Metaphor and Symbol

Imposed Metaphoricity

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Imposed Metaphoricity

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We introduce a hitherto overlooked phenomenon in the cognitive and psycholinguistic study of metaphors that we termed imposed metaphoricity. We propose that a metaphorical reading can be imposed on a given expression regardless of its semantic content. We suggest that there is a class of constructions (e.g., this X is such a Y or what a Y this X is) that impose metaphorical interpretation. We present findings from three experiments and from corpus-based analyses that support our proposal. Experiments 1–2 compared interpretations of expressions that can have both a literal and a metaphorical meaning (e.g., this book is an encyclopedia) when embedded in a standard metaphorical form and in a form that imposes metaphoricity. In Experiment 3 we examine reaction time to such forms in an attempt to identify interference of form with early metaphorical processing. Two corpus-based analyses characterize the use of these two metaphorical constructions in natural language. We discuss the independence of metaphoricity from semantics, as demonstrated by forms that impose metaphorical interpretations.

FORM, SEMANTICS, AND IMPOSED METAPHORICITY

The aim of this article is to introduce the novel concept of *imposed metaphoricity*. This concept refers to a phenomenon in which metaphorical processing is imposed on a given expression regardless of its semantic content. According to the dominant view, the content of the expression is considered inseparable from its semantic status. For example, a sentence such as *This lawyer is a shark* would be interpreted as a metaphor, while a sentence such as *This fish is a shark* would be understood literally. In contrast, we propose that certain figurative forms can impose metaphorical processing on (almost) any two nouns, regardless of their semantic content.

Consider, for examples, the following sentences:

a. *This guy is a magnet.*
b. *This guy is like a magnet.*
c. *This guy is such a magnet.*
d. *He is a magnet of a guy.*

In terms of metaphorical relations, these four examples convey the same basic meaning: they all draw some sort of connection between the target (*guy*) and the source (*magnet*) of the expressions, using *magnet* to highlight the attractiveness of *this guy*. Presumably, the metaphoricity in all four

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cases derives from the same conceptual relation between the two terms, as well as from the relatively conventional metaphorical meaning of *magnet*, whereas the specific form in which this relation is conveyed does not make any substantial contribution to the construction of its meaning. As reasonable as this presumption may sound, however, we argue that these four sentences are not identical. In (a) and (b) the semantic content of the two nouns (*guy* and *magnet*) plays a crucial role in the assignment of metaphorical interpretation*,* whereas in (c) and (d) the very metaphoricity of *magnet* is guaranteed regardless of the content of either noun, and could in principle be determined on the basis of structural considerations alone.

In order to explain this argument, let us examine more carefully the following examples:

   a. *This guy is a magnet.*
   c. *This guy is such a magnet.*

Sentence (c) can be considered a minor variation on sentence (a), with the only difference being the adverbial intensifier *such*. Their meaning, therefore, might only differ in the pragmatic intensification of the metaphorical statement, similar to the difference between the two literal expressions *This guy is a tall guy* and *This guy is **such** a tall guy*. However, we argue that this marginal addition imposes a substantial constraint on the expression, in that it blocks its potential literal interpretation. Since the relation between guys and magnets can only be interpreted metaphorically, the constraint may be difficult to notice; but if we switch the topic to a term more literally related to magnets such as *a piece of metal*, the way *such* imposes metaphoricity becomes more noticeable:

   e. *This piece of metal is a magnet.*
   f. *This piece of metal is such a magnet.*

Sentence (e) evokes the obvious literal interpretation, whereas sentence (f) can only be interpreted metaphorically, even though the exact circumstances in which such statement would be uttered might seem a bit peculiar (for example, to describe a rare piece of metal displayed at a museum that attracts many visitors). The minor change in form not only intensifies the metaphorical meaning of *magnet*, but also blocks the literal reference to the concrete metallic object, forcing a metaphorical interpretation.

This example demonstrates the phenomenon of *imposed metaphoricity*, in which metaphorical processing is activated regardless of the semantic properties of the concept. In such cases the literal interpretation of the source concept is denied, even when the semantic relation between the two terms makes it more plausible, as in (f) above. Moreover, it seems that the assignment of metaphorical interpretation is imposed even when no clear metaphorical meaning can be associated with the intended source term. Consider for example the concept of *carpenter* in the sentence *This guy is such a carpenter*, which may be used to describe someone who skillfully manages to fix a kitchen chair, but could hardly refer to the actual profession. Note that this interpretation contrasts with the literal sentence *This guy is a carpenter*, which most likely evokes nothing but the profession.[1] When this type of processing is activated but no plausible

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[1]In some cases such utterances may also be used to describe the literal reference of the term, for example to point to a typical behavior (e.g., *John is driving me mad, he is constantly making arguments about everything; yes, he is such a lawyer,* assuming John is really a certified lawyer). However, even in these contexts the term still refers to a category denoting lawyer/carpenter-like properties rather than to a literal profession, i.e., the sentence is metaphorical.

metaphorical interpretation is successfully established, the utterance will be judged as meaning-less, even if there are alternative literal interpretations. Thus, it seems that almost any noun that will be placed in the source position of a sentence in the form of *this X is such a Y* will be interpreted metaphorically, regardless of the content of X and Y.

