The Processing of Fixed Expressions during Sentence Comprehension¹

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1. Fixed Expressions - issues of representation and processing

Understanding language involves recognition and access to not only individual words, but also to a vast array of fixed expressions - idioms, collocations, proverbs, common quotations, names, titles, slogans, song lyrics, etc. The purpose of the present paper is to examine the question of how fixed expressions - particularly those with non-literal interpretations - are understood during on-line sentence comprehension. The work we present examines cases of both truly fixed expressions and those which are deemed somewhat more malleable but still `idiomatic', with a focus on the processing of these expressions in a language that has a highly productive (active) use of word collocation, particularly for compounds - German. We begin by outlining some general assumptions and issues underlying our work.

To begin with, there is no clear ground upon which to firmly establish definitions of what constitutes a purely 'literal' vs. 'figurative' (non-literal) expression. Such definition ultimately awaits a monolithic (universal and correct) theory of semantics/syntax. Similarly, distinguishing what are truly fixed expressions vs. expressions with some productive

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features vs. expressions that are highly productive and malleable is equally problematic and also awaits a universally descriptive theory of language. However, the cases we deal with in the research presented below do not fall on the grey areas of any such descriptive generalizations - we use cases for which there will be wide agreement (backed by empirical data) as to the degree of non-literal and fixedness of interpretation, and we take such clear cases to be important end points in developing a processing theory of figurative expressions. Thus, while we acknowledge the ongoing tension between approaches that hold that 'literal' and 'metaphoric/figurative' processes are different processing types vs. simply different endpoints on a single continuum of processing, (see, e.g., Clark, 1978; Gibbs, 1984; Lehrer, 1974; Newmeyer, 1972; Weinreich, 1967 for variations on such approaches) the work we present is intended to be independent of either viewpoint (although it is designed to illuminate the debate).

Similarly, while much literature has debated the degree of (de)compositionality (or, 'frozenness') inherent in idioms (see, e.g., Fraser, 1974; Gibbs and Nayak, 1989; Heringer, 1976), we accept the problem of heterogeneity among 'non-literal' expressions with regard to current linguistic compositional theory - our approach is independent of (but, again, may shed light on) the resolution of such issues.

One traditional way in which non-literal (figurative) expressions have been treated is as merely one of a heterogeneous bundle of pragmatic phenomenon that are stored and computed outside of 'standard language processing' per se (see, e.g., Katz & Fodor, 1963). This view of metaphoric processing has been extended by some theoreticians to include figurative expressions that have become fixed forms (idioms) in the language. Other approaches have assumed such fixed-form expressions to have a representation all their own (whether as part of the language system or not; e.g., Bobrow & Bell, 1973). Still other approaches have assumed that fixed-form expressions, whether literal or figurative in interpretation, are simply lexical entries precisely like those assumed for standard literal interpretation of individual words (see, e.g., Di Sciullo & Williams, 1987; Swinney & Cutler, 1979). Our work is designed to examine certain aspects of this issue.

Finally, in its simplest description, a fixed figurative expression (for simplicity, the term 'idiom' will be used hereafter to refer to such an expression) is a string of words for which the interpretation is not (entirely) derived from the individual meanings of the words comprising the string (even if there can be seen some historical linkage of the literal words to the overall expression). Further, this non-literal interpretation has become 'fixed' in the language by use. Thus, the idiom 'trip the light fantastic'

