did they give up immediately?' B: 'No, it was only after longht months of fights and discussions that lit. was thrown away the sponge and they stopped convincing her, from what I heard'.

Lit-P1	Gettare la spugna/il fucile	A: I criminali che stavano per uccidere il presidente della banca si sono arresi subito alla polizia? O c'è voluto molto? B: No, è stato solo dopo pochi minuti di dialogo coi poliziotti che i fucili sono stati gettati e la polizia ha liberato gli ostaggi. A: 'Did the criminals that were about to kill the bank president surrend right away to the police? Did it take long instead?' B: 'No, it was just after a few minutes of dialogue with policemen that the guns were dropped and the policed freed the hostages'.
Lit-P2	Gettare la spugna/il fucile	A: I criminali che stavano per uccidere il presidente della banca si sono arresi subito alla polizia? O c'è voluto molto? B: No, è stato solo dopo pochi minuti di dialogo coi poliziotti che sono stati gettati i fucili e la polizia ha liberato gli ostaggi. A: 'Did the criminals that were about to kill the bank president surrend right away to the police? Did it take long instead?' B: 'No, it was just after a few minutes of dialogue with policemen that lit. were dropped the guns and the policed freed the hostages'.
Id-P1	Imparare la lezione/una poesia	A: In che modo i residenti hanno finalmente capito di dover differenziare i rifiuti? Con una campagna informativa del Comune? B: No, è stato solo dopo che il Comune ha introdotto delle multe per chi non lo faceva che la lezione è stata imparata, a quanto pare. A: 'How did the residents finally understand they had to collect waste separately? With an informative campaign from the city council?' B: 'No, it was just only after the city council introduced fees for those who were not doing it that the lesson was learnt, apparently'.
Id-P2	Imparare la lezione/una poesia	A: In che modo i residenti hanno finalmente capito di dover differenziare i rifiuti? Con una campagna informativa del Comune? B: No, è stato solo dopo che il Comune ha introdotto delle multe per chi non lo faceva che è stata imparata la lezione, a quanto pare. A: 'How did the residents finally understand they had to collect waste separately? With an informative campaign from the city council?' B: 'No, it was just only after the city council introduced fees for those who were not doing it that lit. was learnt the lesson, apparently'.
Lit-P1	Imparare la lezione/una poesia	A: Quanto hanno impiegato i bambini ad apprendere la filastrocca per la recita di Natale? Tanto tempo? B: No, è in giusto poche ore che la poesia è stata imparata alla perfezione, con enorme soddisfazione della maestra e dei genitori. A: 'How long did it take to pupils to learn the nursery rhyme for the Christmas show? A while?' B: 'No, it is just in a few hours that the poem was learnt perfectly, with great satisfaction both from the teacher and the classmates'.
Lit-P2	Imparare la lezione/una poesia	A: Quanto hanno impiegato i bambini ad apprendere la filastrocca per la recita di Natale? Tanto tempo? B: No, è in giusto poche ore che è stata imparata la poesia alla perfezione, con enorme soddisfazione della maestra e dei genitori. A: 'How long did it take to pupils to learn the nursery rhyme for the Christmas show? A while?' B: 'No, it is just in a few hours that lit. was learnt the poem perfectly, with great satisfaction both from the teacher and the classmates'.
Id-P1	Indorare la pillola/cornice	A: Com'è riuscita la direzione a rendere positivo il pensionamento per Sara? Dicendole che avrebbe avuto più tempo per la famiglia? B: No, è stato promettendole un contratto di collaborazione da esterna che la pillola le è stata indorata, o almeno così racconta lei. A: 'How did the directorate manage to make retirement look positive for Sara? Telling her she would have more time for her family?' B: 'No, it is promising her an external collaboration contract that the pill was gilded to her, or at least this is what she tells'.
Id-P2	Indorare la pillola/cornice	A: Com'è riuscita la direzione a rendere positivo il pensionamento per Sara? Dicendole che avrebbe avuto più tempo per la famiglia? B: No, è stato promettendole un contratto di collaborazione da esterna che le è stata indorata la pillola, o almeno così racconta lei. A: 'How did the directorate manage to make retirement look positive for Sara? Telling her she would have more time for her family?' B: 'No, it is promising her an external collaboration contract that lit. was gilded the pill to her, or at least this is what she tells'.
Lit-P1	Indorare la pillola/cornice	A: Per quale motivo la direzione del museo ha fatto restaurare quel quadro? Per una nuova apertura del museo? B: No, è in occasione del centenario del pittore che l'ha realizzato che la cornice è stata indorata, suscitando diverse perplessità. A: 'Why did the museum direction have that frame restored? Was it for a new opening of the museum?' B: 'No, it is on the occasion of the centennial of the painter who made it that the frame was gilded, causing a lot of perplexities'.
Lit-P2	Indorare la pillola/cornice	A: Per quale motivo la direzione del museo ha fatto restaurare quel quadro? Per una nuova apertura del museo? B: No, è in occasione del centenario del pittore che l'ha realizzato che è stata indorata la cornice, suscitando diverse perplessità. A: 'Why did the museum direction have that frame restored? Was it for a new opening of the museum?' B: 'No, it is on the occasion of the centennial of the painter who made it that lit. was gilded the frame, causing a lot of perplexities'.

Id-P1	Ingoiare il rospo/la zuppa	A: Come sono riusciti i genitori di Daniela ad accettare la sua morte? Grazie al sostegno degli amici? B: No, è stato solo grazie ad un lungo periodo di terapia che finalmente il rospo è stato ingoiato, come era da aspettarsi d'altronde. A: 'How did Daniela's parents manage to accept her death? Thanks to the support from their friends?' B: 'No, it is just thanks to a long period of therapy that finally the toad was swallowed, quite predictably after all'.
Id-P2	Ingoiare il rospo/la zuppa	A: Come sono riusciti i genitori di Daniela ad accettare la sua morte? Grazie al sostegno degli amici? B: No, è stato solo grazie ad un lungo periodo di terapia che finalmente è stato ingoiato il rospo, come era da aspettarsi d'altronde. A: 'How did Daniela's parents manage to accept her death? Thanks to the support from their friends?' B: 'No, it is just thanks to a long period of therapy that finally lit. was swallowed the toad, quite predictably after all'.
Lit-P1	Ingoiare il rospo/la zuppa	A: Come è sembrato il minestrone cucinato da Giorgio ai suoi ospiti? È piaciuto? B: No, è solo accompagnandoci molto pane che la zuppa è stata ingoiata, poiché Giorgio aveva usato le spezie in quantità sbagliate. A: 'How did the vegetable soup cooked by Giorgio taste to his guests? Did they like it?' B: 'No, it is just eating a lot of bread with it that the soup was swallowed, since Giorgio has used spices in the wrong quantity'.
Lit-P2	Ingoiare il rospo/la zuppa	A: Come è sembrato il minestrone cucinato da Giorgio ai suoi ospiti? È piaciuto? B: No, è solo accompagnandoci molto pane che è stata ingoiata la zuppa, poiché Giorgio aveva usato le spezie in quantità sbagliate. A: 'How did the vegetable soup cooked by Giorgio taste to his guests? Did they like it?' B: 'No, it is just eating a lot of bread with it that lit. was swallowed the soup, since Giorgio has used spices in the wrong quantity'.
Id-P1	Invertire la rotta/la marcia	A: Come mai la società di Gianpaolo ha smesso di produrre film e ora gira video musicali? Erano stufo e desideravano un cambiamento? B: No, è stato più che altro perché le loro vendite fino ad allora non erano state buone che la rotta è stata invertita, a quanto so. A: 'Why did Gianpaolo's company stop producing movies and is now shooting music videos? Were they bored and eager to change?' B: 'No, it was most of all because their sales so far had not been good that the direction was reversed, as far as I know'.
Id-P2	Invertire la rotta/la marcia	A: Come mai la società di Gianpaolo ha smesso di produrre film e ora gira video musicali? Erano stufo e desideravano un cambiamento? B: No, è stato più che altro perché le loro vendite fino ad allora non erano state buone che è stata invertita la rotta, a quanto so. A: 'Why did Gianpaolo's company stop producing movies and is now shooting music videos? Were they bored and eager to change?' B: 'No, it was most of all because their sales so far had not been good that lit. was reversed the direction, as far as I know'.
Lit-P1	Invertire la rotta/la marcia	A: Come mai all'improvviso Maria ha iniziato ad andare in retromarcia? Aveva inserito la marcia sbagliata? B: No, è stato per evitare di schiantarsi contro un tir di un uomo ubriaco che la marcia è stata invertita proprio all'ultimo minuto. 'A: Why did Maria suddenly start reversing? Had she shifted into the wrong gear?' B: 'No, it was to avoid crashing into a drunk man's truck that the direction was reversed at the very last moment'.
Lit-P2	Invertire la rotta/la marcia	A: Come mai all'improvviso Maria ha iniziato ad andare in retromarcia? Aveva inserito la marcia sbagliata? B: No, è stato per evitare di schiantarsi contro un tir di un uomo ubriaco che è stata invertita la marcia proprio all'ultimo minuto. A: 'Why did Maria suddenly start reversing? Had she shifted into the wrong gear?' B: 'No, it was to avoid crashing into a drunk man's truck that lit. was reversed the direction at the very last moment'.
Id-P1	Lasciare il segno/la spesa	A: Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi? B: No, è stato con il concerto per due pianoforti che il segno è stato lasciato nel pubblico, a giudicare dalle reazioni del pubblico. A: 'Which of the pieces that were played yesterday night at the concert impressed the audience the most, in your opinion? The string quartet?' B: 'No, it was with the two piano concert that the mark was left in the audience, judging from the reaction of the public'.

Id-P2	Lasciare il segno/la spesa	<p>A: Quale dei brani suonati all'esibizione di ieri sera ha impressionato di più la platea secondo te? Il quartetto di archi?</p> <p>B: No, è stato con il concerto per due pianoforti che è stato lasciato il segno nel pubblico, a giudicare dalle reazioni del pubblico.</p> <p>A: 'Which of the pieces that were played yesterday night at the concert impressed the audience the most, in your opinion? The string quartet?'</p> <p>B: 'No, it was with the two piano concert that lit. was left the mark in the audience, judging from the reaction of the public'.</p>
Lit-P1	Lasciare il segno/la spesa	<p>A: Dove hanno dimenticato Giulia e Andrea i sacchetti con le cose che avevano comprato al supermercato? Nel loro bagagliaio?</p> <p>B: No, è addirittura sul nastro della cassa che la spesa è stata lasciata, perché erano distratti ed impegnati in un violento litigio.</p> <p>A: 'Where did Giulia and Andrea forget the bags with the groceries they had bought at the supermarket? In the trunk?'</p> <p>B: 'No it is on the check-out counter that the groceries were left, because they were both absent-minded and engaged in a violent fight'.</p>
Lit-P2	Lasciare il segno/la spesa	<p>A: Dove hanno dimenticato Giulia e Andrea i sacchetti con le cose che avevano comprato al supermercato? Nel loro bagagliaio?</p> <p>B: No, è addirittura sul nastro della cassa che è stata lasciata la spesa, perché erano distratti ed impegnati in un violento litigio.</p> <p>A: 'Where did Giulia and Andrea forget the bags with the groceries they had bought at the supermarket? In the trunk?'</p> <p>B: 'No it is on the check-out counter that lit. were left the groceries, because they were both absent-minded and engaged in a violent fight'.</p>
Id-P1	Legare le mani/una rete	<p>A: Com'è riuscita la cosca mafiosa ad impedire a Carlo di denunciarli? Dicendogli che gli avrebbero rovinato la carriera?</p> <p>B: No, è stato minacciandolo di uccidere la sua famiglia che le mani gli sono state legate, come spesso avviene in casi come questo.</p> <p>A: 'How did the mafia gang manage to prevent Paolo from suing them? By telling him they would have spoiled his career?'</p> <p>B: 'No, it is by threatening him to kill his family that the hands were tied to him, as often happens in similar cases'.</p>
Id-P2	Legare le mani/una rete	<p>A: Com'è riuscita la cosca mafiosa ad impedire a Carlo di denunciarli? Dicendogli che gli avrebbero rovinato la carriera?</p> <p>B: No, è stato minacciandolo di uccidere la sua famiglia che gli sono state legate le mani, come spesso avviene in casi come questo.</p> <p>A: 'How did the mafia gang manage to prevent Paolo from suing them? By telling him they would have spoiled his career?'</p> <p>B: 'No, it is by threatening him to kill his family that lit. were tied the hands to him, as often happens in similar cases'.</p>
Lit-P1	Legare le mani/una rete	<p>A: Che cosa hanno usato i ragazzi nel cortile per annodare la rete per la loro partita di pallavolo? Un palo della luce?</p> <p>B: No, è ad un albero del cortile che la rete è stata legata, perché non possedevano degli altri supporti più consoni per fissarla.</p> <p>A: 'What did boys in the courtyard use to tie the net for their volleyball match? A lamppost?'</p> <p>B: 'No, it is to a tree in the courtyard that the net was tied, because they did not have other more fitting supports to fix it'.</p>
Lit-P2	Legare le mani/una rete	<p>A: Che cosa hanno usato i ragazzi nel cortile per annodare la rete per la loro partita di pallavolo? Un palo della luce?</p> <p>B: No, è ad un albero del cortile che è stata legata la rete, perché non possedevano degli altri supporti più consoni per fissarla.</p> <p>A: 'What did boys in the courtyard use to tie the net for their volleyball match? A lamppost?'</p> <p>B: 'No, it is to a tree in the courtyard that lit. was tied the net, because they did not have other more fitting supports to fix it'.</p>
Id-P1	Lustrare le scarpe/i mobili	<p>A: Come mai i tuoi colleghi hanno adulato il vostro capo così a lungo? Perché lo stimano?</p> <p>B: No, è nella speranza di ottenere prima o poi una promozione da lui che le scarpe gli sono state lustrate, ma con scarsi risultati.</p> <p>A: 'How come your colleagues flattered your boss for so long? Do they think highly of him?'</p> <p>B: 'No, it is because they hope to get sooner or later a promotion from him that the shoes were shined to him, but with poor results'.</p>
Id-P2	Lustrare le scarpe/i mobili	<p>A: Come mai i tuoi colleghi hanno adulato il vostro capo così a lungo? Perché lo stimano?</p> <p>B: No, è nella speranza di ottenere prima o poi una promozione da lui che gli sono state lustrate le scarpe, ma con scarsi risultati.</p> <p>A: 'How come your colleagues flattered your boss for so long? Do they think highly of him?'</p> <p>B: 'No, it is because they hope to get sooner or later a promotion from him that lit. were shined the shoes to him, but with poor results'.</p>

