Negation as a metaphor-inducing operator
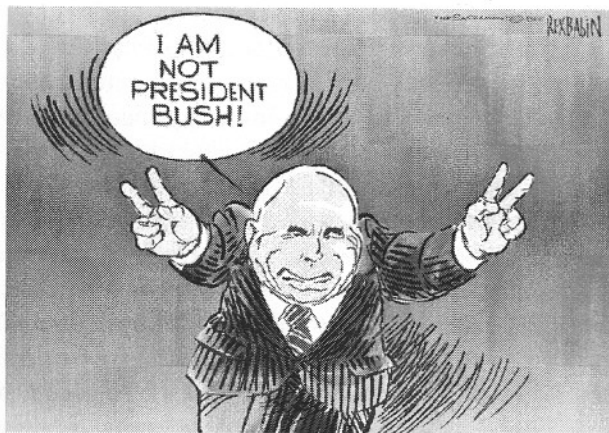
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This paper is dedicated to the White Rose resistance whose motto was: *We will not be silent. We are your bad conscience. The White Rose will not leave you in peace![1]*

1. Introduction: Processing Negation

Consider the following cartoon (Babin 2008):

(1)

How do we go about processing it? How do we make sense of it? Suppose we start by trying to make sense of the negative statement which cites McCain's in the third presidential debate (York 2008): *I am not President Bush*. Taken at face value, this statement is literally true but redundant. Even replacing the negated concept – *Bush* – with an available alternative – *McCain* – is literally true but similarly uninformative. This, then, is most probably not the way we represent the statement. Suppose then that we attempt an alternative nonliteral interpretation such as 'I am not like/similar

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to President Bush'; 'Do not compare me to President Bush'. What processes do these more informative interpretations involve? By rejecting a similarity to Bush, McCain allows an instant activation of an affirmative metaphoric comparison "I am Bush", which highlights the affinities he intends to deny. *I am not President Bush* is thus represented as "I am President Bush" (alongside its rejection), as has also been ironically interpreted by one of the postings on YouTube which records Bush and McCain's closeness and similarity[2] (On negative comparisons as comparisons see Giora, Zimmerman and Fein 2008).

Moreover, taken as a whole, the cartoon invokes yet another comparison, which also results in an ironic reading of the statement. By giving the image of McCain a Nixonian hunch and the double-V sign Nixon was famous for, the cartoonist invites comprehenders to access Nixon's infamous *I am not a crook* (Kilpatrick 1973), which was also subjected to the same interpretation processes as McCain's statement: It evoked a public perception of Nixon as a crook, in spite of the use of negation (and despite the availability of an alternative opposite such as "honest").[3]

These (possible) interpretation processes must rely heavily on the accessibility of information within the scope of negation. They could not have emerged had negated information been either initially inaccessible or initially accessible but rendered inaccessible later on due to suppression processes assumed obligatory following negation (MacDonald and Just 1989). Can studies into the online processes involved in interpreting negated concepts and utterances shed light on the interpretive insights exemplified above? Will negation allow comprehenders access to what is within the scope of negation, as might be deduced from the example above, or will that concept be blocked, either initially or later on, given the negative operator?

Recent findings in psycholinguistics show that, across the board, when negated and nonnegated concepts (*rocket* in *The train to Boston was/was* ***not a rocket***; *open* in *The door is/is* ***not open***) are encountered, they are accessed immediately, regardless of whether they are negated or not.

Initially, then, processing negated and nonnegated concepts follow similar processing routes and exhibit no asymmetry: Both make available the affirmative (salient[4]) meaning of the concept, although in the negative condition this meaning is contextually incompatible (Ferguson and Sanford 2008; Ferguson, Sanford and Leuthold, 2008; Fischler, Bloom, Childers, Roucos and Perry 1983; Giora, Balaban, Fein and Alkabets 2005; Hasson and Glucksberg 2006; Kaup, Lüdtke and Zwaan 2006; MacDonald and Just 1989; for a review, see Giora 2006).

Will that meaning resist negation effects even when extra processing time is allowed? Theoretically, later processes might be susceptible to a number of effects following negation: they might result in reducing the accessibility of the negated concept, either fully or partially, or keep it intact. Whereas the various theories in psycholinguistics converge on the initial access phase, they tend to disagree on the effects of negation occurring at the later processing stages.

The prevailing assumption in psycholinguistics is that, once enough processing time is allowed, negation affects suppression of negated concepts unconditionally so that they are (i) discarded from the mental representation altogether and (ii) replaced by an available opposite (The suppression hypothesis). Findings indeed show that when presented in isolation, negated concepts are eliminated from the mental representation about 500–1000 msec following their offset, at which stage, initial levels of activation are reduced to base line levels (Hasson and Glucksberg 2006; Kaup, Lüdtke and Zwaan 2006; MacDonald and Just 1989). Findings also show that when sufficient processing time (1500 msec) is allowed, negated concepts are often replaced by an alternative opposite (Kaup, Lüdtke and Zwaan 2006), should this be available (Mayo, Schul and Burnstein 2004, but see Prado and Noveck 2006). Thus, while 750 msec following its offset *open* in *not open* lost initial levels of activations, another 750 msec later, it was replaced by an opposite – "closed" (Kaup et al. 2006). Similarly, between 150–500 msec following their offset, negated and nonnegated concepts (*not a rocket/a rocket*) were both represented as "fast". However, 1000 msec following their offset, their initial levels of activations were preserved only following affirmative contexts (*The train to Boston was a rocket*), in which this meaning was contextually compatible.

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3   "Note that the cartoon as displayed on that site is in fact "animated", and the Nixonian double-V salute pops up only after McCain denies he's Bush, as if it's the inevitable subtext.   What it especially reminds me of is the Dr. Strangelove character (the ex-Nazi rocket-scientist-cum-mad-bomber working for the U. S. nuclear program) in the eponymous film whose right hand, as if it had a will of its own, would suddenly extend into the Heil Hitler salute" (Laurence R. Horn, email communication, 20.11.08).

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4   A meaning is *salient* if it is coded and foremost on our mind due to factors such as experiential familiarity, frequency, conventionality, prototypicality etc. (see Giora 1997, 2003).