(meaning, roughly, 'to dance') has little relationship to the current individual meanings of the words in that phrase. The work we present in this paper concerns word compounds that have idiomatic meaning. The work will be focused on idiomatic compounds in German, a language which, in contrast to English, has a highly productive use of compounding in natural language. Thus, the study of these forms in German provides a strong laboratory for examining the operation of a processing device that must deal with both highly literal and highly non-literal compounding of words on a regular basis. We note here that, as in all idioms, an idiom compound's meaning may be: a) entirely independent from the `literal' meanings of the individual words in the compound, or b) partially related to one of the 'literal' meanings of the compound via either structural or semantic analysis, or c) entirely ambiguous - having both a `literal' and a 'figurative' meaning. Consider, for example, the English compound `redhead'. This has the structurally decomposable literal meaning involving a head that is red in color (perhaps from sunburn or dye), the partially decomposable meaning of 'having hair that is red', and the non-decomposable figurative meaning of 'hot tempered' - a meaning derivable only by 'knowledge' of personality features stereotypically associated with persons who have red-hair. The latter meaning has come to be 'fixed' by use - and is thus idiomatic. Consider also the English compound 'horse-laugh'. With the exception of the small class of individuals who deal closely with horses (and who might attribute the human descriptor of laughter to a horse) there is no literal (decomposable or otherwise) interpretation of this compound. Yet the fixed idiom is easily understood to mean a loud annoying (braying) laugh by a human. Overall, we are not primarily concerned here with the compositional origins of a metaphoric derivation of these fixed forms, but we note that it is clear that no single concept of (de)composition will easily work in describing interpretation for such a variety of forms (see, e.g., Lehnert, 1986). Relatedly, we want to note that neither representation nor processing of putatively compositional lexical concepts necessarily induces more computational costs than non-decompositional ones (see, e.g., Fodor, Fodor, & Garrett, 1975; Fodor, Garrett, Walker, & Parkes, 1980), and thus measures of processing load, per se, will not be sufficient to differentiate processing models concerning such entities. It will, rather, take direct evidence about the activation (or lack thereof) of various non-literal and literal meanings of individual (and joint) elements in the compounds - and the time-course of their activations - to distinguish among such models. The present work is focused on providing an analysis of the computational processes involved in the interpretation of fixed compound expressions during sentence processing, using on-line measures that are sensitive to the

temporal constraints of sentence processing, and which reveal activation of individual words and concepts during such processing.

2 Idiom Processing Accounts

There are two broadly differing accounts of idiom processing, accounts that might best be distinguished as 'literal-meaning-dependent' vs. 'literalmeaning-independent' models. The former all hold that access to idiomatic meanings is, in one way or another, tied to an attempted literal analysis of the items comprising the idiom. In some approaches, this takes the form of a claim that the perceiver accesses first the literal meaning(s) of the words the idiom is composed of before s/he accesses the non-literal (idiomatic) meaning (e.g., Clark & Lucy, 1975; Fraser, 1970; Weinreich, 1967). In a related approach, it is assumed that there is a separate 'idiom list' (perhaps outside of the lexicon) which will be accessed when the processing of a literal interpretation fails (e.g., Bobrow & Bell, 1973). All approaches within this model essentially assert a form of two-stage serial access/processing in which the idiomatic interpretation is achieved only in the second stage. In some cases this two-stage processes is viewed as cascaded (somewhat temporally overlapping), but in all such models, some temporal distinctions between initial literal analysis and later idiomatic analysis all hold. In this approach, idioms are treated much as non-fixed figurative language forms would be.

There are also several types of literal-meaning-independent hypotheses about idiom processing that have been proposed. A "multiple access hypothesis" or "lexical representation hypothesis" holds that idiomatic and literal meanings of words and word compounds are simultaneously activated upon encountering the idiom (see, e.g., Swinney & Cutler, 1979). In this, idioms are simply large (multi-segment) words stored in the lexicon much as meaning is stored for any word. Given that the lexical ambiguity literature provides strong evidence that all meanings associated with a word are accessed upon encountering the `form' of the word (e.g., Ahrens, 1998; Seidenberg, Tanenhaus, Leiman and Bienkowski, 1982; Swinney, 1979, among others), the idiom meaning is accessed along with the other meanings of words - based on complete identification of the form of the word.

In a somewhat different but related view, the "direct access hypothesis" holds that linguistic analysis can be completely bypassed if the perceiver immediately recognizes the relevant expression as an idiom (Gibbs, 1980; 1984; 1986). This approach does not specify whether this is

considered to be lexical access or not, and it has variants in which semantic and syntactic aspects of idiom use can be considered in the access process. The latter are "idiom decomposition approaches" in which a perceiver analyzes decomposable idioms by accessing first the figurative meaning of parts of the idioms. For example, in interpreting the idiom "pop the question" the perceiver is would access the figurative meanings of "pop" (suddenly utter) and "the question" (marriage proposal) and interpret the entire idiom from these (e.g., Gibbs, Nayak, & Cutting, 1989).