Lit-P1	Lustrare le scarpe/i mobili	A: Per quale occasione la proprietaria dell'albergo ha ordinato di pulire tutto l'arredamento? Erano in arrivo degli ospiti importanti? B: No, è stato per l'arrivo di un potenziale acquirente che i mobili sono stati lustrati, così da rendere più presentabile la struttura. A: 'For which occasion did the hotel owner order to clean all the furnishings? Were important guests arriving?' B: 'No, it was for the arrival of a potential buyer that the furniture was shined, so as to make the whole structure presentable'.
Lit-P2	Lustrare le scarpe/i mobili	A: Per quale occasione la proprietaria dell'albergo ha ordinato di pulire tutto l'arredamento? Erano in arrivo degli ospiti importanti? B: No, è stato per l'arrivo di un potenziale acquirente che sono stati lustrati i mobili, così da rendere più presentabile la struttura. A: 'For which occasion did the hotel owner order to clean all the furnishings? Were important guests arriving?' B: 'No, it was for the arrival of a potential buyer that lit. was shined the furniture, so as to make the whole structure presentable'.
Id-P1	Mancare il bersaglio/la votazione	A: Per quale motivo la casa di Giorgio non è riuscita a produrre un film di successo per questo Natale? Perché la trama era noiosa? B: No, è stato a causa della scarsissima promozione del film che il bersaglio è stato mancato, con un esito disastroso al botteghino. A: 'Why did not Giorgio's company manage to produce a successful movie this Christmas? Was the plot boring?' B: 'No, it was because of the very scarce promotion of the movie that the target was missed, with a disastrous outcome at the box office'.
Id-P2	Mancare il bersaglio/la votazione	A: Per quale motivo la casa di Giorgio non è riuscita a produrre un film di successo per questo Natale? Perché la trama era noiosa? B: No, è stato a causa della scarsissima promozione del film che è stato mancato il bersaglio, con un esito disastroso al botteghino. A: 'Why did not Giorgio's company manage to produce a successful movie this Christmas? Was the plot boring?' B: 'No, it was because of the very scarce promotion of the movie that lit. was missed the target, with a disastrous outcome at the box office'.
Lit-P1	Mancare il bersaglio/la votazione	A: Perché alcuni dei parlamentari non erano presenti in aula quanto è stato votato il decreto legge? Erano a qualche manifestazione? B: No, è stato perché stavano scioperando per protesta che la votazione è stata mancata, con risentimento dei parlamentari presenti. A: 'Why were not some parliamentarians present in the chamber when the law decree was signed? Were they at some rally?' B: 'No, it is because they were on a protest strike that the voting was missed, with an ensuing resentment of those who were present'.
Lit-P2	Mancare il bersaglio/la votazione	A: Perché alcuni dei parlamentari non erano presenti in aula quanto è stato votato il decreto legge? Erano a qualche manifestazione? B: No, è stato perché stavano scioperando per protesta che è stata mancata la votazione, con risentimento dei parlamentari presenti. A: 'Why were not some parliamentarians present in the chamber when the law decree was signed? Were they at some rally?' B: 'No, it is because they were on a protest strike that lit. was missed the voting, with an ensuing resentment of those who were present'.
Id-P1	Mangiare la foglia/un panino	A: Come hanno capito gli investigatori che il Presidente stesso stava complottando contro lo Stato? Notavano dei movimenti sospetti? B: No, è stato grazie alla soffiata di uno dei suoi collaboratori più intimi che la foglia è stata mangiata, stando alle ricostruzioni. A: 'How did detectives understand that the President himself was conspiring against the state? Did they notice suspected moves?' B: 'No, it was thanks to the whistleblowing by one of his closest collaborators that the leaf was eaten, according to the reconstructions'.
Id-P2	Mangiare la foglia/un panino	A: Come hanno capito gli investigatori che il Presidente stesso stava complottando contro lo Stato? Notavano dei movimenti sospetti? B: No, è stato grazie alla soffiata di uno dei suoi collaboratori più intimi che è stata mangiata la foglia, stando alle ricostruzioni. A: 'How did detectives understand that the President himself was conspiring against the state? Did they notice suspected moves?' B: 'No, it was thanks to the whistleblowing by one of his closest collaborators that lit. was eaten the leaf, according to the reconstructions'.
Lit-P1	Mangiare la foglia/un panino	A: Come mai i partecipanti alla visita hanno preferito consumare dei panini anziché fermarsi al ristorante? Non c'erano posti decenti? B: No, è stato per non sottrarre troppo tempo alla visita del pomeriggio che i panini sono stati mangiati, con una sosta molto breve. A: 'Why did tour participants prefer to eat some sandwiches instead of stopping at the restaurant? Were not there decent places?' B: 'No, it was not to subtract too much time from the afternoon tour that the sandwiches were eaten, with a very quick stop'.

Lit-P2	Mangiare la foglia/un panino	A: Come mai i partecipanti alla visita hanno preferito consumare dei panini anziché fermarsi al ristorante? Non c'erano posti decenti? B: No, è stato per non sottrarre troppo tempo alla visita del pomeriggio che sono stati mangiati i panini, con una sosta molto breve. A: 'Why did tour participants prefer to eat some sandwiches instead of stopping at the restaurant? Were not there decent places?' B: 'No, it was not to subtract too much time from the afternoon tour that lit. were eaten the sandwiches, with a very quick stop'.
Id-P1	Mettere le corna/le pizze	A: Per quale motivo Mattia è sempre stato tradito in tutte le sue relazioni precedenti? Perché le sue compagne finivano per annoiarsi? B: No, è per via della sua tendenza a scegliersi sempre partner inaffidabili che le corna gli sono state messe ogni volta, secondo me. A: 'Why was Mattia always cheated on in his previous relationships? Did his girlfriends end up bored?' B: 'No, it is because of his tendency to choose untrustworthy partners that the horns were put to him every time, in my opinion'.
Id-P2	Mettere le corna/le pizze	A: Per quale motivo Mattia è sempre stato tradito in tutte le sue relazioni precedenti? Perché le sue compagne finivano per annoiarsi? B: No, è per via della sua tendenza a scegliersi sempre partner inaffidabili che gli sono state messe le corna ogni volta, secondo me. A: 'Why was Mattia always cheated on in his previous relationships? Did his girlfriends end up bored?' B: 'No, it is because of his tendency to choose untrustworthy partners that lit. were put the horns to him every time, in my opinion'.
Lit-P1	Mettere le corna/le pizze	A: Il marito di Anna si è ricordato di riscaldare le due margherite in forno per quando la moglie sarebbe arrivata? O si è scordato? B: No, era già da dieci minuti buoni che le pizze erano state messe nel forno quando sua moglie era arrivata a casa dal lavoro dopo. A: 'Did Anna's husband remember to warm up the two margheritas in the oven in time for his wife to arrive? Or did he forget?' B: 'No, it was for ten minutes that the pizzas had been put in the oven when his wife came home from work later'.
Lit-P2	Mettere le corna/le pizze	A: Il marito di Anna si è ricordato di riscaldare le due margherite in forno per quando la moglie sarebbe arrivata? O si è scordato? B: No, era già da dieci minuti buoni che erano state messe le pizze nel forno quando sua moglie era arrivata a casa dal lavoro dopo. A: 'Did Anna's husband remember to warm up the two margheritas in the oven in time for his wife to arrive? Or did he forget?' B: 'No, it was for ten minutes that lit. had been put the pizzas in the oven when his wife came home from work later'.
Id-P1	Montare la testa/la scena	A: In che modo la famiglia di Claudio lo ha convinto di essere più bravo di quello che è? Premiandolo troppo per la promozione? B: No, è stato convincendolo che fosse in grado di frequentare il liceo classico che la testa gli è stata montata, a sentire gli amici. A: 'How did Claudio's family convince him that he was better than he actually is? By rewarding him too much for his promotion?' B: 'No, it was by convincing him that he could attend a high school specialized in Classics that the head was mounted to him, according to his friends'.
Id-P2	Montare la testa/la scena	A: In che modo la famiglia di Claudio lo ha convinto di essere più bravo di quello che è? Premiandolo troppo per la promozione? B: No, è stato convincendolo che fosse in grado di frequentare il liceo classico che gli è stata montata la testa, a sentire gli amici. A: 'How did Claudio's family convince him that he was better than he actually is? By rewarding him too much for his promotion?' B: 'No, it was by convincing him that he could attend a high school specialized in Classics that lit. was mounted the head to him, according to his friends'.
Lit-P1	Montare la testa/la scena	A: Per quale opera i ragazzi del laboratorio di teatro stavano allestendo la scenografia? Per Romeo e Giulietta? B: No, è per una rappresentazione del Re Lear che la scena è stata montata, anche se agli attori questa scenografia non è piaciuta. A: 'For which play were the theatre workshop pupils setting up the scenery? Romeo and Juliet?' B: 'No, it was for a King Lear staging that the scenery was mounted, although actors did not like it'.
Lit-P2	Montare la testa/la scena	A: Per quale opera i ragazzi del laboratorio di teatro stavano allestendo la scenografia? Per Romeo e Giulietta? B: No, è per una rappresentazione del Re Lear che è stata montata la scena, anche se agli attori questa scenografia non è piaciuta. A: 'For which play were the theatre workshop pupils setting up the scenery? Romeo and Juliet?' B: 'No, it was for a King Lear staging that lit. was mounted the scenery, although actors did not like it'.
Id-P1	Mozzare il fiato/il collo	A: Con quale brano l'orchestra di ieri sera ha davvero impressionato il pubblico, secondo te? Con l'ouverture del Tristano di Wagner? B: No, è stato con la Settima di Beethoven che il fiato è stato mozzato al pubblico, come leggevo dalle recensioni il giorno dopo. A: 'With which piece did the orchestra really impress the audience last night, in your opinion? With Tristan's overture by Wagner?' B: 'No, it was with Symphony no. 7 that the breath was cut off to the public, as I read on reviews the day after'.

Id-P2	Mozzare il fiato/il collo	A: Con quale brano l'orchestra di ieri sera ha davvero impressionato il pubblico, secondo te? Con l'ouverture del Tristano di Wagner? B: No, è stato con la Settima di Beethoven che è stato mozzato il fiato al pubblico, come leggevo dalle recensioni il giorno dopo. A: 'With which piece did the orchestra really impress the audience last night, in your opinion? With Tristan's overture by Wagner?' B: 'No, it was with Symphony no. 7 that lit. was cut off the breath to the public, as I read on reviews the day after'.
Lit-P1	Mozzare il fiato/il collo	A: Cosa hanno usato Piero e suo fratello per decapitare la vipera che stata per colpire la madre? Un coltello? B: No, è stato con una vanga che il collo le è stato mozzato con furia, appena prima che il serpente riuscisse a mordere la donna. A: 'What did Pietro and his brother use to behead the viper that was about to hit their mother? A knife?' B: 'No, it is with a spade that the neck was cut off to it furiously, right before it managed to bite the woman'.
Lit-P2	Mozzare il fiato/il collo	A: Cosa hanno usato Piero e suo fratello per decapitare la vipera che stata per colpire la madre? Un coltello? B: No, è stato con una vanga che le è stato mozzato il collo con furia, appena prima che il serpente riuscisse a mordere la donna. A: 'What did Pietro and his brother use to behead the viper that was about to hit their mother? A knife?' B: 'No, it is with a spade that lit. was cut off the neck to it furiously, right before it managed to bite the woman'.
Id-P1	Passare il testimone/il biglietto	A: A quale partito l'amministrazione uscente ha ceduto l'incarico di governare Pisa? Ai Radicali? B: No, è alla coalizione di centro-destra che il testimone è stato passato, come d'altronde è successo anche nel resto della Toscana. A: 'To which party did the outgoing council leave the job to govern Pisa? To Radicals?' B: 'No, it is to the center-right wing coalition that the baton was passed, as happened in the rest of Tuscany'.
Id-P2	Passare il testimone/il biglietto	A: A quale partito l'amministrazione uscente ha ceduto l'incarico di governare Pisa? Ai Radicali? B: No, è alla coalizione di centro-destra che è stato passato il testimone, come d'altronde è successo anche nel resto della Toscana. A: 'To which party did the outgoing council leave the job to govern Pisa? To Radicals?' B: 'No, it is to the center-right wing coalition that lit. was passed the baton, as happened in the rest of Tuscany'.
Lit-P1	Passare il testimone/il biglietto	A: A quale studente i compagni hanno dovuto prestare uno dei loro titoli di viaggio prima che arrivasse il controllore? A Gianni? B: No, è a Michele e a Giacomo che i biglietti sono stati passati appena in tempo perché non ricevessero la multa dal controllore. A: 'To which student did the classmates have to lend one of their travel documents before the ticket inspector arrived? To Gianni?' B: 'No, it is to Michele and to Giacomo that the tickets were passed just in time not to be fined by the inspector'.
Lit-P2	Passare il testimone/il biglietto	A: A quale studente i compagni hanno dovuto prestare uno dei loro titoli di viaggio prima che arrivasse il controllore? A Gianni? B: No, è a Michele e a Giacomo che sono stati passati i biglietti appena in tempo perché non ricevessero la multa dal controllore. A: 'To which student did the classmates have to lend one of their travel documents before the ticket inspector arrived? To Gianni?' B: 'No, it is to Michele and to Giacomo that lit. were passed the tickets just in time not to be fined by the inspector'.
Id-P1	Perdere il filo/una foto	A: Per quale motivo metà classe ha smesso di seguire la spiegazione della maestra? Perché suonava un allarme antincendio in corridoio? B: No, è perché i ragazzi erano distratti dal violento temporale fuori dalla finestra che il filo è stato perso, a quanto mi ricordo. A: 'Why did half the class stop to listen to the teacher's explanation? Was a fire alarm ringing in the corridor?' B: 'No, it is because the pupils were distracted by the violent thunderstorm outside the window that the thread was lost, as far as I can remember'.
Id-P2	Perdere il filo/una foto	A: Per quale motivo metà classe ha smesso di seguire la spiegazione della maestra? Perché suonava un allarme antincendio in corridoio? B: No, è perché i ragazzi erano distratti dal violento temporale fuori dalla finestra che è stato perso il filo, a quanto mi ricordo. A: 'Why did half the class stop to listen to the teacher's explanation? Was a fire alarm ringing in the corridor?' B: 'No, it is because the pupils were distracted by the violent thunderstorm outside the window that lit. was lost the thread, as far as I can remember'.
Lit-P1	Perdere il filo/una foto	A: Come mai Michela e Giulio non hanno più l'album del loro matrimonio sul pc? L'hanno cancellato per sbaglio? B: No, è perché il computer ha dovuto essere formattato che le foto sono state perse, ma per fortuna dei loro amici avevano delle copie. A: 'Why do not Michela and Giulio have the photo album of their wedding on their PC anymore? Did they delete it by mistake?' B: 'No, it is because the PC had to be formatted that the photos were lost, but luckily their friends had some copies'.