Outside a specific context, then, negated concepts are eventually suppressed. Indeed, it has been widely acknowledged that negation (mainly 'No' and 'Not') reduces the accessibility of the affirmative meaning of the concept within its scope so that it can deny, reject, convey disagreement, or correct this information by activating an alternative replacement (for reviews, see Ferguson, Sanford and Leuthold 2008, Giora 2006, Horn 2001, Israel 2004, Jespersen 1924, Pearce and Rautenberg 1987 inter alia).

An alternative view to the suppression hypothesis – the SUPPRESSION/ RETENTION HYPOTHESIS – has been proposed by Giora and colleagues, which argues that suppression following negation is not obligatory but sensitive to discourse goals and requirements. Information will be disposed of if it is deemed unnecessary or obstructing, regardless of negation. (On suppression following affirmative concepts and on suppression as a context driven mechanism, see Gernsbacher 1990). In this respect, negation is not different from affirmation – both might lead to suppression or retention of concepts depending on specific contextual information and speaker's intent (Giora 2006).

According to Giora and colleagues (Giora 2006; Giora, Fein et al. 2007), then, both negated and nonnegated concepts can either maintain their initial levels of activation or allow their gradual reduction up to base line levels and below, depending on discoursal factors (the SUPPRESSION/RETENTION HYPOTHESIS, Giora 2003). Contra the received view, then, in this respect, negation and affirmation are not different; they do not exhibit asymmetric effects even when later processes are concerned (Giora 2006, 2007; Giora, Balaban et al. 2005; Giora, Fein et al. 2005).

Indeed more recent studies have shown that when negated concepts are not presented in isolation but instead are embedded in a supportive context, they need not be suppressed and replaced by an alternative. Instead they can be retained if deemed useful for the unfolding context. Thus, when negated concepts (*The train to Boston was **not a rocket***) were furnished with a relevant late context discussing the same discourse topic (*The trip to the city was fast, though*), their so-called contextually inappropriate interpretation (*fast*) was not discarded from the mental representation but instead remained accessible at least as long as 1000 msec following their offset. In contrast, when followed by an irrelevant context, these interpretations were dampened. Similarly, when embedded in a supportive prior context (*millionaires* in *I live in the neighborhood of **millionaires** who like only their own kind. Nonetheless on Saturday night, I also invited to the party at my place a woman who is not **wealthy***) negated concepts (*wealthy*) preserved their accessibility as long as 750 msec following their offset (Giora, Fein, Aschkenazi and Alkabets-Zlozover 2007).

It is precisely this persisting accessibility of negated information that allows negation to affect its representation in various ways. For instance, negated concepts have been shown to induce mitigation of their interpretations so that "not pretty", for instance, was represented as "less than pretty" rather than as "ugly" (Giora, Balaban et al. 2005; Horn 1989, 2001; Jespersen 1917, 1924; Paradis and Willners 2006). In addition, compared to affirmative modifiers *(almost)* negation is a rather strong mitigator, representing a weaker or more hedged version of the affirmative (Giora, Balaban et al. 2005). Negated concepts have also been shown to be represented as a mitigated version of their alternative opposites, so that "not pretty" was represented as a hedged version of "ugly" (Fraenkel and Schul 2008). However, when negating an end of the scale member of the set ("not very pretty"), mitigation via negation invited an ironic interpretation even outside a specific context (Giora, Fein, Ganzi, Alkeslassy Levi and Sabah 2005; Horn 2001: Chapter 5).

Along the same lines, it is this accessibility of negated information that allows negative comparisons to come across as comparisons, maintaining the prototypical features of the source domains (*Hitler* in *Bush isn't Hitler*) as shown by both lab results and natural data (Giora 2007; Giora, Zimmerman and Fein 2008; see also Ward 1983). Specifically, in Giora, Zimmerman and Fein (2008), negated comparisons and their affirmative counterparts (*Saddam Hussein was/wasn't like Hitler*), came across as similarly appropriate. In addition, reference to a salient, prototypical feature of a negated concept (*a well known masterpiece* in *Susie's drawing is **not the Mona Lisa**. Susie's drawing is not **a well known masterpiece***) elicited higher appropriateness ratings and faster reading times compared to a less prototypical feature (*Susie's drawing didn't warrant **a parody by Marcel Duchamp***). Their respective controls, however, in which the context sentence was unrelated (*Susie's drawing is not the armored corps*), were rated as least appropriate and took longest to read.

Similarly, it is this accessibility that allows negative categorizations to come across as affirmative categorizations, obeying same categorization constraints. Thus, like affirmative conjunctions, negative ones (*What I bought yesterday was not a bottle but a jug*), which obey categorization principles, were found acceptable. In contrast, negative conjunctions which do not (*What I bought yesterday was not a bottle but a closet*) were unacceptable (Giora, Balaban et al. 2005: Ex. 2). By the same token, it is this accessibility that allows negated concepts (*apple* in *Justin bought a mango but not an apple. He ate the fruit*) to interfere with anaphor resolution (*fruit*) when the antecedent (*mango*) was not a prototypical member of the

set (Levine and Hagaman 2008; Shuval and Hemforth 2008); it is this accessibility that allows negation to also serve as an enhancer, highlighting information within its scope (*Who wasn't there in the coronation balls in Little Rock and Washington? **All the who's and who's** in the entertainment industry*) as shown by studies of Hebrew expletive negation (Eilam 2009, Giora 2006: 993).

This retention of negated concepts applies equally well to visual negation markers (e.g., a cross or a line) superimposed on visual percepts. In Giora, Heruti, Metuki and Fein (2009), we show that when presented with a crossed over image (an open door with a cross superimposed on it) and asked to select the appropriate interpretation, participants did not select the one that manifested an alternative opposite (***Close** the door!*). Instead, they opted for the interpretation which included mention of the negated concept (*Don't leave the door **open**!*). Visual negation, then, is processed along the same lines as verbal negation. It does not unconditionally invoke suppression of negated concepts even when an alternative opposite is available. Rather it retains the concept within its scope which partakes in the representation of the visually negated stimulus. This study into the processes involved in interpreting visually negated percepts suggests that both suppression and negation are general cognitive processes not specific to linguistic systems only.

It is this accessibility of negated concepts that also allows them to "resonate" with related concepts in their environment, that is, to activate affinities across utterances (Du Bois 2001), as shown for affirmative concepts (see Du Bois 2001); it is this accessibility of negated concepts that allows activating an array of linguistic and conceptual elements in one speaker's utterance which "resonate" with elements in hers or another's in both prior and late context, as shown by both studies of natural discourses (Giora 2007) and lab results (Giora et al. 2007).