Previous studies have generally overlooked the crucial effect that this form might have on metaphor processing, most likely because they focused on the two more standard metaphorical forms, the nominal metaphor (*X is Y*) and the simile (*X is like Y*). The issue of form has been discussed mainly with regard to the more general debate over the nature of metaphorical process-ing, namely, whether it is the one of comparison or categorization. There have been suggestions that one of the two forms is more suitable for metaphorical uses than the other (Fogelin, 1988; Glucksberg & Keysar, 1990; Ortony, 1979), and thus should be easier to process metaphorically (Johnson, 1996; Miller, 1979). Other work has focused on the relation between content and form, suggesting that form-preference may be determined by certain properties related to the source and target of the utterance, making them fit better with one form or the other. In line with this tenet, authors have referred to properties such as aptness (Chiappe & Kennedy, 2001, 2003), interpretive diversity (Utsumi, 2007), type of similarity (Aisenmann, 1999) or conventionality (Bowdle & Gentner, 2005). According to Glucksberg and Haught (2006) the very form in which the utterance is embedded may itself determine the type of metaphorical processing.

Although these approaches differ in important respects, they all share the assumption that semantic and grammatical factors are independent of each other. Hence, metaphoricity is ini-tially determined by semantic properties, while the form in which the metaphor is embedded can contribute to subsequent processes of judgment or fine tuning.

The existence of form-induced metaphoricity which is blind to semantic factors may have significant bearings on theories of metaphor comprehension, as it challenges the supposedly mandatory bond between metaphoricity and semantics. The two more widely researched forms, the nominal metaphor (*X is Y*) and the simile (*X is like Y*), allow for both literal and metaphor-ical interpretations and thus content plays a crucial role in determining whether the utterance is metaphorical or literal (i.e., the semantic status of the utterance *X is a magnet* depends on the content of X). It thus seems reasonable that the process by which a certain combination of terms is interpreted as metaphorical would be considered as part and parcel of its semantic content. The existence of form-induced metaphoricity, however, suggests that there are at least two routes by which metaphorical processing can be activated: semantic (lexical, contextual) and structural (or form dependent). Hence, although the process of assigning metaphorical interpretation can be described as a manipulation on semantics, it is not necessarily derived from it, and can be triggered even in the absence of a suitable semantic content.

METAPHORICITY-INDUCING FORMS

As mentioned previously, we believe that the consensus that metaphorical processing is inher-ently semantic may result from the focus on nominal metaphors and similes. These forms are used frequently but they are not the only means by which metaphorical meanings are conveyed (see review by Goatly, 1997). We propose that the various metaphorical forms can be gener-ally divided into two qualitatively different groups, with respect to the obligatory nature of their related metaphoricity:

1. **Standard metaphorical forms**: These forms convey metaphoricity but can also be used to convey literal meanings. The two most prominent examples of this group are the nominal metaphor (*X is Y*) and the simile (*X is like Y*).
2. **Metaphoricity-inducing forms (MIF)**: These forms impose metaphorical processing on any two nouns, regardless of semantic factors such as constituent meaning or the context of the expression. This group includes various linguistic constructions that are commonly used to express intensification, such as nominal sentences with adverbial intensifiers (*this X is such a Y, this X is really Y*), appositive genitive constructions (*this is a Y of an X*), and question-like exclamations (*what a Y this X is*).

In the experiments reported below we compare processing of the same metaphorical content presented in standard metaphorical constructions and in metaphoricity inducing constructions. We focus on the Hebrew adverbial intensifier *MAMASH* (roughly translated into the English intensifier *really*, as in *This X is a real Y* or *this X really is a Y*[2]), and on the appositive genitive construction (Goatly, 1997).[3]

Earlier studies have discussed these forms in association with metaphor processing (e.g., Bolinger, 1972; Goatly, 1997; Tirrell, 1991), but their role in imposing metaphorical interpretation has been largely neglected. The appositive genitive construction (AGC) was mainly discussed with regards to its expressive function (Foolen, 2004) or the question of headedness (e.g., HaLevi, 2001; Khudyakova, 2007). In some cases discussions had no explicit reference to its metaphorical interpretation (HaLevi, 2001).

In contrast to the AGC, the adverbial intensifier construction (AIC) has been discussed in reference to its capacity to induce metaphorical interpretation. In his classic study on degree words that deals with the intensifiers *true, real, veritable,* and *regular,* Bolinger (1972) states that "the entity described by a 'true' must already belong to the category that is named and then is described as typical of its essence, while 'real' embraces metaphorical extension" (p. 134). Bolinger also describes *veritable* as limited to metaphorical interpretation, stating that "veritable X is always non-X" (p. 135). Glucksberg (1990, 2001) argued that nominal metaphors that contain the intensifier *literally* are more metaphorical than their simple nominal equivalents, but ascribed this to the general intensification of the utterance. Further attempts to explain the paradox of intensifiers whose meaning often denotes literality as markers of metaphoricity have been made before (Goatly, 1997), but their relation to the larger group of figurative forms that impose metaphorical interpretation has received no attention.

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[2]When de-grammaticalization of a given intensifier occurs, a literal interpretation may arise. For instance, in the following sentences: *We thought it was a fake encyclopedia-like diary, but it turns out this book is a real encyclopedia,* the context stresses the literal meaning of the intensifier (real vs. fake). In such cases both the intensifying and the metaphorical functions are lost. According to our terminology, these cases will no longer be defined as an example of the metaphorical form *X is a real Y*, but rather as a nominal *X is Y* form with *Y* that consists of a noun phrase (e.g., *a real encyclopedia* as equivalent to *a beautiful encyclopedia*).