Lit-P2	Perdere il filo/una foto	A: Come mai Michela e Giulio non hanno più l'album del loro matrimonio sul pc? L'hanno cancellato per sbaglio? B: No, è perché il computer ha dovuto essere formattato che sono state perse le foto, ma per fortuna dei loro amici avevano delle copie. A: 'Why do not Michela and Giulio have the photo album of their wedding on their PC anymore? Did they delete it by mistake?' B: 'No, it is because the PC had to be formatted that lit. were lost the photos, but luckily their friends had some copies'.
Id-P1	Piantare le tende/delle palme	A: Come mai gli amici di Paolo si sono trasferiti in Australia e non intendono andarsene? Odiano l'Italia e volevano vivere altrove? B: No, è per il clima e per la maggiore disponibilità di lavoro che le tende sono state piantate proprio lì, a quanto mi dicevano. A: 'Why did Paolo's friends move to Australia and do not want to leave it? Do they hate Italy and did they want to live somewhere else?' B: 'No, it is for the weather and the greater job availability that the tents were pitched right there, from what I heard'.
Id-P2	Piantare le tende/delle palme	A: Come mai gli amici di Paolo si sono trasferiti in Australia e non intendono andarsene? Odiano l'Italia e volevano vivere altrove? B: No, è per il clima e per la maggiore disponibilità di lavoro che sono state piantate le tende proprio lì, a quanto mi dicevano. A: 'Why did Paolo's friends move to Australia and do not want to leave it? Do they hate Italy and did they want to live somewhere else?' B: 'No, it is for the weather and the greater job availability that lit. were pitched the tents right there, from what I heard'.
Lit-P1	Piantare le tende/delle palme	A: Perché la direzione dell'albergo ha fatto posizionare quegli alberi nel giardino antistante? Per un vezzo del proprietario? B: No, è stato per evitare che le panchine del giardino rimanessero al sole che le palme sono state piantate, come mi stavano spiegando. A: 'Why did the hotel direction have those trees planted in the garden in the front? Was it due to the owner's whim?' B: 'No, it was made to avoid that the benches in the garden stayed under the sun that the palm trees were planted, as they were explaining to me'.
Lit-P2	Piantare le tende/delle palme	A: Perché la direzione dell'albergo ha fatto posizionare quegli alberi nel giardino antistante? Per un vezzo del proprietario? B: No, è stato per evitare che le panchine del giardino rimanessero al sole che sono state piantate le palme, come mi stavano spiegando. A: 'Why did the hotel direction have those trees planted in the garden in the front? Was it due to the owner's whim?' B: 'No, it was made to avoid that the benches in the garden stayed under the sun that lit. were planted the palm trees, as they were explaining to me'.
Id-P1	Portare i pantaloni/il cappello	A: Chi è che comandava nella famiglia di Giovanni quando lui era piccolo? Il padre o il fratello maggiore? B: No, è assolutamente dalla mamma e dalla zia paterna che i pantaloni sono stati portati in casa loro, essendo entrambe molto tenaci. A: 'Who ruled in Giovanni's family when he was little? Was it his fater or his elder brother?' B: 'No, it is no doubt by his mother and his paternal aunt that the pants were worn in their house, since they were both very tenacious'.
Id-P2	Portare i pantaloni/il cappello	A: Chi è che comandava nella famiglia di Giovanni quando lui era piccolo? Il padre o il fratello maggiore? B: No, è assolutamente dalla mamma e dalla zia paterna che sono stati portati i pantaloni in casa loro, essendo entrambe molto tenaci. A: 'Who ruled in Giovanni's family when he was little? Was it his fater or his elder brother?' B: 'No, it is no doubt by his mother and his paternal aunt that lit. were worn the pants in their house, since they were both very tenacious'.
Lit-P1	Portare i pantaloni/il cappello	A: Perché tutti i partecipanti al funerale del giocatore non si sono tolti il berretto durante la funzione? Per irriverenza? B: No, è in onore al loro capitano che il cappello è stato portato per tutta la funzione, in quanto aveva l'emblema della squadra. A: 'Why did all the participants to the player's funeral did not take off their hat during the ceremony? Was it for lack of respect?' B: 'No, it is in honor of their captain that the hat was worn for the entire ceremony, since it had the team emblem on it'.
Lit-P2	Portare i pantaloni/il cappello	A: Perché tutti i partecipanti al funerale del giocatore non si sono tolti il berretto durante la funzione? Per irriverenza? B: No, è in onore al loro capitano che è stato portato il cappello per tutta la funzione, in quanto aveva l'emblema della squadra. A: 'Why did all the participants to the player's funeral did not take off their hat during the ceremony? Was it for lack of respect?' B: 'No, it is in honor of their captain that lit. was worn the hat for the entire ceremony, since it had the team emblem on it'.

Id-P1	Prendere una cotta/una felpa	A: Di chi si sarebbe innamorata buona parte della classe, stando alle dicerie? Del professore di educazione fisica? B: No, è per il nuovo alunno arrivato che la cotta è stata presa a quanto pare, essendo lui un ragazzo cordiale e di bella presenza. A: 'Who did most of the class fell in love with, according to the grapevine? The gymnastics professor?' B: 'No, it is for the newly arrived pupil that the crush was got apparently, since he is a cordial and good-looking boy'.
Id-P2	Prendere una cotta/una felpa	A: Di chi si sarebbe innamorata buona parte della classe, stando alle dicerie? Del professore di educazione fisica? B: No, è per il nuovo alunno arrivato che è stata presa la cotta a quanto pare, essendo lui un ragazzo cordiale e di bella presenza. A: 'Who did most of the class fell in love with, according to the grapevine? The gymnastics professor?' B: 'No, it is for the newly arrived pupil that lit. was got the crush apparently, since he is a cordial and good-looking boy'.
Lit-P1	Prendere una cotta/una felpa	A: Per chi avevano comprato il pullover i genitori di Luca e Davide? Per il primo dei due? B: No, è per il compleanno di Davide che la felpa è stata presa, a quanto ricordo, mentre per Luca avevano comprato un acquario nuovo. A: 'Who did Luca and Davide's parents buy the pullover for? The former?' B: 'No, it is for Davide's birthday that the sweater was taken, as far as I can remember, while they bought a new fish tank for Luca'.
Lit-P2	Prendere una cotta/una felpa	A: Per chi avevano comprato il pullover i genitori di Luca e Davide? Per il primo dei due? B: No, è per il compleanno di Davide che è stata presa la felpa, a quanto ricordo, mentre per Luca avevano comprato un acquario nuovo. A: 'Who did Luca and Davide's parents buy the pullover for? The former?' B: 'No, it is for Davide's birthday that lit. was taken the sweater, as far as I can remember, while they bought a new fish tank for Luca'.
Id-P1	Preparare il terreno/il viaggio	A: Per quale evento hanno creato le premesse tutti le recenti morti bianche in Italia? Per un intervento del sindacato? B: No, è proprio per una sollevazione di massa dei lavoratori che il terreno è stato preparato, considerate le proporzioni del problema. A: 'To what event did all the recent workplace death lead in Italy? To an intervention from the labor union?' B: 'No it is to a general worker uprising that the ground was prepared, considering what the proportions of the issue were'.
Id-P2	Preparare il terreno/il viaggio	A: Per quale evento hanno creato le premesse tutti le recenti morti bianche in Italia? Per un intervento del sindacato? B: No, è proprio per una sollevazione di massa dei lavoratori che è stato preparato il terreno, considerate le proporzioni del problema. A: 'To what event did all the recent workplace death lead in Italy? To an intervention from the labor union?' B: 'No it is to a general worker uprising that lit. was prepared the ground, considering what the proportions of the issue were'.
Lit-P1	Preparare il terreno/il viaggio	A: Quanto ci hanno impiegato Giulio e i suoi amici ad organizzare la loro vacanza in Giappone? È stato lungo? B: No, in realtà è giusto in pochi giorni che il viaggio è stato preparato, perché avevano già le idee molto chiare su cosa visitare. A: 'How long did it take to Giulio and his friends to organize their trip to Japan? Did it take long?' B: 'No, actually it is just in a few days that the trip was prepared because they already knew their mind about the places they wanted to visit'.
Lit-P2	Preparare il terreno/il viaggio	A: Quanto ci hanno impiegato Giulio e i suoi amici ad organizzare la loro vacanza in Giappone? È stato lungo? B: No, in realtà è giusto in pochi giorni che è stato preparato il viaggio, perché avevano già le idee molto chiare su cosa visitare. A: 'How long did it take to Giulio and his friends to organize their trip to Japan? Did it take long?' B: 'No, actually it is just in a few days that lit. was prepared the trip because they already knew their mind about the places they wanted to visit'.
Id-P1	Puntare il dito/la spada	A: A quale ciclista è stato imputato l'uso di anabolizzanti da parte del Tribunale dello Sport? È successo a Vincenzo Nibali? B: No, è contro Chris Froome che il dito è stato puntato, per via di una sospetta assunzione di anabolizzanti, poi rivelatasi falsa. A: 'Which cyclist was charged with anabolic usage by the court for sport? Did it happen to Vincenzo Nibali?' B: 'No, it is against Christ Froom that the finger was pointed, because of a suspected anabolic consumption, which was then proven to be false'.