To illustrate, consider the following example which features a concept within the scope of negation (***don't** give away even a slight **quiver** of a [combat aircraft's] wing*)[5], which nonetheless resonates with prior context (*earthquake*):

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[5] This is a reference to Dan Haluz's admission (following the killing of 14 Palestinian civilians by the Israeli Air Force, which he headed at the time) that when he drops a bomb all he feels is a slight quiver of the aircraft's wing.

(2)   For months they tell us about an "earth**quake**" [the 2nd Lebanon war]. But the memorials have a mind of their own as if bereavement is a natural disaster or fate, and they do**n't** give away even a slight **quiver** of a [combat aircraft's] wing.   (Misgav 2007)

As for forward resonance, consider the title of the article of the example cited above. This title – *Not a quake and not a quiver* – demonstrates forward resonance in which a given negated concept (*Not a quake*) resonates with, that is, activates affinities with the next negated concept, appearing in its late context (*not a quiver*).

Forward resonance allowed by negated concepts (*no monument and no memorial*) can also make accessible an affirmative (related) concept (*grave*). This is afforded only by the retainability of the concept within the scope of negation:

(3)   [T]he time has come to ask Kastner's forgiveness. Perhaps this important film [*Killing Kastner* by Gaylen Ross] will carry out the historical task, in a place where Kastner has **no monument** and **no memorial**, except for his **grave**.   (Levy 2008)

A recent event-related fMRI study further demonstrates that negation and affirmation need not exhibit asymmetrical behavior, since how they are processed often depends on their context (task included). Looking into the neural substrates of making negative and affirmative decisions about semantic relatedness, Stringaris, Medford, Giora, Giampietro, Brammer and David (2006) show that rejecting and endorsing semantic relatedness activates similar brain areas when related (*honesty*) and unrelated (*meetings*) probes are presented following (conventional) metaphors (*Some answers are **straight***). This, however, is not the case when related (*passion*) and unrelated (*meetings*) probes are presented following literals (*Some answers are **emotional***). More specifically, findings show that both rejecting a relation (saying "no" to *meetings*) and endorsing it (saying "yes" to *honesty*) following open-ended polysemous words (*straight*) invoke a similar search for (a wide range of) associations, activating the right ventrolateral prefrontal cortex (see Figure 1, images a and c). However, a non-open-ended, non-polysemous (literal) context (*emotional*) exhibits a neural asymmetry between negative and affirmative responses, activating different brain areas (see Figure 1 images b and d), showing that only endorsement involves a search for associations:

"No"   "Yes"
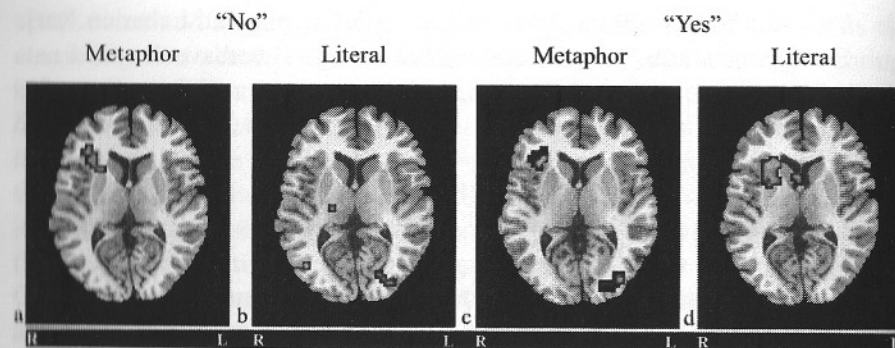Metaphor   Literal   Metaphor   Literal

Figure 1. Right Frontal Cortex activation following metaphor: (a) Rejection ("No");
(c) Endorsement ("Yes")

Most of our previous studies, then, have argued that, contra the received view, negation and affirmation are functionally equivalent, because negation allows activation and retention of information within its scope (Giora 2006). In contrast to our previous research, however, this chapter focuses on one of the most intriguing asymmetries between negatives and affirmatives. Still, even this asymmetry relies heavily on the accessibility of information within the scope of negation.

In what way is this asymmetry unique? Although pragmatic and psycholinguistic studies of negation have demonstrated that negation might have a great number of effects (see Horn 2001), they all, however, have been shown to share a common feature. They all seem to mostly operate on an affirmative concept so that that concept ("X" in "Not X") undergoes some modification while being negated. This simply amounts to saying that negative constituents have been often shown to be semantically and pragmatically a derivative – the consequence of an operation on the (more basic, unmarked) affirmative. As shown earlier, "not clear", for instance, might mean any of the following: 'less than clear', 'not clear enough', 'should be clearer', 'a disagreement that it is clear', 'kind of vague', 'vague', etc.. In such cases, negation induces a variety of weakening effects of the affirmative X, ranging between slightly (less than 'clear') to wholly mitigating X to the extent that X is suppressed and replaced by an alternative opposite Y ('vague'). This is particularly true of scalar adjectives and predicates (Fraenkel and Schul 2008; Giora 2006; Giora, Balaban, Fein and Alkabets 2005; Hasson and Glucksberg 2006; Horn 1989/2001; Paradis and Willners 2006, inter alia).

The kind of negative utterance we focus on here is, however, different. It includes a set of negative utterances of the form "X is not Y" (*I am not your*

maid; This is not food) that pragmatically are not derivable from their affirmatives. That is, their negative interpretation is radically different from their affirmative interpretation. Whereas the affirmative version of these utterances mostly gives rise to non-metaphoric interpretations, the negative versions mostly induce metaphoric interpretations.