[3]This construction is sometimes also called inversed syntagm (HaLevi, 2001) or expressive binomial NPs (Foolen, 2004). It is unique in its topic-vehicle inversion. For example, compare the appositive genitive *This is a giant of a scholar* with the nominal *This scholar is a giant*. Note that the inversion does not take place in the corresponding standard genitive constructions such as *This is a house of a scholar*, in which the first noun is the head of the construction. The latter construction can also be used to convey a metaphorical meaning (e.g., *A heart of stone*) but is not included in the group of metaphoricity-inducing forms.

EXPERIMENTAL DESIGN

In the following studies we used several methods to demonstrate the existence of the phenomenon at hand. We first tested the impact of form on interpretation, by having participants choose between given contexts (Experiment 1) as well as by asking them to paraphrase utterances (Experiment 2). In Experiment 3 we measured reaction time to identify online evidence of processing, thus ruling out the possibility that the final interpretation masks important processing stages. In the first two experiments we used conventional source terms (e.g., *encyclopedia, gold*), whereas in Experiment 3 we also included anomalous source terms (e.g., *toothbrush, carburetor*). In addition, a corpus-based study was conducted to investigate whether the effect of form is manifested in natural language as well.

The Effect of Figurative Form on Utterance Final Interpretation

The first two experiments were designed to verify our basic argument according to which metaphorical processing can be activated independently of semantics, and specifically, that form-induced metaphoricity can overcome semantically based considerations. To test this hypothesis we used a special kind of metaphorically ambiguous sentences that can be interpreted both literally and metaphorically. Our experimental stimuli included sentences such as *This book is an encyclopedia*, which can either refer to a literal encyclopedia (e.g., Encyclopedia Britannica), or imply that the book contains a valuable and detailed source of information. We hypothesize that metaphoricity-inducing forms block the potential literal meanings of the source term, thus leading to the exclusive assignment of metaphorical interpretation to the entire utterance.

To test this hypothesis we compared the number of literal and metaphorical interpretations generated for the standard nominal metaphor form and for metaphoricity inducing forms. We predicted that the former would lead to no clear preference toward metaphorical interpretations, whereas the latter would lead almost exclusively to metaphorical interpretations.

Experiment 1: Context Preference

Method.

Participants.   Twenty-two native speakers of Hebrew (15 women, 7 men) with a mean age of 34 ($SD = 14$), participated in this experiment, 14 of them were students in Lewinsky College of Education in Tel Aviv and the others had academic degrees in various fields. All participants were volunteers.

Stimuli.   We constructed 15 metaphorically ambiguous Hebrew utterances by pairing highly conventional metaphorical source terms with concepts denoting the literal categories that they belong to. The conventionality of the source terms was determined by the two authors and three other native speakers who did not take part in the experiment; only items that were rated as highly conventional by all judges were included in the list. For example, the highly conventional source terms *encyclopedia* or *gold* were paired with the concepts *book* and *stuff,* respectively. This pairing resulted in the following nominal sentences: *This book is an encyclopedia* and *This stuff is*

gold.[4] Two MIF versions were created for each source term: an adverbial intensifier construction (e.g., *this book is a real encyclopedia*) and an appositive genitive construction (e.g., *this is an encyclopedia of a book*).

In addition, we constructed two paragraphs that placed the items either in a metaphorical or in a literal context, as in the following example:

This book is an encyclopedia

Literal Context: *No, this book you see on the shelf is not a novel; I took it from the university yesterday in order to complete my paper. **This book is an encyclopedia**.*

Metaphorical Context: *I enjoy reading this new novel very much; it's such a useful source of information. **This book is an encyclopedia**.*

This stuff is gold

Literal Context: *There is a problem, the customer specifically asked for a silver bracelet, but **this stuff is gold**.*

Metaphorical Context: *My sister brought me a new fabulous stain remover, **this stuff is gold**.*

In principle, the literal and metaphorical interpretations do not necessarily exclude one another. For example, a literal encyclopedia can also be an exceptional source of information, and be figuratively described as such. Thus, we attempted to distinguish between the two interpretations through contexts. Note for example that while the literal connotation of *gold* in the above example is negative, the metaphorical one is positive. The order of the two contexts was determined randomly to prevent strategic assignment of metaphoricity by order of contexts. Three lists of stimuli were constructed, each containing one third of the 15 items in nominal metaphor forms, one third in an adverbial intensifier construction, and one third in an appositive genitive construction.

Procedure.   Participants were asked to first read the target sentence, and then to decide which of the two following paragraphs was more compatible with it. No further explanations were provided.

Results and discussion.   Figure 1 presents the selection of literal and metaphorical contexts. As predicted, participants selected a greater proportion of literal contexts for nominal metaphor forms (47%) than they did for MIF utterances (21% for adverbial intensifying constructions and 8% for appositive genitive constructions). A Mann-Whitney analysis showed that the difference was significant for both participants, $U(42) = 29$, $Z = -5.234$, $p < 0.001$, and items, $U(28) = 21$, $Z = -3.964$, $p < 0.001$. These results support our proposal that the very use of certain figurative forms induces metaphorical processing, or blocks the literal interpretation of the intended source term. The relatively high proportion of literal contexts for the adverbial intensifier construction can be ascribed to sporadic de-grammaticalization of the intensifier (see footnote 2). There was one item in particular *(This fabric is a real silk,* metaphorically *pleasant to touch)* that led all participants to select a context that did not fit our predictions (i.e., preferring the literal interpretation in the adverbial intensifier construction).