Id-P2	Puntare il dito/la spada	A: A quale ciclista è stato imputato l'uso di anabolizzanti da parte del Tribunale dello Sport? È successo a Vincenzo Nibali? B: No, è contro Chris Froome che è stato puntato il dito, per via di una sospetta assunzione di anabolizzanti, poi rivelatasi falsa. A: 'Which cyclist was charged with anabolic usage by the court for sport? Did it happen to Vincenzo Nibali?' B: 'No, it is against Christ Froom that lit. was pointed the finger, because of a suspected anabolic consumption, which was then proven to be false'.
Lit-P1	Puntare il dito/la spada	A: Chi il cavaliere sta minacciando di uccidere nella scena che stanno rappresentando? Il principe? B: No, è contro il fratello del re che la spada è stata puntata per vendicare l'uccisione del padre, giusto sulla conclusione dell'atto. A: 'Who was the knight threatening to kill in the scene they are playing? The prince?' B: 'No, it is against the king's brother that the sword was pointed to avenge the father's murder, right at the end of the act'.
Lit-P2	Puntare il dito/la spada	A: Chi il cavaliere sta minacciando di uccidere nella scena che stanno rappresentando? Il principe? B: No, è contro il fratello del re che è stata puntata la spada per vendicare l'uccisione del padre, giusto sulla conclusione dell'atto. A: 'Who was the knight threatening to kill in the scene they are playing? The prince?' B: 'No, it is against the king's brother that lit. was pointed the sword to avenge the father's murder, right at the end of the act'.
Id-P1	Raggiungere il traguardo/l' aeroporto	A: Com'è stato riuscire a laurearsi per Matilde? È stato facile per lei? B: No, è solo con grande fatica e con molti sacrifici che il traguardo è stato raggiunto dopo anni, con grande sollievo dei genitori. A: 'How was it for Matilde to manage to graduate? Was it easy for her?' B: 'No, it is only with a hard job and a lot of sacrifices that the finish line was reached after years, with great relief for the parents'.
Id-P2	Raggiungere il traguardo/l' aeroporto	A: Com'è stato riuscire a laurearsi per Matilde? È stato facile per lei? B: No, è solo con grande fatica e con molti sacrifici che è stato raggiunto il traguardo dopo anni, con grande sollievo dei genitori. A: 'How was it for Matilde to manage to graduate? Was it easy for her?' B: 'No, it is only with a hard job and a lot of sacrifices that lit. was reached the finish line after years, with great relief for the parents'.
Lit-P1	Raggiungere il traguardo/l' aeroporto	A: Come ha fatto la vostra comitiva a dirigersi verso l'aerostazione al termine del viaggio? C'era un treno che la collegava col centro? B: No, è stato grazie ad un pullman prenotato dalla guida che l'aeroporto è stato raggiunto: non c'erano infatti altri modi per andarci. A: 'How did your group head to the terminal at the end of the trip? Was there a train connecting it to downtown?' B: 'No, it was thanks to a bus booked by the guide that the airport was reached: there was no other way to go there'.
Lit-P2	Raggiungere il traguardo/l' aeroporto	A: Come ha fatto la vostra comitiva a dirigersi verso l'aerostazione al termine del viaggio? C'era un treno che la collegava col centro? B: No, è stato grazie ad un pullman prenotato dalla guida che è stato raggiunto l'aeroporto: non c'erano infatti altri modi per andarci. A: 'How did your group head to the terminal at the end of the trip? Was there a train connecting it to downtown?' B: 'No, it was thanks to a bus booked by the guide that lit. was reached the airport: there was no other way to go there'.
Id-P1	Reggere la candela/il tendone	A: In che occasione i parenti di Mirko hanno dovuto assistere alle effusioni in pubblico tra lui e la sua compagna? Alla cena di Natale? B: No, è stato al suo pranzo di laurea che la candela è stata retta da tutti i presenti, senza che lui si accorgesse del loro imbarazzo. A: 'On which occasion did Mirko's relatives have to witness the public canoodling between him and his girlfriend?' At the Christmas dinner? B: 'No, it was at his graduation lunch that the candle was held by all the bystanders, without him noticing their embarrassment'.
Id-P2	Reggere la candela/il tendone	A: In che occasione i parenti di Mirko hanno dovuto assistere alle effusioni in pubblico tra lui e la sua compagna? Alla cena di Natale? B: No, è stato al suo pranzo di laurea che è stata retta la candela da tutti i presenti, senza che lui si accorgesse del loro imbarazzo. A: 'On which occasion did Mirko's relatives have to witness the public canoodling between him and his girlfriend?' At the Christmas dinner? B: 'No, it was at his graduation lunch that lit. was held the candle by all the bystanders, without him noticing their embarrassment'.

Lit-P1	Reggere la candela/il tendone	A: Come hanno impedito gli organizzatori del convegno che il gazebo crollasse per il forte vento? Era già stabile di suo? B: No, è stato grazie ad un sistema di cavi che il tendone è stato retto, impedendo che crollasse rovinosamente addosso ai invitati. A: 'How did the event organizers prevent the gazebo from falling down due to the strong wind? Was it already stable in and on itself?' B: 'No, it was thanks to a cable system that the tent was held, preventing it from falling on the guests'.
Lit-P2	Reggere la candela/il tendone	A: Come hanno impedito gli organizzatori del convegno che il gazebo crollasse per il forte vento? Era già stabile di suo? B: No, è stato grazie ad un sistema di cavi che è stato retto il tendone, impedendo che crollasse rovinosamente addosso ai invitati. A: 'How did the event organizers prevent the gazebo from falling down due to the strong wind? Was it already stable in and on itself?' B: 'No, it was thanks to a cable system that lit. was held the tent, preventing it from falling on the guests'.
Id-P1	Rischiare le penne/dei falli	A: In quale missione la squadra di pronto intervento per poco non è morta? Quando sono intervenuti nell'incendio della biblioteca? B: No, è stato quando hanno dovuto sgomberare i terremotati dalla casa pericolante che le penne sono state rischiate da tutti quanti. A: 'In which mission did the first aid squad barely die? When they intervened in the fire at the library?' B: 'No, it was when they had to evacuate the earthquake victims from the unsafe house that the feathers were risked by everyone'.
Id-P2	Rischiare le penne/dei falli	A: In quale missione la squadra di pronto intervento per poco non è morta? Quando sono intervenuti nell'incendio della biblioteca? B: No, è stato quando hanno dovuto sgomberare i terremotati dalla casa pericolante che sono state rischiate le penne da tutti quanti. A: 'In which mission did the first aid squad barely die? When they intervened in the fire at the library?' B: 'No, it was when they had to evacuate the earthquake victims from the unsafe house that lit. were risked the feathers by everyone'.
Lit-P1	Rischiare le penne/dei falli	A: Quando è successo che per poco il difensore degli avversari non facesse cadere Francesco? All'inizio della partita? B: No, è quando stava per segnare ai supplementari che il fallo è stato rischiatto, con il giocatore che gli si era lanciato contro. A: 'When did it happen that the opponent defender almost made Francesco fall? At the beginning of the match?' B: 'No, it was when he was about to score during the extra time that the foul was risked, with the player pouncing on him'.
Lit-P2	Rischiare le penne/dei falli	A: Quando è successo che per poco il difensore degli avversari non facesse cadere Francesco? All'inizio della partita? B: No, è quando stava per segnare ai supplementari che è stato rischiatto il fallo, con il giocatore che gli si era lanciato contro. A: 'When did it happen that the opponent defender almost made Francesco fall? At the beginning of the match?' B: 'No, it was when he was about to score during the extra time that lit. was risked the foul, with the player pouncing on him'.
Id-P1	Rivoltare la frittata/la tovaglia	A: La dirigenza come ha rigirato a suo vantaggio la critica di aver ridotto i fondi per le gite? Dicendo che tanto sono inutili? B: No, è stato dicendo che era un modo per evitare eccessive spese alle famiglie che la frittata è stata rivoltata con grande abilità. A: 'How did the principal spin in his own favor the criticism that he received for cutting funds for trips? By claiming they are useless anyway?' B: 'No, it was by telling that it was a way to spare families excessive expenses that the omelette was flipped very skillfully'.
Id-P2	Rivoltare la frittata/la tovaglia	A: La dirigenza come ha rigirato a suo vantaggio le critiche ricevute per aver ridotto i fondi per le gite? Dicendo che tanto sono inutili? B: No, è stato dicendo che era un modo per evitare eccessive spese alle famiglie che è stata rivoltata la frittata con grande abilità. A: 'How did the principal spin in his own favor the criticism that he received for cutting funds for trips? By claiming they are useless anyway?' B: 'No, it was by telling that it was a way to spare families excessive expenses that lit. was flipped the omelette very skillfully'.
Lit-P1	Rivoltare la frittata/la tovaglia	A: Come mai i camerieri si sono messi a rovistare nel telo che era steso sul tavolo? Perché pensavano ci fosse dentro un insetto? B: No, è stato per cercare il portafoglio di un cliente del locale che la tovaglia è stata rivoltata, purtroppo con scarsi risultati. A: 'Why did the waiters started to search through the cloth that was spread out on the table? Did they think there was an insect inside?' B: 'No, it was to look for the wallet of a customer of the restaurant that the tablecloth was flipped, unfortunately with poor results'.
Lit-P2	Rivoltare la frittata/la tovaglia	A: Come mai i camerieri si sono messi a rovistare nel telo che era steso sul tavolo? Perché pensavano ci fosse dentro un insetto? B: No, è stato per cercare il portafoglio di un cliente del locale che è stata rivoltata la tovaglia, purtroppo con scarsi risultati. A: 'Why did the waiters started to search through the cloth that was spread out on the table? Did they think there was an insect inside?' B: 'No, it was to look for the wallet of a customer of the restaurant that lit. was flipped the tablecloth, unfortunately with poor results'.

Id-P1	Rompere le scatole/gli occhiali	<p>A: Su quale punto hanno insistito noiosamente i condomini all'assemblea? Sugli orari oltre cui non è permesso essere rumorosi la sera?</p> <p>B: No, è sulla pulizia degli spazi comuni che le scatole sono state rotte, poiché spesso ci sono mozziconi per terra nell'ingresso.</p> <p>A: 'On which point did the residents boringly insist during the meeting? On the times after which it is not possible to make noise anymore in the evening?'</p> <p>B: 'No, it is on the cleanliness of shared spaces that the boxes were smashed up, considering there are often cigarette butts on the floor at the entrance'.</p>
Id-P2	Rompere le scatole/gli occhiali	<p>A: Su quale punto hanno insistito noiosamente i condomini all'assemblea? Sugli orari oltre cui non è permesso essere rumorosi la sera?</p> <p>B: No, è sulla pulizia degli spazi comuni che sono state rotte le scatole, considerato che spesso ci sono mozziconi per terra nell'ingresso.</p> <p>A: 'On which point did the residents boringly insist during the meeting? On the times after which it is not possible to make noise anymore in the evening?'</p> <p>B: 'No, it is on the cleanliness of shared spaces that lit. were smashed up the boxes, considering there are often cigarette butts on the floor at the entrance'.</p>
Lit-P1	Rompere le scatole/gli occhiali	<p>A: Quand'è successo che dei compagni di scuola di Andrea gli hanno spaccato le lenti? Durante un litigio?</p> <p>B: No, è stato durante una partita di pallamano che gli occhiali gli sono stati rotti con un calcio, stando al racconto della maestra.</p> <p>A: 'When did it happen that Andrea's classmates broke his lenses? During a fight?'</p> <p>B: 'No, it was during a handball match that the glasses were broken to him with a kick, according to the teacher's account'.</p>
Lit-P2	Rompere le scatole/gli occhiali	<p>A: Quand'è successo che dei compagni di scuola di Andrea gli hanno spaccato le lenti? Durante un litigio?</p> <p>B: No, è stato durante una partita di pallamano che gli sono stati rotti gli occhiali con un calcio, stando al racconto della maestra.</p> <p>A: 'When did it happen that Andrea's classmates broke his lenses? During a fight?'</p> <p>B: 'No, it was during a handball match that lit. were broken the glasses to him with a kick, according to the teacher's account'.</p>
Id-P1	Saltare il fosso/la corsia	<p>A: Cosa ha convinto Angelo a mollare tutto e a partire definitivamente per il Canada? Il clima politico attuale?</p> <p>B: No, per la sua voglia di cambiare vita e contesto sociale che il fosso è stato saltato da lui, con la scelta di trasferirsi lì.</p> <p>A: 'What convinced Angelo to leave everything and leave for Canada for good? The current political climate?'</p> <p>B: 'No, it is for his desire to change life and social context that the ditch was jumped by him, with his choice to move there'.</p>
Id-P2	Saltare il fosso/la corsia	<p>A: Cosa ha convinto Angelo a mollare tutto e a partire definitivamente per il Canada? Il clima politico attuale?</p> <p>B: No, per la sua voglia di cambiare vita e contesto sociale che è stato saltato il fosso da lui, con la scelta di trasferirsi lì.</p> <p>A: 'What convinced Angelo to leave everything and leave for Canada for good? The current political climate?'</p> <p>B: 'No, it is for his desire to change life and social context that lit. was jumped the ditch by him, with his choice to move there'.</p>
Lit-P1	Saltare il fosso/la corsia	<p>A: Quale motivo ha spinto i due tir a buttarsi sull'altra parte della carreggiata con una manovra azzardata? Erano ubriachi gli autisti?</p> <p>B: No, è stato per evitare la collisione con un veicolo fermo sulla strada che la corsia è stata saltata evitando così l'incidente.</p> <p>A: 'What brought the two trucks to bounce on the other side of the roadway with a hazardous manœuvre? Were the drivers drunk?'</p> <p>B: 'No, it was in order to avoid the collision with a vehicle stopped on the street that the lane was jumped, thus avoiding the incident'.</p>
Lit-P2	Saltare il fosso/la corsia	<p>A: Quale motivo ha spinto i due tir a buttarsi sull'altra parte della carreggiata con una manovra azzardata? Erano ubriachi gli autisti?</p> <p>B: No, è stato per evitare la collisione con un veicolo fermo sulla strada che è stata saltata la corsia evitando così l'incidente.</p> <p>A: 'What brought the two trucks to bounce on the other side of the roadway with a hazardous manœuvre? Were the drivers drunk?'</p> <p>B: 'No, it was in order to avoid the collision with a vehicle stopped on the street that lit. was jumped the lane, thus avoiding the incident'.</p>
Id-P1	Salvare la faccia/l'affare	<p>A: Come sono riusciti i giocatori della nazionale a prevenire una sconfitta umiliante all'ultima partita? Segnando ai supplementari?</p> <p>B: No, è stato grazie ad un rigore segnato dopo i supplementari che la faccia è stata salvata alla squadra, con sollievo generale.</p> <p>A: 'How did the national team players manage to ward off a humiliating defeat during the last match? By scoring during the extra time?'</p> <p>B: 'No, it was thanks to a penalty that was scored after the extra time that the face was saved to the team, with general relief'.</p>