How do people go about processing such negative utterances? What is the default context they activate to render such negative statements plausible? As will be seen later, to render such statements meaningful, speakers often activate a context in which the predicate (*not your maid; not food*) is related to the topic (*I, This*) in a nonliteral way. For instance, in the following examples (4)–(5), what the speaker means by the negated utterances (with bold highlighting added) is fleshed out later on (italicized, for convenience), making clear that, in both cases, the information within the scope of negation is intended metaphorically. That is, it is not the literal interpretation of either *your maid* ('an employed woman hired to do her job') or *food* ('foodstuff') that is dismissed here, but rather the nonliteral interpretation of these concepts ('someone that you can lay your demands [on] all of [the] time'; 'foodstuff fit for human consumption'). Put differently, it is not metaphor-irrelevant ('foodstuff') meanings that are rejected here but rather salient (Giora 1997, 2003; Ortony, Vondruska, Foss and Jones 1985), metaphor-relevant features ('fit for human consumption') that are dismissed, yet not at the cost of being dispelled from the mental representation:

(4)   You tell me what to do all of the time, what to say, where to hide, and what to do. *I am not your wife* **I am not your maid**, *I'm not someone that you can lay your demands [on] all of [the] time, I'm sick of this it's going to stop!*   (Blige 2007)

(5)   "Tell TBS **this is not food**. They should concentrate on checking upon foodstuff imports many of which are *expired or sub-standard or unfit for human consumption*," said stall holder Saidi Abdallah Umbe.
                                                                            (BBC News 2003)

How do people make sense of the affirmative counterparts of these statements? What is the default context affirmative utterances such as *I am your maid, This is food* activate to render these statements plausible? As will be seen later, to render such statements meaningful, speakers often activate a context in which the predicate (*your maid; food*) is related to the topic (*I, This*) in a literal way, that is, in a way that also communicates or assumes metaphor-irrelevant meanings ('a woman employed to do certain jobs'; 'foodstuff to be eaten'; italicized, for convenience):

(6)   "No, mum. **I am your maid**. It is *you, who picked me*. It is *my job to attend to you*, mum."   (Summerfield 1998)

(7)   **This is food,** and this is how you *eat* it.   (Chamberlain 2005)

In this chapter we focus on this set of negative utterances which we term "negation-induced metaphors" (4, 5), and their affirmative counterparts (6, 7). Unlike regular metaphors, which communicate metaphoricity in both their affirmative and negative versions (Hasson and Glucksberg 2006, Keil 1979), this set of metaphors is unique. Pragmatically, negation-induced metaphors are not derived from their affirmative versions. Whereas the default interpretation of the affirmative versions is literal, the negative versions are by and large metaphoric. Like examples (4–7) above, the following examples (8–9) are illustrative: their (a) versions feature negation-induced metaphors (in bold) and instantiations/explications of their metaphoric interpretations (in italics); their (b) versions feature equivalent affirmative versions, whose interpretation is literal (in bold) accompanied by instantiations/explications of their literal interpretations (in italics):

(8)   a.   If you do not want to attend the class please drop it or let yourself get an 'F'. **I am not your secretary** *to file all the documents and keep track of the learning materials for you.*   (Student 2008)

      b.   Hi everyone! My name is Stephanie Zguris and **I am your secretary**! *If you ever miss a meeting or want to know about upcoming meetings or events, I am the one to talk to!*   (Zguris 2008)

(9)   a.   *Don't ever tell me that "I better do something on my blog."* **You are not my boss** *so don't tell me what to write.*   (Joan 2008)

      b.   No keeping someone on staff. No extra payroll costs. No third party human resource company. This means *I work for you*, and **you are my boss**.   (Banda 2008)

At first glance, one might suspect that negation-induced metaphors are negative polarity items (NPIs), items exhibiting asymmetric behavior in minimal pairs of negative and affirmative sentences (Israel 2004). Admittedly, on the face of it, there is some striking resemblance. Like polarity items, they do exhibit asymmetric behavior in minimal pairs of negative and affirmative sentences: Whereas the negative utterances are primarily metaphoric, their affirmative versions are primarily literal.

However, despite this superficial similarity, negation-induced metaphors differ from NPIs in various respects. First, NPIs are typically highly con-

ventional/fossilized and appropriate whereas their affirmatives are not and are often nonexistent (Horn 1989: 49). By contrast, negation-induced metaphors need not be conventional. Instead, they can be entirely novel, their metaphoric interpretation constructed on the fly (see Experiment 3 below). Additionally, their affirmative counterparts are prevalent and appropriate, only intended to convey a different (literal) sense.

What, then, allows negation to generate figurativeness? Using affirmative and negative statements (such as 4–9 above), the present study tests the hypothesis that, among other things, negation generates figurativeness via highlighting metaphor-related features of the affirmative concept within its scope, while rendering its metaphor-unrelated (literal) features pragmatically irrelevant, regardless of whether they are true or false. Negating an affirmative concept, then, may enhance its salient/distinctive properties which may then be attributed to the topic of the (negative) statements.[6]

For example, by negating **food, wife, maid, secretary,** or **boss** etc. (see 4–5; 8a–9a above), the speaker enhances metaphor-relevant properties (italicized) where, for example, **not food** means [*food*] *unfit for human consumption;* **not your wife, not your maid** means *not someone that you can lay your demands[on] all of [the] time;* **not your secretary** means [*will not*] *file all the documents and keep track of the learning materials for you;* **not my boss** means *don't tell me what to write* etc. By bringing out the features of the source domain (*food, wife, maid, secretary, boss*), whether they are made explicit or need to be inferred, negation allows their attribution to the target domain (*this, I, you*) while rejecting its applicability. (On metaphor residing in attributing features of the source domain to the target domain, see e.g., Glucksberg 1995, Glucksberg and Keysar 1990).

It should be noted that, so far, the present hypothesis relates to utterances of the form "X is not Y" where X is a high accessibility referring expression (a pronoun), and hence hardly informative (Ariel 1990), and Y is a noun phrase.

It should be noted further that the source domain features attributable to the target domain need not be of superordinate abstraction level (as assumed by Glucksberg and Keysar 1990).[7] They should, however, share a

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6   On the process involved in ordinary metaphors whereby metaphor-related features are attributed to the topic (or target) of the metaphoric statement, see Glucksberg (1995).

7   On metaphor-irrelevant meanings as pertaining to superordinate abstractions and metaphor-relevant meanings as pertaining to lower level abstractions, see e.g. Gernsbacher, Keysar, Robertson and Werner (2001), Rubio Fernández (2007).

common feature and be classifiable under a common superordinate category. For instance, while **not your secretary** (8a) could mean [*will not*] *file all the documents and keep track of the learning materials for you* or *will not print out and staple your work*,[8] these features should be categorizable as, for example, instances of 'servility' typical of secretarial assistance.