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[4]The Hebrew word for this example was חומר, meaning *stuff* or *material*.
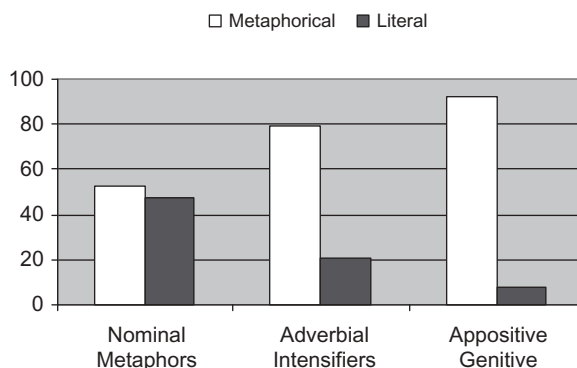
FIGURE 1 Proportions (%) of literal and metaphorical interpretations (choice between given contexts).

Experiment 2: Free Paraphrasing

The results of Experiment 1 fit nicely with our assumption that metaphoricity can be imposed on an utterance regardless of its content. However, this assumption implies that the choice of a literal or metaphorical context indicates participants' original interpretation. Though the method used in Experiment 1 is rather common (e.g., Giora, Fein, Metuki, & Stern, 2010; Glucksberg & Haught, 2006), it is still possible that the very existence of given contexts may somehow bias participants to prefer one interpretation over the other. In other words, it is possible that the task merely demonstrates a *match* between form and content, but fails to demonstrate the active *shaping* of content by form. In Experiment 2 we thus used a free paraphrasing task to examine this stronger possibility.

Method.
Participants.   Thirty native speakers of Hebrew, with a mean age of 29 (*SD* = 3.8) took part in this experiment. Most participants were undergraduates at Tel Aviv University and all were volunteers.

Stimuli.   Ten target items were used, along with eight fillers. Target items were taken from the stimuli of Experiment 1 and fillers contained only literal sentences, whose form was similar to the metaphorical forms (e.g., *This guy is a doctor, This cat is real pretty,* and *This is a wheel of a motorbike*). The literal fillers were used to block any metaphorical bias. In addition, two literal items were used for practice (*This cake is tasty* and *This table is old*). The stimuli were divided into three lists, identical in every respect except for the form of the target items. One list contained only nominal metaphors, another list contained only adverbial intensifying constructions, and the third list contained only appositive genitive constructions. No given contexts were added.

Procedure.   Participants were asked to provide a short description of a situation in which each utterance could be used. No further instructions were given.

Results and discussion.
The contexts generated by the participants were analyzed and classified as either literal or metaphorical by three judges (the two authors and another native
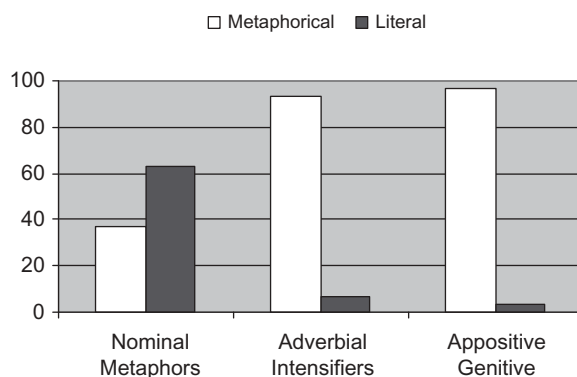
FIGURE 2 Proportions (%) of literal and metaphorical interpretations
(free paraphrase).

speaker). Results of this analysis are presented in Figure 2. Only 5 cases (1.7%) were ambiguous
(referring to both literal and metaphorical interpretations), and these cases were classified as
metaphorical. In addition, three participants explained some AGC items without explicit reference
to the interpretation that derive from this form, with their descriptions reflecting grammatical
mistakes of young children or non-fluent speakers. There were only six such cases and they were
excluded from the analysis. One participant failed to provide interpretation for almost all AGC
items (explaining that he did not understand the meaning of the phrases), and was excluded from
the analysis as well. We believe that these cases suggest that the AGC is not commonly used in
Modern Hebrew (see also corpus study below).

Most nominal metaphors were given literal interpretations (63%). In contrast, almost all MIFs
were classified as metaphorical, with fewer than 5% of interpretations being literal. Metaphorical
interpretations accounted for 93% of interpretations of the adverbial intensifier construction and
97% of interpretations of the AGC. A Mann-Whitney analysis showed that the difference between
nominal metaphorical forms and MIFs was significant for both participants, $U(28) = 1$, $Z =
-4.611$, $p < 0.001$, and items, $U(18) = 4$, $Z = -3.517$, $p < 0.001$.

The results of experiment 2 support the results of Experiment 1, suggesting that the con-
texts that we provided in Experiment 1 might have limited the actual difference between the two
form types. The fact that participants preferred a metaphorical interpretation for MIF items is
especially impressive considering that there were no potentially biasing examples of metaphors
in either fillers or practice items. A qualitative analysis of the five cases in which MIF items
were interpreted literally indicates that in three of them de-grammaticalization of the intensifier
took place (see footnote 2), that is, the adverbial intensifier "real" was understood literally as an
indicator of authenticity.

The results of these two experiments demonstrate that the form not only matches one semantic
content better, but that it also shapes the nature of that content. The clear-cut preference toward
metaphoricity despite a literal bias in the second experiment provides evidence that metaphorical
processing is imposed rather than just encouraged by form. In this regard, MIF is different from
other possible markers of metaphoricity.

Experiment 3: Interference of Form in Early Stages of Processing

If form can activate metaphorical processing regardless of content, as we argue here, then it may affect not only the final stages of interpretation but also the early stages of processing. Early interference may push the listener toward metaphorical understanding of a given expression even when no such suitable meaning can eventually be found. Evidence for the existence of such early processing would strengthen our argument.