Id-P2	Salvare la faccia/l'affare	A: Come sono riusciti i giocatori della nazionale a prevenire una sconfitta umiliante all'ultima partita? Segnando ai supplementari? B: No, è stato grazie ad un rigore segnato dopo i supplementari che è stata salvata la faccia alla squadra, con sollievo generale. A: 'How did the national team players manage to ward off a humiliating defeat during the last match? By scoring during the extra time?' B: 'No, it was thanks to a penalty that was scored after the extra time that lit. was saved the face to the team, with general relief'.
Lit-P1	Salvare la faccia/l'affare	A: Com'è riuscito l'amministratore delegato ad impedire che l'accordo andasse in fumo? Facendo riappacificare le parti? B: No, è stato solo cercando dei nuovi partner stranieri che l'affare è stato salvato, altrimenti si prospettava un futuro incerto. A: 'How did the CEO manage to prevent the deal from going up in smoke? Making the parties make peace with each other?' B: 'No, it is only by looking for new foreign partners that the deal was saved, otherwise an uncertain future was presenting itself'.
Lit-P2	Salvare la faccia/l'affare	A: Com'è riuscito l'amministratore delegato ad impedire che l'accordo andasse in fumo? Facendo riappacificare le parti? B: No, è stato solo cercando dei nuovi partner stranieri che è stato salvato l'affare, altrimenti si prospettava un futuro incerto. A: 'How did the CEO manage to prevent the deal from going up in smoke? Making the parties make peace with each other?' B: 'No, it is only by looking for new foreign partners that lit. was saved the deal, otherwise an uncertain future was presenting itself'.
Id-P1	Scavare la fossa/un solco	A: In che modo i ministri hanno tramato contro i magistrati che stavano indagando su di loro? Con degli attentati a loro danno? B: No, è stato diffondendo delle notizie diffamatorie che la fossa è stata scavata a tutti loro, inimicando loro l'opinione pubblica. A: 'How did ministers plot against magistrates who were investigating on them? With attacks to their detriments?' B: 'No, it is by spreading defamatory news that the pit was dug to all of them, pitting public opinion against them'.
Id-P2	Scavare la fossa/un solco	A: In che modo i ministri hanno tramato contro i magistrati che stavano indagando su di loro? Con degli attentati a loro danno? B: No, è stato diffondendo notizie diffamatorie che è stata scavata la fossa a tutti loro, inimicando loro l'opinione pubblica. A: 'How did ministers plot against magistrates who were investigating on them? With attacks to their detriments?' B: 'No, it is by spreading defamatory news that lit. was dug the pit to all of them, pitting public opinion against them'.
Lit-P1	Scavare la fossa/un solco	A: Quale processo ha creato le erosioni nella roccia che si vedono nelle Crete Senesi? Una frana? B: No, è stato per l'azione dell'acqua che i solchi sono stati scavati, formando dei calanchi, stando a quanto avevo studiato a scuola. A: 'What process created the rock erosions that can be seen in the Siene Clays? A landslide?' B: 'No, it was due to the water's action that the cracks were dug, creating some ravines, based on what I studied at school'.
Lit-P2	Scavare la fossa/un solco	A: Quale processo ha creato le erosioni nella roccia che si vedono nelle Crete Senesi? Una frana? B: No, è stato per l'azione dell'acqua che sono stati scavati i solchi, formando dei calanchi, stando a quanto avevo studiato a scuola. A: 'What process created the rock erosions that can be seen in the Siene Clays? A landslide?' B: 'No, it was due to the water's action that lit. were dug the cracks, creating some ravines, based on what I studied at school'.
Id-P1	Scoprire le carte/il volto	A: Quando è successo che Francesca e Thomas hanno finalmente svelato il loro progetto di sposarsi? Lo scorso Natale? B: No, è stato durante un brindisi a cena con gli amici questo sabato che le carte sono state scoperte, con meraviglia dei presenti. A: 'When did it happen that Francesca and Thomas finally disclosed their plan to get married? Last Christmas?' B: 'No, it was during a toast at a dinner with their friends last Saturday that the cards were uncovered, leaving the bystanders astonished'.
Id-P2	Scoprire le carte/il volto	A: Quando è successo che Francesca e Thomas hanno finalmente svelato il loro progetto di sposarsi? Lo scorso Natale? B: No, è stato durante un brindisi a cena con gli amici questo sabato che sono state scoperte le carte, con meraviglia dei presenti. A: 'When did it happen that Francesca and Thomas finally disclosed their plan to get married? Last Christmas?' B: 'No, it was during a toast at a dinner with their friends last Saturday that lit. were uncovered the cards, leaving the bystanders astonished'.
Lit-P1	Scoprire le carte/il volto	A: Perché mai l'attore protagonista si è tolto la maschera solo alla fine dello spettacolo? Era scritto nel copione originale? B: No, è stato per una scelta degli sceneggiatori che il volto è stato scoperto alla fine, per mantenere il dubbio sulla sua identità. A: 'How come the main actor removed his mask only at the end of the play? Was it written on the original script?' B: 'No, it was due to a screenwriters' choice that the face was uncovered only in the end, to leave a doubt on his identity'.

Lit-P2	Scoprire le carte/il volto	A: Perché mai l'attore protagonista si è tolto la maschera solo alla fine dello spettacolo? Era scritto nel copione originale? B: No, è stato per una scelta degli sceneggiatori che è stato scoperto il volto alla fine, per mantenere il dubbio sulla sua identità. A: 'How come the main actor removed his mask only at the end of the play? Was it written on the original script?' B: 'No, it was due to a screenwriters' choice that lit. was uncovered the face only in the end, to leave a doubt on his identity'.
Id-P1	Segare le gambe/le catene	A: In che modo il Comune vi ha impedito di tenere un corso di educazione sessuale nel liceo? Facendovi scontrare i genitori dei ragazzi? B: No, è stato riducendo drasticamente i fondi per attuare il progetto che le gambe ci sono state segate, con grande rabbia di tutti. A: 'How did the city council prevent you from giving a sex education course at the high school? By making you fight with the pupil's parents?' B: 'No, it was by drastically cutting the funds for carrying out the project that the legs were sawed to us, making everyone angry'.
Id-P2	Segare le gambe/le catene	A: In che modo il Comune vi ha impedito di tenere un corso di educazione sessuale nel liceo? Facendovi scontrare i genitori dei ragazzi? B: No, è stato riducendo drasticamente i fondi per attuare il progetto che ci sono state segate le gambe, con grande rabbia di tutti. A: 'How did the city council prevent you from giving a sex education course at the high school? By making you fight with the pupil's parents?' B: 'No, it was by drastically cutting the funds for carrying out the project that lit. were sawed the legs to us, making everyone angry'.
Lit-P1	Segare le gambe/le catene	A: Com'è riuscito il gruppo di animalisti a liberare i cani che erano intrappolati nello scantinato? È stata un'operazione semplice? B: No, è stato solo usando delle tenaglie che le catene sono state spezzate e gli animali sono potuti fuggire evitando di essere uccisi. A: 'How did the animal-activist group manage to free the dogs that were trapped in the cellar? Was it a simple operation?' B: 'No, it was just by using pincers that the chains were broken and the animals could flee, avoiding to be killed'.
Lit-P2	Segare le gambe/le catene	A: Com'è riuscito il gruppo di animalisti a liberare i cani che erano intrappolati nello scantinato? È stata un'operazione semplice? B: No, è stato solo usando delle tenaglie che sono state spezzate le catene e gli animali sono potuti fuggire evitando di essere uccisi. A: 'How did the animal-activist group manage to free the dogs that were trapped in the cellar? Was it a simple operation?' B: 'No, it was just by using pincers that lit. were broken the chains and the animals could flee, avoiding to be killed'.
Id-P1	Spezzare una lancia/il calice	A: Per chi hanno parteggiato i compagni di Federico quando il professore di educazione fisica si è scontrato con lui? Per Federico? B: No, è per il professore di educazione fisica che la lancia è stata spezzata, sostenendo che aveva giustamente rimproverato l'alunno. A: 'Who did Federico's classmates side with when the gymnastics professor argued with him? With Federico?' B: 'No, it is for the gymnastics professor that the spear was broken, by claiming that he had deservedly scolded the pupil'.
Id-P2	Spezzare una lancia/il calice	A: Per chi hanno parteggiato i compagni di Federico quando il professore di educazione fisica si è scontrato con lui? Per Federico? B: No, è per il professore di educazione fisica che è stata spezzata la lancia, sostenendo che aveva giustamente rimproverato l'alunno. A: 'Who did Federico's classmates side with when the gymnastics professor argued with him? With Federico?' B: 'No, it is for the gymnastics professor that lit. was broken the spear, by claiming that he had deservedly scolded the pupil'.
Lit-P1	Spezzare una lancia/il calice	A: Per quale motivo Irene ha frantumato il bicchiere che stava tenendo in mano per il brindisi? Era arrabbiata? B: No, è stato per il nervosismo del momento che il calice è stato spezzato, ma per fortuna nessuno presente alla festa l'ha notato. A: 'Why did Irene shatter the glass she was holding in her hands for the toast? Was she angry?' B: 'No, it was due to the irritability of the moment that the goblet was broken, but luckily none of the people at the party noticed it'.
Lit-P2	Spezzare una lancia/il calice	A: Per quale motivo Irene ha frantumato il bicchiere che stava tenendo in mano per il brindisi? Era arrabbiata? B: No, è stato per il nervosismo del momento che è stato spezzato il calice, ma per fortuna nessuno presente alla festa l'ha notato. A: 'Why did Irene shatter the glass she was holding in her hands for the toast? Was she angry?' B: 'No, it was due to the irritability of the moment that lit. was broken the goblet, but luckily none of the people at the party noticed it'.

Id-P1	Sputare i polmoni/un insetto	A: Perché la squadra regionale di pallanuoto è apparsa così affaticata durante la finale? Non si erano allenati a sufficienza? B: No, è perché erano rimasti tutti svegli fino a tardi la sera prima che i polmoni sono stati sputati durante il match, a quanto so. A: 'Why did the regional water polo team appear so tired during the final match? Did not they train enough?' B: 'No, it is because they all stayed awake until late the night before that the lungs were spat during the match, as far as I know'.
Id-P2	Sputare i polmoni/un insetto	A: Perché la squadra regionale di pallanuoto è apparsa così affaticata durante la finale? Non si erano allenati a sufficienza? B: No, è perché erano rimasti tutti svegli fino a tardi la sera prima che sono stati sputati i polmoni durante il match, a quanto so. A: 'Why did the regional water polo team appear so tired during the final match? Did not they train enough?' B: 'No, it is because they all stayed awake until late the night before that lit. were spat the lungs during the match, as far as I know'.
Lit-P1	Sputare i polmoni/un insetto	A: A che punto della cena Gianni si è ritrovato una mosca in bocca? Durante il dessert? B: No, è stato mentre stava consumando l'insalata che l'insetto è stato sputato nel piatto, con grande disgusto suo e degli altri. A: 'At which point of the dinner Gianni found a fly in his mouth? During dessert?' B: 'No, it is while they were eating the salad that the insect was spat into the plate, with great disgust from himself and the others'.
Lit-P2	Sputare i polmoni/un insetto	A: A che punto della cena Gianni si è ritrovato una mosca in bocca? Durante il dessert? B: No, è stato mentre stava consumando l'insalata che è stato sputato l'insetto nel piatto, con grande disgusto suo e degli altri. A: 'At which point of the dinner Gianni found a fly in his mouth? During dessert?' B: 'No, it is while they were eating the salad that lit. was spat the insect into the plate, with great disgust from himself and the others'.
Id-P1	Staccare la spina/la sella	A: Da quanto tempo la tua famiglia è andata in vacanza ormai? Saranno già un paio di settimane? B: No, è da almeno due mesi buoni che la spina è stata staccata andando tutti al mare, dopo l'annata stressante che abbiamo avuto. A: 'How long has your family been on holiday by now? Will it be two weeks already?' B: 'No, it is at least for two months that the plug was pulled by going all to the seaside, after the stressful year we had'.
Id-P2	Staccare la spina/la sella	A: Da quanto tempo la tua famiglia è andata in vacanza ormai? Saranno già un paio di settimane? B: No, è da almeno un mese buono che è stata staccata la spina andando tutti al mare, dopo l'annata stressante che abbiamo avuto. A: 'How long has your family been on holiday by now? Will it be two weeks already?' B: 'No, it is at least for two months that lit. was pulled the plug by going all to the seaside, after the stressful year we had'.
Lit-P1	Staccare la spina/la sella	A: Per quale motivo all'officina hanno svitato il sedile alla moto che Daniele aveva consegnato in riparazione? Per sostituirlo? B: No, è stato per accedere alle componenti sottostanti del motore che la sella è stata staccata, a quanto mi spiegavano i meccanici. A: 'Why did the people at the repair shop unscrew the seat of the motorbike that Daniele had given them to be repaired? To replace it?' B: 'No, it was to access to the underlying components of the engine that the seat was removed, based on what mechanics were explaining to me'.
Lit-P2	Staccare la spina/la sella	A: Per quale motivo all'officina hanno svitato il sedile alla moto che Daniele aveva consegnato in riparazione? Per sostituirlo? B: No, è stato per accedere alle componenti sottostanti del motore che è stata staccata la sella, a quanto mi spiegavano i meccanici. A: 'Why did the people at the repair shop unscrew the seat of the motorbike that Daniele had given them to be repaired? To replace it?' B: 'No, it was to access to the underlying components of the engine that lit. was removed the seat, based on what mechanics were explaining to me'.
Id-P1	Stringere i denti/le ruote	A: Per quanto tempo i figli di Maurizio hanno resistito a gestire da sé il padre malato e infermo? Per qualche settimana? B: No, è stato per diversi mesi che i denti sono stati stretti, finché i figli non hanno deciso di assumere un'infermiera part-time. A: 'How long did Maurizio's children resist to deal on their own with their sick and invalid dad? For some weeks?' B: 'No, it was for many months that the teeth were gritted, until his children decided to hire a part-time nurse'.
Id-P2	Stringere i denti/le ruote	A: Per quanto tempo i figli di Maurizio hanno resistito a gestire da sé il padre malato e infermo? Per qualche settimana? B: No, è stato per diversi mesi che sono stati stretti i denti, finché i figli non hanno deciso di assumere un'infermiera part-time. A: 'How long did Maurizio's children resist to deal on their own with their sick and invalid dad? For some weeks?' B: 'No, it was for many months that lit. was gritted the teeth, until his children decided to hire a part-time nurse'.