In three experiments involving native speakers of Hebrew (Section 2) and corpus-based studies examining equivalent English, German, and Russian utterances (Section 3), we test the hypothesis that some negative utterances (see 4, 5, 8a, 9a for typical constructions) tend to be interpreted nonliterally, even when no specific context is provided. Specifically, we aim to show that negation functions as a metaphor-inducing operator – a device that enhances the figurative interpretation of the concept it rejects, while rendering its literal interpretation pragmatically irrelevant to the interpretation process.

In Experiment 1, participants were instructed to decide whether context-less affirmatives (*I am your maid; this is food*) and their negative counterparts (*I am not your maid; this is not food*) communicate either a literal or a metaphoric interpretation. Experiment 2 compared affirmative (*almost*) and negative (*not*) modifiers in order to demonstrate that a negative but not an affirmative modifier is a metaphor-inducing device. Participants were presented affirmative statements (*I am almost your maid; this is almost food*) and their negative counterparts (*I am not your maid; this is not food*) and were asked to rate the extent to which they were (non)literal.

Because many of the negative items of Experiments 1–2 could be rather familiar, Experiment 3 used only highly novel negative statements (**This is not Memorial Day; I am not your doctor**) and their equally novel affirmatives (**This is Memorial Day; I am your doctor**). Design and procedure were the same as in Experiment 2.

Findings, demonstrating the prevalence of figurative meanings in negative but not in affirmative constructions, are then corroborated by naturally occurring uses which also demonstrate the way in which the discourse environment of these negative items resonates with their metaphoric interpretation (Section 3).

On metaphor vehicles representing superordinate categories, see Glucksberg and Keysar (1990), Shen (1992).

[8] http://iweb.tntech.edu/kosburn/history-202/Cause%20and%20effect.htm (retrieved July 27, 2008)

2. Experimental data

Experiment 1

The aim of Experiment 1 was to test the hypothesis that negation enhances metaphor-related properties. Specifically, it tests the prediction that, when having to decide whether a statement is intended either literally or metaphorically, participants will opt for the metaphoric interpretation when encountering a negative statement but significantly less so when encountering its affirmative counterpart.

Method

Participants. Forty-eight students of linguistics at Tel Aviv University (33 women, 15 men), mean age 24.4 years old, volunteered to participate in the experiment.

Materials. Materials included 24 context-less affirmatives (*I am your maid; this is food*) and their negative counterparts (*I am not your maid; this is not food*). Two booklets were prepared so that each participant would be presented with only one item of a pair. Each booklet included 12 affirmative items, 12 negative items and 17 filler items, about half of which were negative (*I am not hungry now*).

Procedure. Participants were instructed to decide whether each of the items either communicates a literal or a metaphoric interpretation. No participant saw more than one version of each item.

Results and Discussion

As predicted, comprehenders opted for the metaphoric interpretation Thin when they were judging the negative items but significantly less so when they were judging the affirmative items, which tended to be interpreted literally. Specifically, the mean probability of negative items to be judged as metaphoric was higher (68%) than the mean probability of their affirmative versions (43%). The difference was significant in both subject (t_1) and item (t_2) analyses, ($t_1(47)=7.09$, $p<.0001$; $t_2(23)=7.19$, $p<.0001$). Results thus support the view that negation, can, indeed, function as a metaphor inducing operator.

Since we forced comprehenders to choose between two alternatives and did not allow them a chance to grade their responses or even decide on another response, we ran another experiment. In Experiment 2, participants were asked to rate the interpretation of the targets on a 7 point scale ranging between two specific (either literal or metaphoric) interpretations. In addition to these interpretations or as an alternative, they were allowed to come

up with an interpretation of their own. This experiment focused on comparing negative items (involving the negative modifier "not") and their affirmative alternatives (involving the affirmative modifier "almost"[9]). This experiment thus allows us to compare negatively and affirmatively marked versions of utterances.

Experiment 2

The aim of Experiment 2 was to show that even when allowed a wider range of choices, comprehenders find the negatively marked items more metaphoric than their affirmative counterparts.
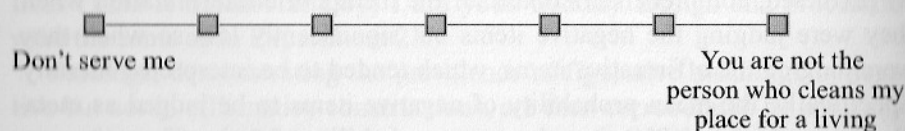
Method

Participants. Participants were 24 students at Tel Aviv University (9 women and 15 men), mean age 25.3 years old who volunteered to participate in the experiment.
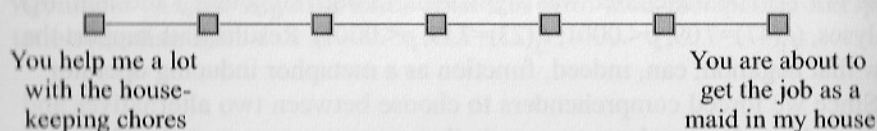
Materials. Materials included 16 items involving a negative modifier (***You are not my boss***) and their counterparts including an affirmative modifier – almost (***You are almost my boss***). Two booklets were prepared so that each participant would be presented with only one item of a pair. Each booklet included about 8 affirmative items, 8 negative items and 7 similar filler items.

Each item was followed by a 7 point scale which featured two different interpretations – either literal or metaphoric – presented randomly at each end of the scale:

(10) **You are not my maid**

☐——☐——☐——☐——☐——☐——☐

Don't serve me   You are not the person who cleans my place for a living

(11) **You are almost my maid**

☐——☐——☐——☐——☐——☐——☐

You help me a lot with the housekeeping chores   You are about to get the job as a maid in my house

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[9] Although *almost* entails negation (see Horn, 2002, 2009 and references therein), it is considered here an affirmative modifier, because it is not overtly marked for negation.

Procedure. Participants who agreed to take part in the experiment were sent an electronic booklet. They were asked to rate, on a 7 point scale, whose ends instantiated either a literal (=1) or a metaphoric (=7) interpretation of each item, the proximity of the interpretation of the item to any of those instantiations at the scale's ends. In case they did not agree with both interpretations, they were allowed to come up with an interpretation of their own.

Results and Discussion

Since there were only 16 cases out of 384 (4%) in which participant offered their own interpretations, we did not include them in the analysis. Negative statements were rated as more metaphoric (M=6.02, SD=0.65) than their affirmatives counterparts (M=5.59, SD=0.70). The difference was significant in the subject (t_1) analysis, and marginally significant in the item (t_2) analysis ($t_1(23)=2.50, p<.01; t_2(15)=1.56, p=.07$).