To investigate early processing we measured reaction times in a judgment task. Participants were presented with anomalous and metaphorical expressions embedded in standard metaphorical forms and in MIFs, and were asked to judge whether each utterance was meaningful. We suggest that such a paradigm can expose the effect of form on early stages of processing, even when no similar effect is noticeable at the level of final interpretation.

In standard metaphorical forms (e.g., *This teacher is an encyclopedia, This kid is a carburetor*), judgment of meaningfulness is based on semantic evaluation of content, and depends on whether a suitable metaphorical relation can be established between the two nouns. In MIFs, on the other hand, both content and form affect the decision. Anomalous MIFs (e.g., *This kid is such a carburetor*) lead to a conflict because in terms of content the sentence is meaningless but the form imposes a search for metaphorical meaning, and hence calls for a decision that the utterance may be meaningful. Content may bias the final decision so that the expression will most likely be rejected as meaningless on semantic grounds, but the conflict will lead to longer reaction times relative to the standard form. No such conflict characterizes metaphorical MIF (i.e., *This teacher is such an encyclopedia*), in which both content and form converge on the same decision (judging that the expression is metaphorical, and hence meaningful).

We thus predict different reaction times for judgment of meaningfulness on conventional and anomalous MIFs, but not on conventional and anomalous items embedded in standard metaphorical form. Due to the simplicity of the task, we expect most trials to end with "correct" answers (i.e., saying that metaphorical items are meaningful and anomalous items are meaningless). We thus expect to record the effect of form in reaction time data but not in accuracy data.

Method.

Participants.   Twenty-two native speakers of Hebrew (11 women, 11 men), with a mean age of 31 ($SD = 10$) took part in this experiment, all were either students or having an academic degree, and all were volunteers.

Stimuli.   A set of 24 conventional metaphorical item pairs (e.g., *teacher-encyclopedia*) and 24 anomalous item pairs (e.g., *kid-carburetor*) was produced by expanding the list of source terms that were used in Experiments 1 and 2. These source terms were then matched with an appropriate topic to create a conventional pair or with an inappropriate topic to create an anomalous pair. Three independent judges rated stimuli for meaningfulness and metaphoricity. Each item pair was embedded in both the standard nominal form (e.g., *This teacher is an encyclopedia; This kid is a carburetor*), and the adverbial intensifier construction (e.g., *This teacher is such an encyclopedia; This kid is such a carburetor*).

Pilot studies showed that responses to the appositive genitive construction are longer than are responses to length-matched constructions, probably because it is not very frequent in the language. For this reason we did not select the AGC as a target in the current experiment. However, AGC versions of each item were created to serve as fillers.

Procedure.   Conventional and anomalous target stimuli were divided into three lists and equated for length (mean number of letters for conventional pairs: 10.4; mean number of letters for anomalous pairs: 11.5). Each list was embedded in a different form, so that every participant saw an equal number of the six possible combinations of content and form (conventional and anomalous nominal metaphors, conventional and anomalous adverbial intensifier construction, as well as conventional and anomalous AGC that were used as fillers). Each item pair was presented only once in each list.

The items were presented on a 10.1-inch computer screen, each item at a time (in random order). Participants were asked to determine whether the sentence that they read was meaningful by pressing one of two keys (right shift for YES, left shift for NO). They were instructed to make their decision as fast as possible. Each item remained on the screen until some choice was made, and was then replaced by the next item. The task began with eight practice trials.

Results and discussion.   Participants made 19.3% errors on average on conventional items and 3.5% on anomalous items. Reaction times of erroneous responses were excluded from analysis. Figure 3 presents reaction times by type of stimuli.[5]

A repeated-measures analysis of variance (ANOVA) revealed a main effect of content, $F(1) = 11.297$, $p = 0.03$, so that processing of conventional items ($M = 1543$, $SD = 434$) was faster than processing of anomalous items ($M = 1786$, $SD = 534$). In addition, there was a main effect of form, $F(1) = 5.585$, $p = 0.028$, so that processing of standard metaphorical forms ($M = 1585$, $SD = 481$) was faster than processing of MIF ($M = 1744$, $SD = 509$). As predicted, a significant interaction between content and form was also found, $F(1,21) = 4.68$, $p = 0.042$,

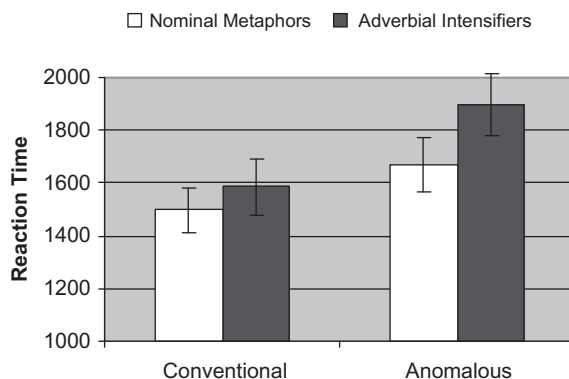FIGURE 3   Reaction times (in ms) for adverbial intensifying constructions and nominal metaphors by item type.