Lit-P1	Stringere i denti/le ruote	A: Come hanno riavvitato il mozzo anteriore della tua bici all'officina? Hanno lavorato a mano con lo sgancio rapido? B: No, è con la chiave inglese che le ruote sono state strette per essere sicuri che non cedessero, come mi raccontava il meccanico. A: 'How did they screw the anterior hub of your bike at the repair shop? Did they do it manually by quickly unhooking it?' B: 'No, it is with a wrench that the wheels were screwed to make sure they would not slacken, as the mechanic was telling me'.
Lit-P2	Stringere i denti/le ruote	A: Come hanno riavvitato il mozzo anteriore della tua bici all'officina? Hanno lavorato a mano con lo sgancio rapido? B: No, è con la chiave inglese che sono state strette le ruote per essere sicuri che non cedessero, come mi raccontava il meccanico. A: 'How did they screw the anterior hub of your bike at the repair shop? Did they do it manually by quickly unhooking it?' B: 'No, it is with a wrench that lit. were screwed the wheels to make sure they would not slacken, as the mechanic was telling me'.
Id-P1	Subire uno scacco/uno scippo	A: Quand'è successo che il Partito Democratico abbia ricevuto un'umiliante sconfitta alle elezioni politiche? Nel 2013? B: No, è stato alle elezioni del 2018 che lo scacco è stato subito, con una vittoria schiacciante da parte dei Grillini e della Lega. A: 'When did it happen that the Democratic Party received a humiliating defeat at political elections? In 2013?' B: 'No, it was at 2018 elections that the checkmate was suffered, with an overwhelming victory of the Five Star Movements and the League'.
Id-P2	Subire uno scacco/uno scippo	A: Quand'è successo che il Partito Democratico abbia ricevuto un'umiliante sconfitta alle elezioni politiche? Nel 2013? B: No, è stato alle elezioni del 2018 che è stato subito lo scacco, con una vittoria schiacciante da parte dei Grillini e della Lega. A: 'When did it happen that the Democratic Party received a humiliating defeat at political elections? In 2013?' B: 'No, it was at 2018 elections that lit. was suffered the checkmate, with an overwhelming victory of the Five Star Movements and the League'.
Lit-P1	Subire uno scacco/uno scippo	A: Dov'è che a una delle turiste del museo hanno sottratto il portafoglio? Nella sezione delle statue greche? B: No, è stato proprio all'ingresso del museo che lo scippo è stato subito, ma per fortuna la polizia ha già rintracciato il colpevole. A: 'Where did they steal the wallet to one of the tourists? At the Greek statue section?' B: 'No, it was right at the entrance of the museum that the mugging was suffered, but fortunately the police already traced the culprit'.
Lit-P2	Subire uno scacco/uno scippo	A: Dov'è che a una delle turiste del museo hanno sottratto il portafoglio? Nella sezione delle statue greche? B: No, è stato proprio all'ingresso del museo che è stato subito lo scippo, ma per fortuna la polizia ha già rintracciato il colpevole. A: 'Where did they steal the wallet to one of the tourists? At the Greek statue section?' B: 'No, it was right at the entrance of the museum that lit. was suffered the mugging, but fortunately the police already traced the culprit'.
Id-P1	Tagliare la corda/la barba	A: Per quale motivo i partecipanti alla festa di ieri sera sono fuggiti dalla sala d'un tratto? Per una fuga di gas? B: No, è stato per un allarme antincendio che la corda è stata tagliata, anche se poi si è capito che si era attivato per sbaglio. A: 'Why did the participants to the party yesterday night escape from the hall all of a sudden? Was it due to a gas leak?' B: 'No, it was for a fire alarm that the rope was cut, although they found out later that it had been activated by mistake'.
Id-P2	Tagliare la corda/la barba	A: Per quale motivo i partecipanti alla festa di ieri sera sono fuggiti dalla sala d'un tratto? Per una fuga di gas? B: No, è stato per un allarme antincendio che è stata tagliata la corda, anche se poi si è capito che si era attivato per sbaglio. A: 'Why did the participants to the party yesterday night escape from the hall all of a sudden? Was it due to a gas leak?' B: 'No, it was for a fire alarm that lit. was cut the rope, although they found out later that it had been activated by mistake'.
Lit-P1	Tagliare la corda/la barba	A: Perché i truccatori hanno rasato il volto di Andrea mentre lo preparavano per lo spettacolo anche se non voleva? Per iniziativa loro? B: No, è per ordine del regista che la barba gli è stata tagliata per riuscire poi a creare un trucco più convincente per la recita. A: 'Why did make up artists shave Andrea's face while they were setting him up for the play even though he did not want it? Did they take the initiative?' B: 'No, it was due to an order from the director that the beard was trimmed to him to then create a more convincing make-up for the play'.

Lit-P2	Tagliare la corda/la barba	<p>A: Perché i truccatori hanno rasato il volto di Andrea mentre lo preparavano per lo spettacolo anche se non voleva? Per iniziativa loro?</p> <p>B: No, è per ordine del regista che gli è stata tagliata la barba per riuscire poi a creare un trucco più convincente per la recita.</p> <p>A: ‘Why did make up artists shave Andrea’s face while they were setting him up for the play even though he did not want it? Did they take the initiative?’</p> <p>B: ‘No, it was due to an order from the director that lit. was trimmed the beard to him to then create a more convincing make-up for the play’.</p>
Id-P1	Tentare la sorte/un furto	<p>A: Perché così tanti somali hanno azzardato un’attraversata così rischiosa del Mediterraneo quest’anno? Per via di una crisi economica?</p> <p>B: No, è per sfuggire ad una guerra endemica nel loro paese che la sorte è stata tentata da tutti loro, con esiti spesso drammatici.</p> <p>A: ‘Why did so many Somali people attempt such a risky crossing of the Mediterranean sea this year? Was it due to an economic crisis?’</p> <p>B: ‘No, it is to escape from an endemic war in their country that the luck was tried by all of them, often with tragic outcomes’.</p>
Id-P2	Tentare la sorte/un furto	<p>A: Perché così tanti somali hanno azzardato un’attraversata così rischiosa del Mediterraneo quest’anno? Per via di una crisi economica?</p> <p>B: No, è per sfuggire ad una guerra endemica nel loro paese che è stata tentata la sorte da tutti loro, con esiti spesso drammatici.</p> <p>A: ‘Why did so many Somali people attempt such a risky crossing of the Mediterranean sea this year? Was it due to an economic crisis?’</p> <p>B: ‘No, it is to escape from an endemic war in their country that lit. was tried the luck by all of them, often with tragic outcomes’.</p>
Lit-P1	Tentare la sorte/un furto	<p>A: Perché Giacomo e i suoi fratelli hanno cercato di rubare dalla gioielleria in centro? Perché sono dei malviventi?</p> <p>B: No, è perché sono rimasti entrambi disoccupati e bisognosi di denaro che il furto è stato tentato, come dicevano poi alla polizia.</p> <p>A: ‘Why did Giacomo and his brother try to rob the jewelry store downtown? Is it because they are criminals?’</p> <p>B: ‘No, it is because they both found themselves unemployed and in need of money that the robbery was attempted, as they were telling later to the police’.</p>
Lit-P2	Tentare la sorte/un furto	<p>A: Perché Giacomo e i suoi fratelli hanno cercato di rubare dalla gioielleria in centro? Perché sono dei malviventi?</p> <p>B: No, è perché sono rimasti entrambi disoccupati e bisognosi di denaro che è stato tentato il furto, come dicevano poi alla polizia.</p> <p>A: ‘Why did Giacomo and his brother try to rob the jewelry store downtown? Is it because they are criminals?’</p> <p>B: ‘No, it is because they both found themselves unemployed and in need of money that lit. was attempted the robbery, as they were telling later to the police’.</p>
Id-P1	Tirare la corda/il freno	<p>A: Come sono riusciti i ragazzi del corso di nuoto ad esasperare gli allenatori alla lunga? Chiacchierando sempre durante il corso?</p> <p>B: No, è stato con le continue risse negli spogliatoi che la corda è stata tirata troppo a lungo, causando la sospensione del corso.</p> <p>A: ‘How did pupils at the swimming class manage to piss the coaches off in the long run? Did they always chat during the classes?’</p> <p>B: ‘No, it was with repeated fights in the dressing rooms that the rope was pulled for too long, causing the classes to be suspended’.</p>
Id-P2	Tirare la corda/il freno	<p>A: Come sono riusciti i ragazzi del corso di nuoto ad esasperare gli allenatori alla lunga? Chiacchierando sempre durante il corso?</p> <p>B: No, è stato con le continue risse negli spogliatoi che è stata tirata la corda troppo a lungo, causando la sospensione del corso.</p> <p>A: ‘How did pupils at the swimming class manage to piss the coaches off in the long run? Did they always chat during the classes?’</p> <p>B: ‘No, it was with repeated fights in the dressing rooms that lit. was pulled the rope for too long, causing the classes to be suspended’.</p>
Lit-P1	Tirare la corda/il freno	<p>A: Cos’è successo quando la macchina è finita sui binari del tram? L’autista del mezzo è riuscito a frenare subito?</p> <p>B: No, è stato solo appena prima che il tram colpisse la macchina che il freno è stato tirato, evitando l’incidente per un soffio.</p> <p>A: ‘What happened when the car ended up on the cable car’s tracks? Did the driver manage to brake immediately?’</p> <p>B: ‘No, it was just before the cable car hit the car that the brake was pulled, avoiding the incident by a whisker’.</p>
Lit-P2	Tirare la corda/il freno	<p>A: Cos’è successo quando la macchina è finita sui binari del tram? L’autista del mezzo è riuscito a frenare subito?</p> <p>B: No, è stato solo appena prima che il tram colpisse la macchina che è stato tirato il freno, evitando l’incidente per un soffio.</p> <p>A: ‘What happened when the car ended up on the cable car’s tracks? Did the driver manage to brake immediately?’</p> <p>B: ‘No, it was just before the cable car hit the car that lit. was pulled the brake, avoiding the incident by a whisker’.</p>

Id-P1	Trovare la chiave/del denaro	A: Quanto hanno impiegato i tecnici per capire come risolvere il guasto alla rete informatica? Sono riusciti a risolvere in poche ore? B: No, è stato solo dopo un'intera settimana di lavoro che la chiave è stata trovata e il problema è stato così finalmente risolto. A: 'How long did it take to technicians to fix the bug in the computer network? Did they fix it in a few hours?' B: 'No, it was only after an intense week of work that the key was found and the issue was thus finally worked out'.
Id-P2	Trovare la chiave/del denaro	A: Quanto hanno impiegato i tecnici per capire come risolvere il guasto alla rete informatica? Sono riusciti a risolvere in poche ore? B: No, è stato solo dopo un'intera settimana di lavoro che è stata trovata la chiave e il problema è stato così finalmente risolto. A: 'How long did it take to technicians to fix the bug in the computer network? Did they fix it in a few hours?' B: 'No, it was only after an intense week of work that lit. was found the key and the issue was thus finally worked out'.
Lit-P1	Trovare la chiave/del denaro	A: Dove i carabinieri hanno rinvenuto tutti i soldi che appartenevano all'uomo ucciso nei bagni del treno? Vicino al corpo? B: No, è sul pavimento della carrozza che il denaro è stato ritrovato durante la perquisizione, stando a quanto si legge sul verbale. A: 'Where did the police find all the money that belonged to the man killed in the train's bathroom? Next to his body?' B: 'No, it was on the car's floor that the money was found during the inspection, based on what can be read in the minutes'.
Lit-P2	Trovare la chiave/del denaro	A: Dove i carabinieri hanno rinvenuto tutti i soldi che appartenevano all'uomo ucciso nei bagni del treno? Vicino al corpo? B: No, è sul pavimento della carrozza che è stato ritrovato il denaro durante la perquisizione, stando a quanto si legge sul verbale. A: 'Where did the police find all the money that belonged to the man killed in the train's bathroom? Next to his body?' B: 'No, it was on the car's floor that lit. was found the money during the inspection, based on what can be read in the minutes'.
Id-P1	Urtare i nervi/il polso	A: Da che cosa siete stati infastiditi mentre stavate guardando il film al cinema? Dal chiacchiericcio della gente? B: No, è per via tutti i cellulari che continuavano a suonare che i nervi ci sono stati urtati e abbiamo deciso di abbandonare la sala. A: 'What were you annoyed by while you were watching the movie at the cinema? By people's chatter?' B: 'No, it was due to all the phones that kept on ringing that the nerves were hurt to us and we decided to leave the room'.
Id-P2	Urtare i nervi/il polso	A: Da che cosa siete stati infastiditi mentre stavate guardando il film al cinema? Dal chiacchiericcio della gente? B: No, è per via tutti i cellulari che continuavano a suonare che ci sono stati urtati i nervi e abbiamo deciso di abbandonare la sala. A: 'What were you annoyed by while you were watching the movie at the cinema? By people's chatter?' B: 'No, it was due to all the phones that kept on ringing that lit. were hurt the nerves to us and we decided to leave the room'.
Lit-P1	Urtare i nervi/il polso	A: Com'è successo che la prima ballerina si sia fratturata il radio durante l'esibizione? Ha sbattuto la mano per terra? B: No, è contro un altro ballerino che stava accanto a lei che il polso è stato urtato con violenza, portandola a fratturarsi l'osso. A: 'How did it happen that the prima ballerina broke the radius during the exhibition? Did she hit her hand on the ground?' B: 'No, it is against another dancer beside her that the wrist was hit violently, causing her to break the bone'.
Lit-P2	Urtare i nervi/il polso	A: Com'è successo che la prima ballerina si sia fratturata il radio durante l'esibizione? Ha sbattuto la mano per terra? B: No, è contro un altro ballerino che stava accanto a lei che è stato urtato il polso con violenza, portandola a fratturarsi l'osso. A: 'How did it happen that the prima ballerina broke the radius during the exhibition? Did she hit her hand on the ground?' B: 'No, it is against another dancer beside her that lit. was hit the wrist violently, causing her to break the bone'.
Id-P1	Vedere le stelle/la rapina	A: Quando Luca è stato ricoverato per appendicite, quale parte è stata più dolorosa? Il decorso post-operatorio? B: No, è stato con l'iniezione spinale prima dell'intervento che le stelle sono state viste per davvero, stando a quanto mi raccontava. A: 'When Luca was hospitalized for appendicitis, what was the most painful part? The post-operative course?' B: 'No, it was with the spinal injection that the stars were seen for real, according to what he told me'.
Id-P2	Vedere le stelle/la rapina	A: Quando Luca è stato ricoverato per appendicite, quale parte è stata più dolorosa? Il decorso post-operatorio? B: No, è stato con l'iniezione spinale prima dell'intervento che sono state viste le stelle per davvero, stando a quanto mi raccontava. A: 'When Luca was hospitalized for appendicitis, what was the most painful part? The post-operative course?' B: 'No, it was with the spinal injection that lit. were seen the stars for real, according to what he told me'.