Overall, both off-line as well as on-line processing evidence has tended to support the literal-meaning-independent accounts over the literal-meaning-dependent approaches, largely via evidence that access to the idiomatic meaning takes either about the same time as (or is even faster than) access to the literal counterpart of the expression (e.g., Gibbs, 1980; 1986; Ortony, Schallert, Reynolds & Antos, 1978; Swinney & Cutler, 1979). (Note, this is a considerably different model than the evidence about non-idiomatic figurative language processing supports - but that is not the issue of relevance here.) Clearly such evidence is highly dependent on a clear understanding of the experimental methods applied to studies of idiom processing, and we examine such concerns below. However, overall, there is considerable evidence that idiomatic meanings are not made available any less rapidly than literal interpretations of these words, a fact that can only be taken as support for the literal-meaning-in dependent models.

For example, Gibbs et al. (1989) have examined processing for three types of idioms (normal, abnormally decomposable idioms and nondecomposable idioms) in a reaction time study. The example "pop the question" is considered to be a normal decomposable idiom as each part contributes to the overall meaning of the idiom; in contrast, "to carry a torch" would be an abnormal decomposable idiom because only one part ("torch") would express a figurative relationship ("warm feelings"); and, independent from etymological considerations, the parts of nondecomposable idioms appear not to contribute the idiomatic meaning directly at all (e.g., "to chew the fat"). Exemplars of these idiom types were visually to subjects who were asked (acceptable/unacceptable judgements) such phrases, along with their literal counterparts (e.g.," ask the question', "light the torch"). It was found that decomposable (normal and abnormal) idioms were verified faster than their literal counterparts, thus leading the authors to support a literal-meaningindependent model in which idioms do not need to be analyzed into their literal readings. In this study it was found that the non-decomposable idioms were verified significantly slower than their literal control phrases. This and similar findings have often been argued to demonstrate that

subjects would perform a compositional analysis on the idiomatic word strings to determine their figurative meaning, and their attempt (and inability) to do so causes slower processing. However, such an interpretation of these interesting results may not have sufficiently considered critical methodological aspects of the task used. Note that the "idiom phrases" in such studies are read by subjects in isolation, out of sentential context. After seeing a large number of items which are compositional (2/3 of the experimental materials and all of the matched controls) and being required to make a conscious decision about each of them, it appears highly likely that subjects will tend toward a conscious 'compositional analysis' mode of evaluating these short phrases. Such conscious processing, however, is most likely to take place only subsequent to actual unconscious comprehension of the phrases. Thus, it may simply be that finding something unusual (e.g., the few non-decomposable items) in this list causes the conscious processing and analysis of these expressions to 'hiccup' (so to speak), and make for longer conscious decisions. In general, isolated phrase verification techniques of this type can lead to many specialized strategies that are not used in normal language understanding, a point which leaves unanswered the question of how such materials are processed during normal language comprehension. We strongly feel that the existing evidence suggests that more sensitive tasks - particularly those which do not cause conscious introspection about the stimulus materials in question - need to be utilized in order to provide stable answers to these fundamental questions underlying sentence comprehension. (for more detailed arguments and evidence concerning methodology see: Nicol, Fodor, Swinney, 1994, Fodor, 1995; Nicol & Swinney, 1989; Swinney, 1981).

There are a few studies which have applied sensitive and non-consciously introspective on-line paradigms to the examination of how idiomatic phrases are processed during sentence comprehension (see, e.g., Cacciari & Tabossi, 1988; Colombo, 1993; 1998; Swinney, 1981; Tabossi & Zardon, 1993; 1995; Titone & Connine, 1994). Most of these have used a cross-modal-lexical-priming methodology (CMLP); Swinney, Onifer, Prather & Hirshkowitz, 1979; Swinney, 1979; Swinney, 1981) in which subjects are presented auditorily with sentences (or larger discourse units) containing idioms, and at selected points while the idiom is being heard, a visual `target' appears on a screen to which subjects make a binary decision (usually: word/non-word) or 'name' it. The visual target is a word that is semantically/associatedly related to either a part of the idiom (e.g., a literal word occurring in the idiom) or to the figurative meaning of the idiom overall. (Necessarily, the target may also be a `control' word which is unrelated to any part of the idiom, but matched to the `associated' word on

all other grounds - frequency, concreteness, etc. - or it may be a non-word letter string if the task involves a lexical decision). Decision reaction times to 'classify' the visual target (word/non-word) or `name' the visual target are recorded. When priming (speeded responses to the associated word vs. the control word) is found, it is taken as evidence that the 'associated material' in the idiom has been accessed and is available to 'prime' the decision made to the target word. Such priming, where found, constitutes prima facia evidence for access and activation of various aspects of the phrase comprising the idiom in the sentence. Even with use of these techniques, however, there is disagreement over the nature of the process by which idioms are comprehended.