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[5]The relatively higher rate of "false-negative" errors probably derives from the nature of the task, which seems to encourage the dismissal of sentences as meaningless due to the short time of response and the large amount of meaningless sentences that comprised the stimuli set. In fact, our result replicate almost the exact same error rates that were found in a previous study (Shibata et al., 2012) that also used online meaningfulness judgments of metaphorical and anomalous sentences embedded in different forms. In that study, participants made 20.2% errors on average on metaphorical items and 2.7% on anomalous items embedded in nominal form, a pattern of results that is very similar to our study (simile form, both metaphorical and anomalous, yielded a relatively law error rate).

so that form had no effect on processing of conventional items, $t(21) = -1.373$, $p = 0.184$, but it affected performance on anomalous items, $t(21) = -2.743$, $p = 0.012$. In other words, processing of anomalous MIFs was slower ($M = 1900$, $SD = 118$) than processing of anomalous items embedded in standard form ($M = 1671$, $SD = 107$), but no such difference was found for conventional items, with reaction time on standard forms ($M = 1498$, $SD = 83$) resembling reaction time on MIFs ($M = 1587$, $SD = 102$). These findings suggest that form interferes only when rejecting allegedly meaningless items.

The conflict between the form of the utterance and its content supports our hypothesis regarding the existence of two routes to metaphoricity, a semantic and a structural one. In general, the results of Experiment 3 suggest that form can generate metaphorical processing independently of, and even in contrast to, the utterance's final interpretation, and thus that "metaphorical processing" can be triggered even if no "metaphorical content" or "metaphorical interpretation" are available. These findings strongly support our description of metaphorical processing as a semantically independent process.

CORPUS-BASED ANALYSES

If MIFs enforce a certain interpretation, we would expect to find evidence for this constraint in natural language as well. In order to test this prediction, we used Google's search engine to compare the first occurrences of 36 potential source terms, 16 conventional metaphorical (e.g., *bulldozer, gold*) and 20 anomalous ones (e.g., *radiator, carp fish*), when embedded in both standard (nominal metaphors and similes) and metaphoricity inducing forms (the adverbial intensifier construction and the appositive genitive construction). For each potential source term, the search was conducted with no specification of topic (e.g., *is a bulldozer, is like a bulldozer, is a real bulldozer, a bulldozer of a*) in order not to bias the results toward metaphorical or literal interpretations. We expected to find both literal and metaphorical uses of the same concepts in standard metaphorical forms (e.g., *This heavy truck is a bulldozer, My mom is a bulldozer*). In contrast, we expected to find nearly no literal uses of the concepts at stake when embedded in a MIF. The search was limited to the first 30 results for nominal metaphors, similes, and adverbial intensifier constructions, and for the first 300 results for appositive genitives, due to the infrequency of this construction in Hebrew language and its similarity to standard genitive constructions.[6]

Results

Conventional Source Terms

After omitting repetitions and regular genitive constructions, 1424 relevant results were identified for analysis. Figure 4 presents the average proportions of literal and metaphorical uses of each form.

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[6]We excluded results that reflected standard (and not appositive) genitive construction, such as *a bulldozer of a construction site*.
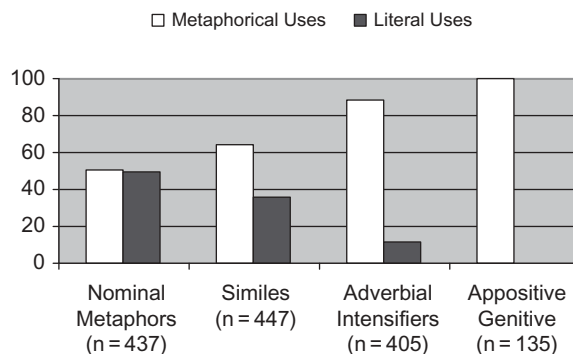
□ Metaphorical Uses   ■ Literal Uses

FIGURE 4   Proportions (%) of literal and metaphorical interpretations in natural language corpus (conventional source terms).

There were similar numbers of literal (49%) and metaphorical (51%) nominal metaphor forms. Slightly fewer similes were literal (36%) than metaphorical (64%). A clearer preference toward metaphoricity was demonstrated for MIFs. Only 12% of the adverbial intensifier constructions had a literal meaning, and none of the appositive genitive constructions were literal. Fisher's exact test was used for each item separately to compare the proportion of literal and metaphorical interpretations between the two types of forms, yielding highly significant results (see Table 1). All cases but one remained significant after Bonferroni correction.

Anomalous Source Terms

Only 184 occurrences of adverbial intensifier constructions were found when anomalous source terms were used (approximately one third of the number of the equivalent standard forms) and no examples of appositive genitive constructions were found. These results are not surprising, since MIF should be limited to convey metaphorical meanings alone, and the items were originally selected because they lacked such meanings. After omitting identical results, 1165 relevant results were analyzed. Six items yielded fewer than five search results when embedded in MIF and were thus excluded from the analysis. Figure 5 presents the average proportions of literal and metaphorical uses of each form.

The average number of metaphorical interpretations was 5.78 hits per 30 results. Of the nominal metaphor forms 11% were metaphorical and of the similes 33% were metaphorical. As predicted, the majority of MIFs were metaphorical (79%). Fisher's exact test was used for each item separately, comparing the proportion of literal and metaphorical interpretations between the two types of forms. The analysis demonstrated significant differences in all but three cases (see Table 2). After Bonferroni correction two comparisons were no longer significant.

The findings of both studies suggest that the use of MIF in natural language is highly constrained, and is restricted almost exclusively to metaphorical contexts. Also, the relatively high rate of metaphorical uses of anomalous source terms when embedded in MIF suggests that these constructions may assist in the creation of novel metaphors in natural language.