Lit-P1	Vedere le stelle/la rapina	<p>A: Come sono riusciti gli abitanti del centro ad accorgersi che dei ladri stavano svaligiando la banca? Hanno sentito degli spari?</p> <p>B: No, è stato grazie a un video diffuso su Facebook da un cliente che la rapina è stata vista e hanno potuto chiamare la polizia.</p> <p>A: 'How did people from downtown realize that thieves were robbing the bank? Did they hear gun shots?'</p> <p>B: 'No, it was thanks to the video shared on Facebook by a customer that the robbing was seen and they could call the police'.</p>
Lit-P2	Vedere le stelle/la rapina	<p>A: Come sono riusciti gli abitanti del centro ad accorgersi che dei ladri stavano svaligiando la banca? Hanno sentito degli spari?</p> <p>B: No, è stato grazie a un video diffuso su Facebook da un cliente che è stata vista la rapina e hanno potuto chiamare la polizia.</p> <p>A: 'How did people from downtown realize that thieves were robbing the bank? Did they hear gun shots?'</p> <p>B: 'No, it was thanks to the video shared on Facebook by a customer that lit. was seen the robbing and they could call the police'.</p>
Id-P1	Vuotare il sacco/il pozzo	<p>A: Quando l'imputato ha confessato di aver ucciso la moglie? Al primo interrogatorio?</p> <p>B: No, è stato solo dopo diversi colloqui con gli investigatori che finalmente il sacco è stato vuotato, a quanto dicono i verbali.</p> <p>A: 'When did the defendant confess to killing his wife? During the first interrogation?'</p> <p>B: 'No, it was only after many conversations with the detectives that eventually the sack was emptied, as minutes report'.</p>
Id-P2	Vuotare il sacco/il pozzo	<p>A: Quando l'imputato ha confessato di aver ucciso la moglie? Al primo interrogatorio?</p> <p>B: No, è stato solo dopo diversi colloqui con gli investigatori che finalmente è stato vuotato il sacco, a quanto dicono i verbali.</p> <p>A: 'When did the defendant confess to killing his wife? During the first interrogation?'</p> <p>B: 'No, it was only after many conversations with the detectives that eventually lit. was emptied the sack, as minutes report'.</p>
Lit-P1	Vuotare il sacco/il pozzo	<p>A: Come sono riuscite le aziende ad esaurire la riserva di petrolio che si trovava a sud della città? Lo stavano usando da molti anni?</p> <p>B: No, è stato dopo un periodo di sfruttamento intenso e concentrato che il pozzo è stato vuotato, privando la regione di materie prime.</p> <p>A: 'How did the companies manage to use up the oil reserve south of the city? Had they been using it for many years?'</p> <p>B: 'No, it was after an intense and concentrated exploitation period that the well was emptied, depriving the region of raw materials'.</p>
Lit-P2	Vuotare il sacco/il pozzo	<p>A: Come sono riuscite le aziende ad esaurire la riserva di petrolio che si trovava a sud della città? Lo stavano usando da molti anni?</p> <p>B: No, è stato dopo un periodo di sfruttamento intenso e concentrato che è stato vuotato il pozzo, privando la regione di materie prime.</p> <p>A: 'How did the companies manage to use up the oil reserve south of the city? Had they been using it for many years?'</p> <p>B: 'No, it was after an intense and concentrated exploitation period that lit. was emptied the well, depriving the region of raw materials'.</p>

Appendix C

Models for the first eye-tracking study in Chapter 3

C.1 All Phrases - Final Word: First Fixation Duration

Table C.1: Final Word in Idiom and Literal Phrases: First Fixation Duration (* = $p < .05$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	5.488	.019	288.600	.000***
Trial	.000	.006	.130	.897
AOI Length	.021	.006	3.370	.001***
Cloze	-.000	.000	-2.405	.017*
Idiomaticity	.006	.013	.454	.651
Pass vs Act	-.048	.013	-3.687	.000***
Pass II vs Pass I	.079	.023	3.424	.001***
Idiomaticity \times Pass vs Act	-.017	.025	-.680	.498
Idiomaticity \times Pass II vs Pass I	.000	.037	.017	.986

Random Effects	Variance	SD
Item	.001	.022
Idiomaticity Item	.001	.036
Pass vs Act Item	.002	.043
Pass II vs Pass I Item	.003	.055
Idiomaticity × Pass vs Act Item	.008	.091
Idiomaticity × Pass II vs Pass I Item	.025	.157
Subject	.012	.111
Residual	.066	.256

C.2 All Phrases - Final Word: First Pass Reading Time

Table C.2: Final Word in Idiom and Literal Phrases: First Pass Reading Time (* = $p < .05$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	5.613	.021	269.954	.000***
Trial	-.005	.007	-0.674	.500
AOI Length	.044	.008	5.295	.000***
Cloze	-.001	.000	-2.577	.011*
Idiomaticity	.002	.016	.105	.917
Pass vs Act	-.022	.017	-1.284	.203
Pass II vs Pass I	.024	.028	.839	.402
Idiomaticity × Pass vs Act	.024	.033	.723	.472
Idiomaticity × Pass II vs Pass I	.017	.046	.362	.719

Random Effects	Variance	<i>SD</i>
Item	.001	.029
Idiomaticity Item	.001	.023
Pass vs Act Item	.005	.069
Pass II vs Pass I Item	.002	.039
Idiomaticity × Pass vs Act Item	.016	.125
Idiomaticity × Pass II vs Pass I Item	.034	.185
Subject	.014	.117
Residual	.111	.333

C.3 All Phrases - Final Word: Go-Past Time

Table C.3: Final Word in Idiom and Literal Phrases: Go-Past Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	5.776	.028	202.936	.000***
Trial	-.010	.009	-1.045	.296
AOI Length	.038	.014	2.644	.009**
Cloze	-.000	.000	-1.792	.075
Idiomaticity	-.038	.023	-1.673	.097
Pass vs Act	-.023	.024	-.966	.337
Pass II vs Pass I	.096	.039	2.456	.015*
Idiomaticity × Pass vs Act	.036	.041	.869	.387
Idiomaticity × Pass II vs Pass I	.025	.058	.437	.664

Random Effects	Variance	SD
Item	.008	.091
Idiomaticity Item	.005	.072
Pass vs Act Item	.011	.104
Pass II vs Pass I Item	.012	.108
Idiomaticity × Pass vs Act Item	.019	.139
Idiomaticity × Pass II vs Pass I Item	.046	.214
Subject	.022	.147
Residual	.164	.406

C.4 All Phrases - Final Word: Total Reading Time

Table C.4: Final Word in Idiom and Literal Phrases: Total Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	5.844	.033	175.553	.000***
Trial	-.034	.009	-3.760	.000***
AOI Length	.067	.013	4.949	.000***
Cloze	-.001	.000	-2.749	.007**
Idiomaticity	-.025	.025	-1.008	.317
Pass vs Act	.054	.023	2.331	.023*
Pass II vs Pass I	.101	.037	2.692	.008**
Idiomaticity × Pass vs Act	.048	.037	1.300	.195
Idiomaticity × Pass II vs Pass I	.043	.060	.715	.477

Random Effects	Variance	<i>SD</i>
Item	.013	.116
Idiomaticity Item	.012	.109
Pass vs Act Item	.010	.102
Pass II vs Pass I Item	.007	.086
Idiomaticity × Pass vs Act Item	.004	.060
Idiomaticity × Pass II vs Pass I Item	.072	.269
Subject	.031	.175
Residual	.170	.413

C.5 All Phrases - Final Word: Fixation Count

Table C.5: Final Word in Idiom and Literal Phrases: Fixation Count (** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	z	<i>p</i>
Trial	-.048	.017	-2.807	.005**
AOI Length	.079	.018	4.388	.000***
Cloze	-.002	.001	-1.846	.065
Idiomaticity	-.016	.038	-.425	.671
Pass vs Act	.124	.036	3.446	.001***
Pass II vs Pass I	.089	.064	1.384	.166
Idiomaticity × Pass vs Act	.114	.070	1.640	.101
Idiomaticity × Pass II vs Pass I	.063	.093	.672	.501

Random Effects	Variance	<i>SD</i>
Item	.000	.019
Idiomaticity Item	.000	.010
Pass vs Act Item	.000	.002
Pass II vs Pass I Item	.000	.008
Idiomaticity × Pass vs Act Item	.000	.007
Idiomaticity × Pass II vs Pass I Item	.003	.051
Subject	.045	.212

C.6 All Phrases as AOI: First Fixation Duration

Table C.6: Idiom and Literal Phrases as AOI: First Fixation Duration (***) = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	5.451	.024	224.748	.000***
Trial	.007	.005	1.221	.222
AOI Length	-.011	.010	-1.184	.238
Cloze	.000	.000	1.675	.095
Idiomaticity	-.002	.013	-.114	.910
Pass vs Act	-.007	.020	-.334	.739
Pass II vs Pass I	-.042	.022	-1.949	.052
Idiomaticity × Pass vs Act	-.018	.025	-.723	.472
Idiomaticity × Pass II vs Pass I	.003	.033	.080	.936

Random Effects	Variance	<i>SD</i>
Item	.001	.026
Idiomaticity Item	.002	.043
Pass vs Act Item	.003	.055
Pass II vs Pass I Item	.002	.044
Idiomaticity × Pass vs Act Item	.009	.095
Idiomaticity × Pass II vs Pass I Item	.010	.010
Subject	.021	.147
Residual	.067	.260

C.7 All Phrases as AOI: First Pass Reading Time

Table C.7: Idiom and Literal Phrases as AOI: First Pass Reading Time (***) = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.699	.047	142.223	.000***
Trial	.009	.008	1.232	.218
AOI Length	.086	.017	5.128	.000***
Cloze	.000	.000	.409	.683
Idiomaticity	-.031	.018	-1.709	.090
Pass vs Act	.132	.031	4.228	.000***
Pass II vs Pass I	.003	.033	.082	.935
Idiomaticity × Pass vs Act	.046	.033	1.422	.157
Idiomaticity × Pass II vs Pass I	.047	.046	1.035	.304

Random Effects	Variance	<i>SD</i>
Item	.006	.075
Idiomaticity Item	.002	.043
Pass vs Act Item	.005	.072
Pass II vs Pass I Item	.013	.112
Idiomaticity × Pass vs Act Item	.007	.081
Idiomaticity × Pass II vs Pass I Item	.020	.141
Subject	.082	.287
Residual	.130	.361

C.8 All Phrases as AOI: Go-Past Time

Table C.8: Idiom and Literal Phrases as AOI: Go-Past Time (** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.699	.038	178.497	.000***
Trial	-.016	.006	-2.788	.005**
AOI Length	.075	.015	4.914	.000***
Cloze	.000	.000	.850	.396
Idiomaticity	-.046	.017	-2.681	.009**
Pass vs Act	.098	.027	3.626	.000***
Pass II vs Pass I	.037	.025	1.460	.146
Idiomaticity × Pass vs Act	.050	.029	1.727	.088
Idiomaticity × Pass II vs Pass I	-.006	.037	-.150	.881

Random Effects	Variance	<i>SD</i>
Item	.007	.085
Idiomaticity Item	.006	.080
Pass vs Act Item	.003	.052
Pass II vs Pass I Item	.007	.082
Idiomaticity × Pass vs Act Item	.016	.126
Idiomaticity × Pass II vs Pass I Item	.019	.129
Subject	.051	.227
Residual	.080	.283

C.9 All Phrases as AOI: Total Reading Time

Table C.9: Idiom and Literal Phrases as AOI: Total Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.921	.044	158.468	.000***
Trial	-.038	.006	-6.089	.000***
AOI Length	.070	.018	3.941	.000***
Cloze	-.000	.000	-.117	.907
Idiomaticity	-.042	.019	-2.197	.031*
Pass vs Act	.152	.030	4.980	.000***
Pass II vs Pass I	.083	.027	3.114	.002**
Idiomaticity × Pass vs Act	.077	.029	2.692	.009**
Idiomaticity × Pass II vs Pass I	-.042	.043	-.968	.337