Swinney (1981) for example, used CMLP to examine access to idiomatic meanings in sentence contexts, probing at the offset of the first word and last word of a 'grammatical idiomatic phrase' (one with both literal and idiomatic interpretations) which occurred in the middle of a sentence. Consider, for example, the phrase "kick the bucket". Swinney found that target words related to the literal meaning of the first word ('kick') were primed at the offset of that word but not at the offset of the last word in the idiom ("bucket"). Further, he reported finding priming for the overall idiomatic meaning ("die") at the offset of the idiom phrase (at "bucket" but not at the offset of "kick"). It was argued from this that literal meanings of idioms are always accessed along with idiomatic meanings (at least for 'grammatical' idioms). This evidence was also argued to demonstrate that the cohort model of lexical access proposed by Marslen-Wilson and Tyler (1976) is not, at the least, comprehensive, in that it does not accurately describe access to lexicalized idiom meanings. (Under the cohort model the entire idiomatic word meaning (die) should have been accessed from the initial consonant-vowel cluster of "lki...1" (in kick)).

In fact, Titone and Connine (1994) interpreted the above finding as evidence against a lexical-representation model for idioms because of the failure to find priming for the idiom meaning at the offset of the <u>first</u> word of the idiom phrase. Their reasoning however, hinges on a belief that the cohort model of lexical access is correct (namely, that all meanings for all words having an initial consonant-vowel cluster will be accessed when that cluster is heard), a prediction that has not been universally supported in the literature for simple words, much less for multi-segmental words such as idioms. In fact, the Swinney (1981) evidence stands against the cohort model as an overall account of lexical access. The issue here really is one of what constitutes the basis for lexical access - the first consonant cluster, the initial syllable (e.g., Foss and Swinney, 1973) the first stressed syllable (e.g., Cutler & Norris, 1988), the entire form of the word (Swinney, 1981), the

basic orthographic syllable (Taft and Forster, 1975) or some other access unit?. The answer is simply not definitively known at this time. Certainly, however, the Swinney data do not in any way stand against the notion that idioms are stored and accessed as words from the lexicon; the data, however, do not tell precisely how lexical access takes place, and thus do not directly support a lexical representation account (see, however, work by Cutler & Swinney, 1979). The data do suggest that, at least for grammatical idioms, a literal analysis is attempted along with whatever constitutes idiomatic processing.

Cacciari & Tabossi, 1988, Cacciari & Glucksberg, 1991, and Titone & Connine, 1994, have proposed a "configuration model" of idioms processing, which holds that idiom meaning is not a separate lexical entry but is meaning 'associated with a particular configuration of the words', a meaning which is accessed only when the perceiver encounters an "idiom key" in a phrase. An idiom 'key' is a portion of an idiom that allows access to this idiomatic meaning. Consider, for example, the idiom "kick the bucket" The idiom interpretation of this phrase is more frequent than that for its literal counterpart and thus, it is argued that hearing the initial part of the phrase ("kick the...") will more likely lead to an association and completion with the word 'bucket' than (for example) with the word 'ball'. This 'idiom key' / 'configuration' model is clearly a type of literal-meaning-dependent model, but one which holds as a central tenant the assumption that language processing takes place via use of associative prediction.