TABLE 1
Distribution of Literal and Metaphorical Uses in Natural Language Corpus (Conventional Source Terms) and Results of Fisher's Exact Test

| Source Term | Standard Form (Simile and Nominal Metaphors) | | MIF (AGC and AIC) | | p Value |
	Metaphorical	Literal	Metaphorical	Literal	
worm	15	41	22	7	p < .001
dinosaur	16	57	26	2	p < .001
jungle	41	55	23	6	p < .005
bulldozer	45	50	31	0	p < .001
witch	29	58	24	3	p < .001
snake	24	50	13	8	p < .05
tractor	31	58	22	3	p < .001
zoo	36	78	28	3	p < .001
encyclopedia	7	58	25	5	p < .001
pig	34	48	19	1	p < .001
gold	18	48	42	2	p < .001
magician	29	48	16	3	p < .001
rag	46	72	56	2	p < .001
candy	38	51	55	1	p < .001
diamond	43	53	47	0	p < .001
pearl	35	44	45	0	p < .001
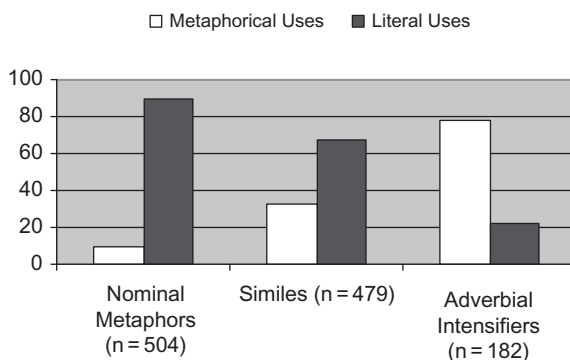
FIGURE 5 Proportions (%) of literal and metaphorical interpretations in natural language corpus (anomalous source terms)

GENERAL DISCUSSION

The goal of the present article was to provide empirical evidence for the phenomenon of imposed metaphoricity. We proposed that a metaphorical mode of interpretation could be imposed on a given expression regardless of its semantic content. Our findings suggest that the processing of content is highly dependent on the figurative form in which this content is embedded.

TABLE 2
Distribution of Literal and Metaphorical Uses in Natural Language Corpus (Anomalous Source Terms) and
Results of Fisher's Exact Test

Source Term	Standard Form (Simile and Nominal Metaphors)		MIF (AGC and AIC)		p Value
	Metaphorical	Literal	Metaphorical	Literal	
kettle	10	73	6	11	$p < .001$
stool	5	51	2	6	$p < .2$
radiator	3	84	2	3	$p < .05$
watermelon	6	36	19	4	$p < .005$
banana	12	25	7	6	$p < .19$
carp fish	16	37	8	2	$p < .005$
iguana	12	27	7	2	$p < .05$
gramophone	13	41	5	5	$p < .12$
coca cola	6	45	10	0	$p < .001$
shakshuka (popular dish)	10	43	19	2	$p < .001$
lawn mower	11	26	8	0	$p < .001$
earless seal	12	23	16	2	$p < .001$
dishwasher	2	44	5	0	$p < .001$
drill (tool)	20	59	9	3	$p < .005$

In Experiments 1 and 2 we found that standard metaphorical forms yield an equal number of literal and metaphorical interpretations, whereas MIFs yield nearly 100% metaphorical interpretations. This pattern of results was observed both when participants were asked to select meanings on the basis of two alternative contexts (Experiment 1) and when they were asked to paraphrase expressions with no relevant context (Experiment 2). Experiment 3 documented reaction time differences between standard forms and MIFs. Our results suggest that metaphorical processing can be triggered even when a metaphorical meaning cannot be successfully established. Taken together, the findings from all three experiments indicate that the process by which a metaphorical interpretation is generated is independent of a given content. This conclusion was further supported by a corpus-based study that identified usage in natural language. As predicted, concepts embedded in MIF were more commonly used metaphorically than concepts embedded in standard metaphorical forms. These findings seem to challenge the argument that metaphorical meaning is inseparable from the process by which it is generated, and thus call for a revised, semantically independent definition of that process. In the following sections we discuss some related phenomena that may help in this re-definition of metaphoricity.

Metaphoricity, Salience, and Categorization

Giora et al. (2013; see also Giora et al., 2010) have recently suggested that some forms of negation may encourage nonliteral interpretation of the concept they negate. For example, the negative expression *you are not my boss* is more likely to have a metaphorical interpretation than its affirmative version *you are my boss*. Giora et al. termed this phenomenon default nonliteral

interpretation. Although some aspects of this phenomenon resemble the one that we discuss in the current article, there are several important differences, among them the obligatory nature of MIF and its independence on content.[7]

The most important difference between MIF and negation-related metaphoricity, however, lies in the role of salience. According to Giora et al. (2010, 2013), negation functions as a low-salience marker that highlights some low-salience nonliteral features of the concept that it negates, such as the literal meaning of *boss* in the above example. According to that view, negation-derived metaphoricity relies on salience inversion rather than on metaphoricity-inducing *per se*: the same effect should apply to concepts with low-salience literal meanings as well, which would turn literal when negated in Giora et al.'s model. Consider, for example, the rather salient metaphorical meaning of the utterance *This vacation is a dream.* In line with the hypothesis of negation as a low-salience marker, the negative version of this utterance *This vacation is not a dream* will lead to a literal interpretation. In contrast, adding *such* to the utterance (e.g. *This vacation is such a dream*), has no similar effect, as both versions remain metaphorical. In other words, while the impact of negation seems to work in both directions, from literal to metaphorical and from metaphorical to literal, the process activated by MIF is unidirectional, going only from literal (or metaphorical) to metaphorical, but not the other way around.