In all, results of Experiments 1–2 show that, as assumed, negation generates metaphoricity. When faced with an either/or choice, participants decided on a metaphoric interpretation for the negative but not for the affirmative items (Experiment 1). When allowed a graded choice, they attributed a metaphoric interpretation to the negative rather than to the affirmative items (Experiment 2).

Because many of the negative items of Experiments 1–2 are used metaphorically quite frequently, we designed Experiment 3, in which novel negative statements (***This is not Memorial Day; I am not your doctor***) and their equally novel affirmatives (***This is Memorial Day; I am your doctor***) were tested.
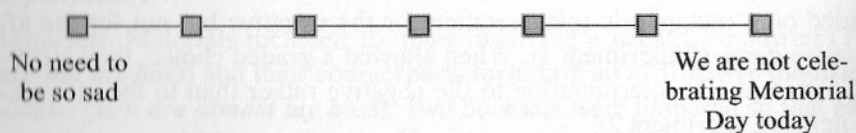
Experiment 3

Method

Participants. Participants were 48 students and high-school graduates (31 women and 17 men), mean age 25.6 years old who either volunteered to participate in the experiment or were paid 15 Israeli shekels (about $4).

Materials. To ensure that we use only novel metaphors, we ran a pretest, in which 31 affirmative utterances and their negative counterparts were rated for familiarity by 50 participants (students and high-school graduates). Two booklets were prepared so that each participant would be presented only one item of a pair. Each booklet included about 15 affirmative items, 15 negative items, and 15 filler items (familiar metaphors, half of which were negated) which were the same for both booklets.
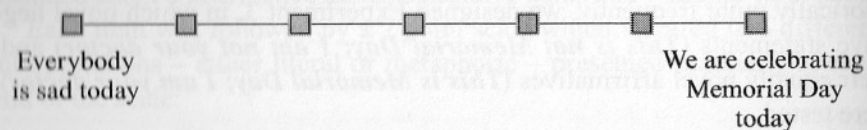
Participants were asked to rate the items' familiarity on a 7 point familiarity scale ranging from 1 ("Not familiar at all; Never heard it") to 7 ("Highly familiar; I hear it all the time"). For the actual experiment, 15 items were selected, those that scored below 4 (in both the affirmative and negative versions) and which, in addition, had similar familiarity ratings for the affirmative and negative versions, as shown by t-tests, which did not reveal any significant differences (p value was always above .20).

Materials for the actual experiment, then, were the 15 novel affirmatives and their (equally novel) negative counterparts, selected on the basis of the pretest's results described above. Two booklets were prepared so that each participant would be presented only one item of a pair. Each booklet included 7 or 8 affirmative items and 7 or 8 negative items, modeled after the presentation of items in Experiment 2 (see 12–13), and 15 filler items (familiar metaphors, half of which were negated):

(12) **This is not Memorial Day**

No need to
be so sad

We are not celebrating Memorial
Day today

(13) **This is Memorial Day**

Everybody
is sad today

We are celebrating
Memorial Day
today

Procedure. As in Experiment 2.

Results and Discussion

Since there were only 27 cases out of 720 (3.8%) in which participants offered their own interpretations, we did not include them in the analysis. Results show that novel negative statements were rated as more metaphoric (M=5.50, SD=0.96) than their affirmative counterparts (M=3.48, SD=1.27). The difference was significant in both subject (t_1) and item (t_2) analyses ($t1(47)$=10.17, p<.0001; $t2(14)$=4.36, p<.0005).

Overall, results from novel and familiar utterances (of the form "This is not..."; "I am not..."; You are not..."), where the topic is a pronoun hardly informative about the specific nature of the referent and the predicate includes a noun phrase, support the view that negation generates figurativeness as a default interpretation.

3. Corpus data

If negation indeed generates figurativeness as a default interpretation, we should be able to show that natural instances of some negative items (of the form "This is not..."; "I am not..."; "You are not...") are used figuratively more often than their affirmative counterparts. Since Experiments 1-3 providing support for this hypothesis were run in Hebrew, we tested its predictions on other languages such as English, German, and Russian. To do that, we selected a few examples and searched their first ~50 occurrences in both their affirmative and negative versions, using engines such as Google, Yahoo, Start, MSN, and Netex. We first studied their interpretations: On the basis of their context, 2 judges (a research assistant and the first author) decided whether each utterance was used either figuratively or literally. Agreement between judges was high overall, and all differences were resolved after a discussion. We expected these negative items to be considered figurative more often than their affirmative counterparts (3.1).

Second, we studied their context and how it reflects their interpretations: the same judges looked at the negative items' environment to see the extent to which contextual information resonates with either the metaphoric or the literal interpretation of the negative items. Again, agreement between judges was high overall, and all differences were resolved after a discussion. We expected the environment of the negative items to reflect their metaphoric interpretation to a greater extent than their literal interpretation (3.2).

3.1. Distribution of metaphoric and literal interpretations

Corpus-based studies were run in 3 languages: English, German, and Russian. Findings of these studies are presented in Table 1 (English), Table 2 (German), and Table 3 (Russian), and in Figures 2–4 accordingly. As predicted, they demonstrate that, invariably, the negative versions are more metaphoric than their affirmative counterparts, as shown by z-ratio tests for the difference between two independent proportions (proportion of metaphoric interpretations of Negative vs. Affirmative statements). They further show that the negative versions are primarily metaphoric, that is, used metaphorically more often (i.e., in more than 50% of the cases) than literally and that, by the same token, the affirmative versions are primarily literal (i.e., used metaphorically in less than 50% of the cases). This is strikingly true of almost all items:

Table 1. Proportions of metaphoric interpretations of negative vs. affirmative utterances in *English* and results of z-ratio tests for the difference between them

	Negative	Affirmative	z-ratio, significance
I am not your maid / I am your maid	90.4% (47/52)	30% (15/50)	6.24 **
I am not your secretary / I am your secretary	95.7% (44/46)	12% (6/50)	8.20 **
You are not my mom / You are my mom	36% (18/50)	6% (3/50)	3.68 **
I am not your mom / I am your mom	50% (25/50)	16% (8/50)	3.62 *

* p<.0005, ** p<.0001

Table 2. Proportions of metaphoric interpretations of negative vs. affirmative utterances in *German* and results of z-ratio tests for the difference between them