Random Effects	Variance	<i>SD</i>
Item	.011	.105
Idiomaticity Item	.009	.094
Pass vs Act Item	.001	.036
Pass II vs Pass I Item	.007	.084
Idiomaticity × Pass vs Act Item	.011	.103
Idiomaticity × Pass II vs Pass I Item	.039	.198
Subject	.067	.258
Residual	.089	.299

C.10 All Phrases as AOI: Fixation Count

Table C.10: Idiom and Literal Phrases as AOI: Fixation Count (* = $p < .05$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	z	<i>p</i>
Intercept	1.489	.040	36.883	.000***
Trial	-.049	.010	-5.046	.000***
AOI Length	.070	.018	3.900	.000***
Cloze	-.000	.001	-.270	.788
Idiomaticity	-.018	.021	-.860	.390
Pass vs Act	.160	.033	4.690	.000***
Pass II vs Pass I	.071	.038	1.875	.061
Idiomaticity × Pass vs Act	.086	.040	2.138	.033*
Idiomaticity × Pass II vs Pass I	-.054	.053	-1.030	.303

Random Effects	Variance	<i>SD</i>
Item	.003	.057
Idiomaticity Item	.000	.004
Pass vs Act Item	.000	.013
Pass II vs Pass I Item	.000	.028
Idiomaticity × Pass vs Act Item	.000	.001
Idiomaticity × Pass II vs Pass I Item	.039	.198
Subject	.057	.239

C.11 Idioms Only as AOI: First Pass Reading Time

Table C.11: Idiom Phrases as AOI: First Pass Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.669	.050	134.620	.000***
Trial	.002	.010	.169	.865
AOI Length	.082	.022	3.824	.000***
Cloze	.000	.000	1.831	.069
Familiarity	-.052	.019	-2.746	.008**
Meaning Knowledge	.037	.019	1.900	.062
Pass vs Act	.177	.042	4.206	.000***
Pass II vs Pass I	.037	.043	.840	.402
Familiarity × Pass vs Act	.021	.023	.915	.363
Familiarity × Pass II vs Pass I	-.105	.035	-3.034	.003**

Random Effects	Variance	<i>SD</i>
Item	.006	.076
Pass vs Act Item	.005	.072
Pass II vs Pass I Item	.020	.143
Subject	.085	.292
Residual	.117	.342

C.12 Idioms Only as AOI: Go-Past Time

Table C.12: Idiom Phrases as AOI: Go-Past Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.773	.040	170.134	.000***
Trial	-.021	.008	-2.628	.009**
AOI Length	.072	.018	3.954	.000***
Cloze	.000	.000	1.417	.159
Familiarity	-.043	.013	-3.206	.002**
Transparency	-.023	.013	-1.776	.081
Pass vs Act	.134	.034	3.903	.000***
Pass II vs Pass I	.041	.032	1.298	.196
Familiarity \times Pass vs Act	.005	.017	.311	.756
Familiarity \times Pass II vs Pass I	-.087	.024	-3.649	0.001***
Transparency \times Pass vs Act	-.034	.017	-1.989	0.048*
Transparency \times Pass II vs Pass I	.041	.024	1.690	.096

Random Effects	Variance	<i>SD</i>
Item	.005	.074
Pass vs Act Item	.001	.031
Pass II vs Pass I Item	.002	.046
Subject	.054	.232
Residual	.075	.274

C.13 Idioms Only as AOI: Total Reading Time

Table C.13: Idiom Phrases as AOI: Total Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	6.886	.047	146.229	.000***
Trial	-.052	.009	-5.915	.000***
AOI Length	.069	.021	3.238	.002**
Cloze	.000	.000	1.204	.231
Familiarity	-.066	.016	-4.069	.000***
Transparency	-.019	.016	-1.243	.219
Pass vs Act	.203	.039	5.190	.000***
Pass II vs Pass I	.073	.038	1.916	.057
Familiarity \times Pass vs Act	-.011	.018	-.597	.551
Familiarity \times Pass II vs Pass I	-.064	.030	-2.098	.041*
Transparency \times Pass vs Act	-.053	.018	-2.943	.003**
Transparency \times Pass II vs Pass I	.011	.031	.364	.717

Random Effects	Variance	<i>SD</i>
Item	.009	.096
Pass vs Act Item	.000	.012
Pass II vs Pass I Item	.018	.134
Subject	.075	.274
Residual	.088	.297

C.14 Idioms Only as AOI: Fixation Count

Table C.14: Idiom Phrases as AOI: Fixation Count (* = $p < .05$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	z	<i>p</i>
Intercept	1.467	.043	33.768	.000***
Trial	-.075	.014	-5.363	.000***
AOI Length	.056	.022	2.570	.010*
Cloze	.001	.001	.946	.344
Familiarity	-.061	.015	-4.100	.000***
Transparency	-.024	.014	-1.697	.090
Pass vs Act	.236	.046	5.132	.000***
Pass II vs Pass I	.045	.052	.860	.390
Familiarity \times Pass vs Act	-.002	.029	-.059	.953
Familiarity \times Pass II vs Pass I	-.040	.037	-1.064	0.287
Transparency \times Pass vs Act	-.059	.029	-2.065	.039*
Transparency \times Pass II vs Pass I	.008	.037	.213	.831

Random Effects	Variance	<i>SD</i>
Item	.000	.005
Pass vs Act Item	.000	.004
Pass II vs Pass I Item	.000	.007
Subject	.062	.248

Appendix D

Models for the second eye-tracking study in Chapter 3

D.1 Idioms - Final Word: First Fixation Duration

Table D.1: Final Word in Idioms: First Fixation Duration (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	241.197	6.144	39.257	.000***
Trial	-4.737	1.702	-2.783	.005**
AOI Position	-1.903	1.860	-1.023	.311
AOI Length	5.174	2.196	2.357	.020*
Cloze	-.099	.064	-1.548	.125
Pass I vs Pass II	-20.268	4.937	-4.105	.000***

Random Effects	Variance	<i>SD</i>
Item	42.950	6.554
Pass I vs Pass II Item	368.690	19.201
Subject	548.230	23.414
Pass I vs Pass II Subject	80.710	8.984
Residual	4332.820	65.824

D.2 Idioms - Final Word: First Pass Reading Time

Table D.2: Final Word in Idioms: First Pass Reading Time (***) = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	297.677	18.597	16.006	.000***
Trial	-3.659	2.444	-1.497	.135
AOI Position	-.401	3.529	-.114	.910
AOI Length	16.075	3.386	4.748	.000***
Cloze	-.042	.097	-.434	.665
Meaning Knowledge	-.325	.192	-1.694	.096
Pass I vs Pass II	-48.802	24.422	-1.998	.051
Meaning Knowledge \times Pass I vs Pass II	.497	.265	1.876	.067

Random Effects	Variance	<i>SD</i>
Item	374.910	19.363
Pass I vs Pass II Item	62.960	7.935
Subject	1174.930	34.277
Pass I vs Pass II Subject	50.030	7.073
Residual	8845.810	94.052

D.3 Idioms - Final Word: Go-Past Time

Table D.3: Final Word in Idioms: Go-Past Time (* = $p < .05$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	2627.712	283.302	9.275	.000***
Trial	-206.528	22.039	-9.371	.000***
AOI Position	-385.795	43.480	-8.873	.000***
AOI Length	11.362	33.486	.339	.735
Cloze	-.905	.991	-.913	.362
Familiarity	95.994	56.538	1.698	.095
Meaning Knowledge	-7.098	2.935	-2.419	.019*
Pass I vs Pass II	52.242	53.516	.976	.329

Random Effects	Variance	SD
Item	81042.500	284.68
Pass I vs Pass II Item	309.100	17.580
Subject	168034.500	409.920
Pass I vs Pass II Subject	141.400	11.890
Residual	709709.100	842.440

D.4 Idioms - Final Word: Total Reading Time

Table D.4: Final Word in Idioms: Total Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	414.244	24.615	16.829	.000***
Trial	-17.522	3.588	-4.884	.000***
AOI Position	4.622	4.560	1.014	.315
AOI Length	30.912	5.032	6.144	.000***
Cloze	-.321	.150	-2.145	.034*
Meaning Knowledge	-.687	.254	-2.703	.009**
Pass I vs Pass II	-7.102	10.877	-.653	.517

Random Effects	Variance	SD
Item	523.700	22.880
Pass I vs Pass II Item	1649.300	40.610
Subject	1996.100	44.680
Pass I vs Pass II Subject	576.400	24.010
Residual	19014.200	137.890

D.5 Idioms - Final Word: Fixation Count

Table D.5: Final Word in Idioms: Fixation Count (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	SE	z	<i>p</i>
Intercept	.487	.102	4.790	.000***
Trial	-.056	.021	-2.723	.006**
AOI Position	.015	.021	.696	.486
AOI Length	.163	.023	7.048	.000***
Cloze	-.000	.001	-.400	.689
Meaning Knowledge	-.003	.001	-2.277	.023*
Pass I vs Pass II	.042	.047	.885	.376

Random Effects	Variance	SD
Item	.000	.000
Pass I vs Pass II Item	.000	.000
Subject	.009	.096
Pass I vs Pass II Subject	.000	.011

D.6 Idiom Phrases as AOI: First Fixation Duration

Table D.6: Idiom Phrases as AOI: First Fixation Duration (** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	229.226	5.100	38.206	.000***
Trial	-1.945	1.391	-1.398	.162
AOI Position	1.518	1.943	.778	.440
AOI Length	-.632	1.938	-.326	.746
Cloze	-.053	.057	-.942	.348
Pass I vs Pass II	9.678	3.394	2.851	.006**

Random Effects	Variance	SD
Item	108.170	10.400
Pass I vs Pass II Item	126.640	11.253
Subject	597.390	24.441
Pass I vs Pass II Subject	37.980	6.163
Residual	3242.700	56.945

D.7 Idiom Phrases as AOI: First Pass Reading Time

Table D.7: Idiom Phrases as AOI: First Pass Reading Time (** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	SE	t	p
Intercept	732.479	43.021	17.026	.000***
Trial	-16.962	9.024	-1.880	.060
AOI Position	-23.745	18.098	-1.312	.195
AOI Length	11.863	18.064	.657	.514
Cloze	.932	.417	2.239	.026*
Familiarity	-43.947	18.912	-2.324	.024*
Literal Plausibility	.258	18.410	.014	.989
Pass I vs Pass II	53.629	18.781	2.855	.004**
Familiarity \times Pass I vs Pass II	30.198	18.347	1.646	.100
Literal Plausibility \times Pass I vs Pass II	-53.429	18.437	-2.898	.004**

Random Effects	Variance	SD
Item	12940	113.769
Pass I vs Pass II Item	7.021	2.650
Subject	26540	162.896
Pass I vs Pass II Subject	59.790	7.733
Residual	138000	371.548

D.8 Idiom Phrases as AOI: Go-Past Time

Table D.8: Idiom Phrases as AOI: Go-Past Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	1206.743	83.267	14.493	.000***
Trial	-45.474	15.324	-2.967	.003**
AOI Position	24.833	36.312	.684	.497
AOI Length	147.812	36.879	4.008	.000***
Cloze	.239	1.020	.234	.815
Familiarity	-77.1702	39.585	-1.949	.056
Transparency	-58.126	36.149	-1.608	.114
Pass I vs Pass II	70.232	51.238	1.371	.176
Familiarity \times Pass I vs Pass II	-100.907	49.806	-2.026	.048*

Random Effects	Variance	<i>SD</i>
Item	64570.600	254.110
Pass I vs Pass II Item	89808.005	299.680
Subject	48288.500	219.750
Pass I vs Pass II Subject	810.200	28.460
Residual	378825.200	615.490

D.9 Idiom Phrases as AOI: Total Reading Time

Table D.9: Idiom Phrases as AOI: Total Reading Time (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	1018.873	43.725	23.302	.000***
Trial	-72.379	7.603	-9.519	.000***
AOI Position	-7.302	15.142	-.482	.632
AOI Length	68.382	15.481	4.417	.000***
Cloze	.559	.346	1.618	.106
Familiarity	-56.306	16.053	-3.508	.001***
Transparency	-39.340	15.412	-2.553	.014*
Pass I vs Pass II	59.343	16.090	3.688	.000***
Transparency \times Pass I vs Pass II	-33.938	15.397	-2.204	.028*

Random Effects	Variance	<i>SD</i>
Item	10466.400	102.310
Pass I vs Pass II Item	622.800	24.960
Subject	36568.800	191.230
Pass I vs Pass II Subject	103.800	10.190
Residual	95689.300	309.340

D.10 Idiom Phrases as AOI: Fixation Count

Table D.10: Idiom Phrases as AOI: Fixation Count (* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

Fixed Effects	β	<i>SE</i>	<i>z</i>	<i>p</i>
Intercept	1.501	.037	40.220	.000***
Trial	-.066	.011	-5.846	.000***
AOI Position	-.006	.012	-.540	.589
AOI Length	.068	.012	5.655	.000***
Cloze	.000	.000	.416	.678
Familiarity	-.042	.013	-3.206	.001**
Transparency	-.032	.012	-2.700	.007**
Pass I vs Pass II	.034	.023	1.473	.141

Random Effects	Variance	<i>SD</i>
Item	.000	.027
Pass I vs Pass II Item	.000	.002
Subject	.019	.137
Pass I vs Pass II Subject	.000	.009

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