Hence, our findings suggest that beside the salient/non-salient distinction, which has been identified as the basis of many figuratively related phenomena (Giora, 1999, 2004, 2008), there may also be a cognitive reality to the distinction between literality and metaphoricity, or, to be more precise, that metaphorical processing might be the manifestation of another, autonomous, linguistic mechanism.

One such mechanism which may underlie MIF is the process of abstraction that is hypothesized by latest versions of categorization models of metaphor (Glucksberg and Haught, 2006; Haught, 2013). According to this "categorization" view, while being used in a literal sentence or a simple comparison, a term such as *shark* refers to the actual marine creature with fins and sharp teeth. However, when placed in the source position of a nominal metaphor, as in *My lawyer is a shark*, the term refers to the ad-hoc abstract category that is exemplified by the literal shark, for example, "vicious and predatory entities." Note, that this model still assumes metaphorical content as a prerequisite for any metaphorical processing (if *my lawyer* in the above examples is replaced by *my fish*, all metaphorical interpretations will be ruled out) and was intended, originally, to describe the effect of nominal metaphors only. However, we propose that the mechanism that this model assumes, namely, the transformation of the source concept into a category through the abstraction of its concrete features, may be generalized to apply to the effect of MIFs as well: this process renders a certain concept metaphorical, and can be triggered by extra-semantic factors, such as the use of certain metaphorical forms; and it may be applied to non-conventional

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[7]According to Giora et al. (2010), negative and affirmative utterances yielded 68% and 43% metaphorical interpretations, respectively. In contrast, in our experiment the same items that led to approximately 50% metaphorical interpretations when embedded in standard metaphorical form yielded more than 90% metaphorical interpretation when embedded in MIF. As for content selectivity, Giora et al. (2013) speculate that there are some properties of the negated concepts that might affect their submissiveness to the metaphorical function of negation, such as the level of abstraction. For instance, *This is not a bus* may be interpreted metaphorically, whereas *This is not a local bus* would probably not be interpreted as such, due to the specificity of the negated concept. This factor plays no role in the case of imposed metaphoricity, so that both *This is such a bus* and *This is such a local bus* are equally metaphorical (though not necessarily with the same metaphorical meaning).

source terms as well (e.g., *carpenter*). If this is indeed the case, then another way to describe the phenomenon of imposed metaphoricity would be to assume *forced categorization* or *forced abstraction* of the source concept.

Metaphoricity and Intensification

As far as we know, our proposal to look at such presumably unrelated forms as the adverbial intensifier construction or the question-like exclamation together under the MIF title is quite unique. Apart from their metaphorical function, MIFs may also share a pragmatic function of expressing evaluation of a given topic (cf. Foolen, 2012). Consider, for example, the difference between the relatively unmarked nominal sentence *He is a tall guy* and its MIF counterparts *He is such a tall guy* or *What a tall guy he is.* The adverbial intensifier or the question-like exclamation do not induce metaphoricity in these cases, and instead they enhance the literal meaning of the sentence, stressing the *tallness* of *this guy*. These examples suggest that MIFs have different outcomes if they apply to nouns and to adjectives, or to gradable and non-gradable concepts. When applied to most nouns, the result is metaphorical, whereas when applied to adjectives (*tall* in the above examples) or to evaluative nouns (i.e., *idiot, genius*) the result is of literal expressive intensification. We believe that this dual function may be the key to understanding the phenomenon described in this article, and more generally, the key to understanding the relation between metaphoricity and expressivity. Both phenomena may be manifestations of the same process, which can generally be described as the mechanism by which a relevant feature of a concept is being enhanced.

This description fits well with the common view of metaphorical processing as the enhancement of one feature of the source term over other features (e.g., Gernsbacher, Keysar, Robertson, & Werner, 2001; Rubio, 2007), and can also explain the process of categorization by abstraction suggested by Glucksberg and Haught (2006). If we assume that MIFs activate a feature enhancement mechanism, then their dual function reflects an attempt to adapt the relatively simple process of expressive intensification to concepts that are less apt for such intensification.

When a MIF is applied to a simple gradable concept, the feature most relevant to this concept is enhanced. In the case of *tall,* for example, *height* is enhanced. However, while most adjectives or evaluative nouns (e.g., *tall, big,* or *idiot*) display an obvious gradable feature, most nouns do not seem to do so. It is unclear how something can be *more of a chair* or *more of a magnet* (but see Sassoon, 2011). We suggest that intensification of non-gradable concepts enhances a certain feature of a concept over others. For instance, when *such* intensifies *magnet,* it enhances the fact that *magnets* attract other materials and suppresses less relevant features, such as its metallic qualities. In other word, the attempt to intensify a concept that cannot be commonly intensified may turn the concept into a metaphor.

This enhancement of one feature of a given concept over other features leads both to an expressive function and to a metaphoricity inducing function. Thus, other than accounting for the underlying mechanism by which MIFs work, our hypothesis may also shed light on the well established linkage between the uses of expressive or emotive language and figurative language (Crawford, 2009; Foolen, 2012; Ortony & Fainsilber, 1989). Other views may explain this linkage in terms of contextual similarity between these two usages, stressing the tendency to search

for stronger language when being emotionally involved, and the use of metaphorical language as a result (for discussion see Foolen, 2012). We argue that the two phenomena may actually stem from the same basic process.

In sum, this research is innovative in that it demonstrates that metaphorical processing can be activated regardless of semantic factors, that form can determine final interpretations, and that activation of metaphorical processing can occur even without a final metaphorical interpretation. These findings may bear significant implications for theories of metaphor comprehension, calling for a new understanding of the general linguistic mechanisms that underlie the assignment of metaphorical interpretation.

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