	Negative	Affirmative	z-ratio, significance
Das ist kein Essen (This is not food) / Das ist Essen (This is food)	80% (20/25)	12.8% (6/47)	5.66 **
Das ist kein Spiel (This is not a game) / Das ist ein Spiel (This is a game)	66% (33/50)	22% (11/50)	4.43 **
Du bist nicht meine Mutter (You are not my mom) / Du bist meine Mutter (You are my mom)	82% (41/50)	20% (10/50)	6.20 **
Ich bin nicht deine Mutter (I am not your mom) / Ich bin deine Mutter (I am your mom)	65.9% (29/44)	12% (6/50)	5.40 **

* p<.0005, ** p<.0001

Table 3. Proportions of metaphoric interpretations of negative vs. affirmative utterances in *Russian* and results of z-ratio tests for the difference between them

|	Negative	Affirmative	z-ratio, significance
Я не твоя секретарша (I am not your secretary) / Я твоя секретарша (I am your secretary)	85% (17/20)	20% (6/30)	4.52 **
Он не мой сын (He is not my son) / Он мой сын (He is my son)	80% (40/50)	2% (1/50)	7.93 **
Ты не моя мама (You are not my mom) / Ты моя мама (You are my mom)	24% (12/50)	0% (0/50)	3.69 **
Я не твоя мама (I am not your mom) / Я твоя мама (I am your mom)	72% (36/50)	10% (5/50)	6.30 **
Это не моё тело (This is not my body) / Это моё тело (This is my body)	80% (40/50)	12% (6/50)	6.82 **

* p<.0005, ** p<.0001

English Data
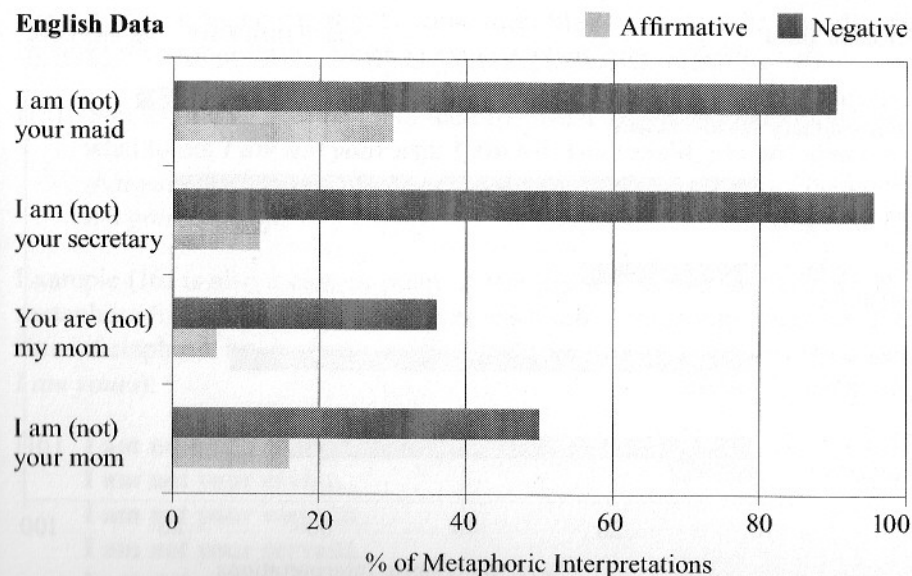
Figure 2. Percentage of Metaphoric interpretations of Affirmative vs. Negative Utterances – English
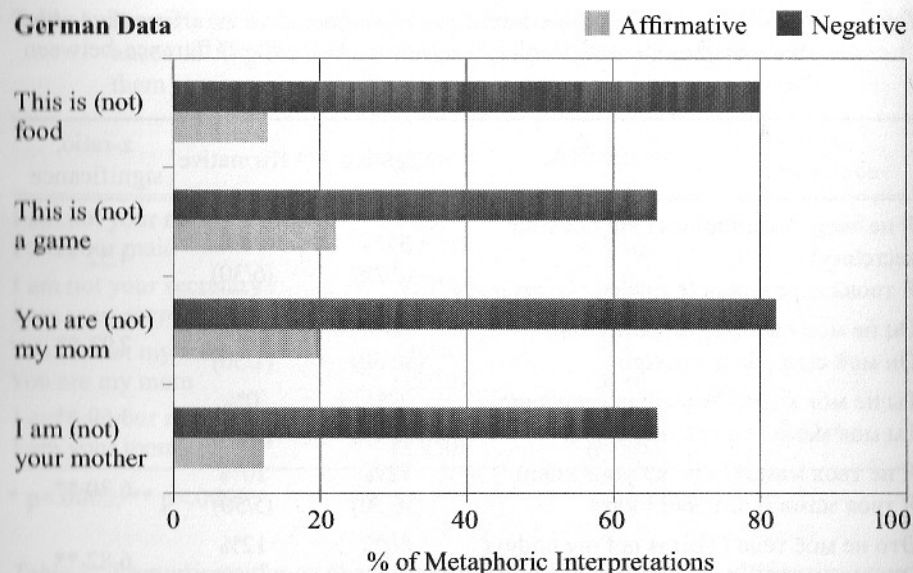
German Data

Figure 3. Percentage of Metaphoric interpretations of Affirmative vs. Negative
Utterances – German
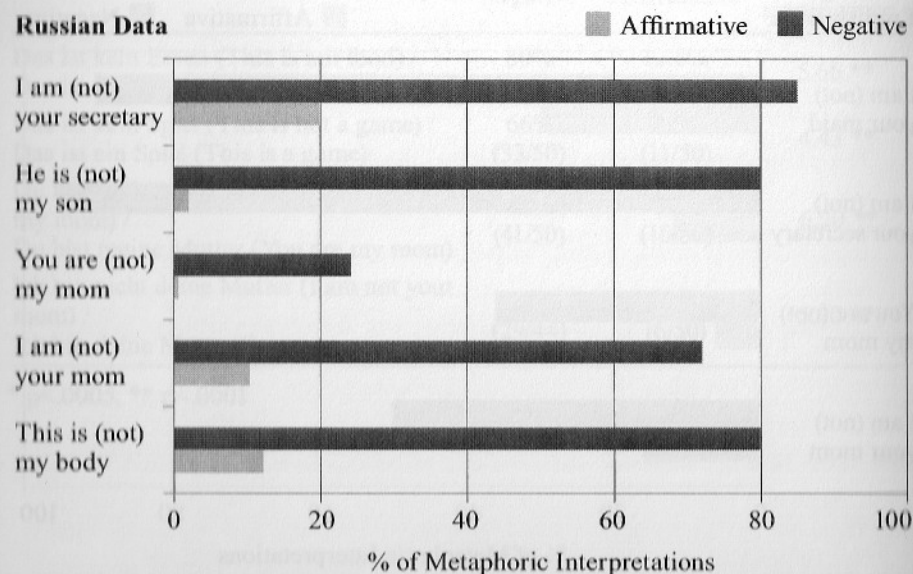
Russian Data