Cacciari and Tabossi (1988), for example used a modified CMP (cross modal priming) task to examine online access to 'predictable' idiomatic phrases in Italian. 'Predictable' in this case means that the first words of the idiom indicate/suggest the figurative meaning. In an initial study, they probed for activation of words related to the idiomatic and literal meaning of the idiom at the offset of the idiomatic phrase (e.g., "I ragazzo pensava the suo fratello fosse nato con la camicia₁"; vt. "The boy believed that his brother was born with the shirt"; tr. "The boy believed that his brother was born with a silver spoon in his mouth"). Cacciari and Tabossi reported that they found priming only for the idiomatic meaning but not for the literal meaning at the end of sentence probe point. In interpreting these data, we want to emphasize that the test point in this study was at the end of the sentence/trial, a point that is standardly avoided in most CMLP studies precisely because of sentential/trial 'wrap-up', 'reconsideration' and `conscious interpretation' effects that come in at this point. (See e.g., discussions in Swinney, 1981; Swinney, D., Nicol, J., Love, T., & Hald, L.,1999; Balogh, J., Zurif, E., Prather, P., Swinney, D. and Finkel, L.,1998 on many of these issues). Other potential problematic issues in the interpretation of this study concerns the matching of target words in this study (which need to be matched, among other things, for a-priori reaction times independently of the study being performed; see, e.g., Borsky & Shapiro, 1998; Hillert, 1997 for related issues). However, ignoring all of these concerns, we note that the effect of priming between literal and control probes reached reliability at p<.08, but was treated in this study as neither significant nor informative. This effect was not only strongly in the correct direction, but of sufficient strength that there is high likelihood of a Type II statistical error being made if the effect is discounted. Thus, although it stands against 'configurational' hypothesis, it appears that the literal meanings are likely activated in these material conditions, thus supporting a multiple-access model. In a second study involving low-predictable idioms Cacciari and Tabossi report significant priming only for the literal meaning of the idiom, although, again, a strong trend (p<.09) for significance of the idiomatic meaning was effectively discounted. Prudence suggests that such a strong trend should not be dismissed without better cause. A third study which had a 300ms delay between offset of the idiom and the target probe found priming for both literal and idiomatic meanings. Thus, it appears that all meanings of the idioms - literal or figurative - were eventually accessed in these studies, thus supporting a multiple-access hypothesis in some form. The question remains, however, as to the precise time course of the availability of each of the literal and idiomatic interpretations during comprehension.

In addition to the lack of robust evidence about the nature of the operations involved in the processing of idioms, a number of important overarching issues remain that are of concern. For example, the existing studies of sensitive, on-line examination of idiom processing have all taken place only on a limited number of languages; English and Italian are hardly representative of the range of language structures and processes that a universal theory of figurative language (even fixed figurative language) processing needs to consider. Further, the range of idiomatic structures which have been examined is extremely limited - limited enough that significant generalizations may easily be missed, even if all of the data were in agreement. In what follows, we describe new evidence that is intended to move in a direction to correct these holes in the empirical literature.

3 Idiomatic compounds

Languages significantly differ with respect to the degree of lexical composition. For example, English and Chinese prefer single words to compounded words while German tends to use (and create) compounds of great length and complexity with high frequency. Although in Standard

European Languages (SEL) 80-90 percent of nominal compounds contain only two-elements, German has a relatively high percentage of compounds that consist of more than two elements. An example that can be relatively easily parsed by a native German speaker is the following: Tonnentaschenfederkernmatratzenladenverkaufspreisetikett (wherein the individual parts of the compound are: Tonnen + taschen + feder + kern + matratzen + laden + verkaufs + preis + etikett; vt.: Tons + bags + feather + pit + mattress + shop + selling + price + sticker). At least in SEL it is a general rule that the second element of a nominal compound (head) dominates the first element (as it does in English, typically; e.g., "shrimpboat" is a type of boat). For example, in "Bienenhonig" (bee-honey) the head "+honig" can be analyzed as the head and first element "Biene+" as the modifier/subject (honey produced by bees); conversely, in "Honigbiene" (honey-bee) the head "+biene" is the head and the first element "Honig+" is the descriptor/modifier (Bees of a type that produce honey). In German, adult speakers actively use/create novel compounds metaphorically and apply a 'literal' compositional strategy (e.g., "Peter sucht sich Wortblumen fii'r den StrauB seiner Rede"; vt. Peter is looking for word-flowers for the bouquet of his speech). Similarly, children often create new words to describe an object for which they have not yet acquired an existing word (e.g., "Wolkenwasser" (clouds-water) instead of "Regen" (rain)), and second language speakers actively (de)compose foreign words to create(understand) new meaning. (e.g., "sky-scrapper" are "clouds-scrapper" (Wolkenkratzer) in German).

In German there are also a very large number of compounds with idiomatic meanings. For these, a speaker typically cannot apply a decompositional strategy to understand the idiomatic meaning. As with most phrasal idioms, in German, some idiomatic compounds assign only an idiomatic meaning but no literal meaning. For example, "Lampenfieber" (vt: lamp-feaver; in English: 'stage-fright') has no literal counterpart. However, "Eselsohren" (vt. donkey's ears; idiomatic: dog's ear) does have a literal counterpart (i.e., 'donkey's ears' are real things). The range of idiom compounds is enormous - and they represent a particularly vexing problem for models of language processing in a highly compound-productive language such as German to account for. It is precisely in this domain, however, that we feel we can most profitably examine the time course and nature of idiom processing.

4 On-line examination of idiom compound processing in German

The initial work we report here examined the time course of access to the literal and idiomatic meaning of German nominal compounds during auditory sentence processing. The CMLP paradigm was employed throughout.

In an initial study examining whether idiom and literal interpretations of an idiom compound would be activated during comprehension, we conducted an experiment which examined ambiguous compounds (compounds with both a literal and an idiomatic interpretation) such as "Bienenstich" (literal meaning: bee-sting; idiomatic meaning: a particular cake) in a sentence context biased toward the idiomatic interpretation ("Zu Weihnachten backte die Mutter stets einen Bienenstich and einen Stollen'; vt. At Christmas baked the Mother always a "bee-sting" and a fruit loaf.) Target words related to the idiomatic meaning (KUCFEN) and the literal meaning (HONIG) appeared at the offset of the idiom in the sentence. Mean reaction times for 50 native German speaking subjects (who saw only a single probe with the sentence for each exemplar) can be seen in Table 1.

Table 1. Priming pattern (mean difference of reaction time to control related targets) for ambiguous idiomatic compounds in literal and idiomatic biasing contexts.

Idiomatic Meaning	82 msecs.		
Literal Meaning	18 msecs		

The priming effect for both the idiomatic-related target (p<01) and the literal-related target (p<.06) were sufficiently strong to support the argument that both the literal and idiomatic interpretations of these ambiguous idioms were accessed in this study, even in the presence of a context biased only toward the (more frequent) idiomatic interpretation.

A second study was run to examine a dramatically stronger case - that of the processing of idiomatic compounds which only have idiomatic interpretations (idioms with no literal meaning) such as "Ohrwurm" (vt. earworm; approximate English meaning: music). These idioms have fixed meanings and are frequently used in everyday German conversation. In this

study such idiomatic compounds were presented in a neutral sentence context. For example, the sentence: "Beim Einkaufen unserer Lebensmittel muBten wir den Ohrwurm aus den Lautsprechern horen" (vt. "While shopping our groceries had we the 'ear-worm' listen from the speakers") provided a `neutral' or unbiased context at least until after the idiom was heard and after the target probe was responded to. At the offset of the idiom compound we probed for activation the idiomatic meaning (MUSIK) and for activation of the literal meaning of the head noun in the idiom with visually presented target words (along with appropriately matched control target words at the same position). As in the previous study, this experiment was designed so that no subject hear/saw more than one probe/target with any exemplar sentence. The mean reaction-times of fifty native German speakers to the idiomatic and literal meanings of (elements of) this idiom in each context condition can be seen in Table 2.

Table 2. Priming pattern (mean difference of reaction time to control - related targets) for idiomatic compounds with no literal interpretation

Idiomatic	99 msecs.	
Meaning		
Literal	67 msecs	
Meaning		

We found significant priming (p<.Ol) for both idiomatic and literal interpretations in the `neutrally' biased context. These results seem to strongly support the interpretation the literal meaning of the head noun of these idiom-only compounds was accessed when the idiom was heard. Thus was so in spite of the fact that there was no possible literal interpretation for this compound. These data argue strongly for a multiple meaning activation model of idioms, at least in the processing of German compounds.

The outcome of both experiments together demonstrate that both idiomatic meaning and literal meanings of words comprising idiom compounds in German appear to be immediately activated when the idiom is heard during sentence comprehension. This strongly suggests that fixed

meaning phrases act in much the same way as do lexical ambiguities - all meanings associated with the form of the word(s) are accessed automatically and exhaustively.

4.0 Conclusions

The research presented here, combined with prior work in the literature, suggests strongly that fixed form expressions are processed in a manner consistent with the literal-meaning-independent general models of idiom processing. Moreover, they support a 'multiple-form-driven-access version of such models (all meanings - both idiom and literal - are accessed). The evidence we present does not demonstrate any particular. support for an idiom-key or configurational role in such access, and it is completely consistent with an account which holds that fixed idiomatic meanings are lexically represented. The current evidence provides no basis for speculation about a (de)compositional procedure involved in such access, but we note that we only examined one particular idiom type in our work - compounds). Finally, there is no evidence in our work supportive of an anticipatorypredictive process in the comprehension of idiom strings (such a process would have allowed only the idiomatic interpretation to be accessed in the idiomatic context); the present work supports the view that lexical access (whether of `literal' or fixed `idiomatic' meanings) is a strictly form-driven process.

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