Figure 4. Percentage of Metaphoric interpretations of Affirmative vs. Negative
Utterances – Russian

3.2. Environment of negative items – findings

Given that negative utterances of the form X is not Y (where X is a pronoun
and Y is a noun phrase) are primarily metaphoric, we expect linguistic
elements in their environment to resonate (à la Du Bois 2001) with their
metaphoric rather than literal interpretation. Moreover, since these utter-
ances often express a kind of a complaint (see 14) afforded by the negation,
we expect their resonance effect to be rather intense. This can be achieved
either by generating similar metaphors expressing the same negative stance
or by explicating what is communicated by them:

(14)   She was the principal in a high school; I feared her and respected her
       for her cleverness and professionalism. She brought me to the elemen-
       tary school, and trained me to be independent, and punished me when
       I did something wrong as well. Often I **complained** from my heart,
       "**you are not my mom**."   (Irene 2000)

An instance of the environment of negative items can be found in example
(4) above, which features the metaphoric *I am not your maid* (repeated in 15,
for convenience). It is illustrative of both, the way the context resonates with
the (target) metaphor (*I am not your maid*) via a prior negative metaphor (*I
am not your wife*), conveying the same meaning (bolded and italicized) and
by what it communicates, which is made explicit later on (*italicized*):

(15)   You tell me what to do all of the time, what to say, where to hide, and
       what to do. ***I am not your wife* I am not your maid**, *I'm not someone
       that you can lay your demands [on] all of [the] time, I'm sick of this
       it's going to stop!*   (Blige 2007)

Example (16) is also a case in point. It features a great number of negative
metaphors (in bold) all resonating with each other, intending to convey the
same metaphoric interpretation, which is then made explicit (*does not mean
I am yours*):

(16)   **I am not your therapist.**
       I am not your savior.
       I am not your way out.
       I am not your servant.
       I am not your secretary.
       I am not your mother.
       I am not your whore.

I am not your entertainment.
I am not your encyclopedia.
I am not your babysitter.

Just because I love you *does not mean I am yours.*   (GUCK 2001)

Having shown that the negative items we studied are metaphoric (Sections 2, 3.1), we expect, then, that the context of these negative metaphors will abound in either or both: (a) uses of similar metaphors which communicate the same metaphoric interpretation; (b) explications of the metaphoric interpretation. Crucially, we expect metaphoric resonance to outweigh literal resonance (examples of the latter can be found in (17)–(18), italicized for convenience):

(17)   User: Umm. I may have to go soon…
       Jabberwacky: Oh, you're not going anywhere.
       User: In a minute I'll scream.
       Jabberwacky: **I'm not your maid.**
       User: *No, but I'm sure you'd make a great maid!??*
                                                     (thisfred 2004)

(18)   1. **You are not my boss.**
       2. *If you were my boss, we would have a serious discussion about THE MONEY.*[10]

Corpus-based findings concerning the kind of contextual resonance with negative metaphors are presented in Table 4 (English), Table 5 (German) and Table 6 (Russian), and in Figure 5 (English) and Figure 6 (German and Russian). They are divided between "Only metaphoric resonance" results, where context resonated only with the metaphoric interpretation of the target negative statement; "Only literal resonance" results, where context resonated only with the literal interpretation of the target negative statement; "Both metaphoric and literal resonance" results, where context resonated with both the metaphoric and literal interpretations of the target negative statement; and "No resonance" results, where context did not resonate with any interpretation.

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10 http://multiplex.integralinstitute.org/Public/cs/forums/11/54536/ShowThread.aspx (Retrieved June 9, 2008).

Findings show that, overall, the environment of negative metaphors reflects their metaphoric interpretation rather than their literal interpretation. For instance, the environment of *I am not your maid* (first raw of Table 4) resonates with its metaphoric interpretation in 74.5% (35/47) of the cases, while its literal interpretation is resonated with in only 25.5% (12/47).

However, *p*-values presented in the tables, are the results of Exact Binominal Probability tests, performed in each case for "Only metaphoric resonance" against "Only literal resonance". They test whether the probability of getting metaphoric resonance is significantly higher than chance level (50%). For example, in "I am not your maid", from the 35 occurrences with "Only metaphoric" and "Only literal" resonance, "Only metaphoric" resonance occurred 29 times (82.9%), which is significantly higher than 50% (p<.005). In all the cases, the superiority of the metaphoric resonance was evident, and only in one case ("I am not your maid" in Russian) it was not significant.

The figures present occurrences in which metaphoric or literal resonance appeared. That is, "metaphoric resonance" is the sum of "Only metaphoric resonance" and "Both metaphoric and literal resonance". The same holds for "literal resonance". As shown by the figures, in all the cases, except for the two Russian examples (which, in all, exhibited poor resonance), the environment included metaphoric resonance in more than 50% of the cases.

Table 4. Distribution of different types of resonance in the environment of negative utterances in English and results of exact binominal probability test for the superiority of metaphoric resonance

	Only Metaphoric resonance	Only Literal resonance	Both Metaphoric and literal resonance	No resonance	p-values
I am not your maid	61.7% (29/47)	12.8% (6/47)	12.8% (6/47)	12.8% (6/47)	p<.0005
You are not my mom	55.6% (10/18)	5.6% (1/18)	27.8% (5/18)	11.1% (2/18)	p<.01
I am not your secretary	79.5% (35/44)	4.5% (2/44)	9.1% (4/44)	6.8% (3/44)	p<.0005

Table 5. Distribution of different types of resonance in the environment of negative utterances in German and results of exact binominal probability test for the superiority of metaphoric resonance

	Only Metaphoric resonance	Only Literal resonance	Both Metaphoric and literal resonance	No resonance	p-values
Ich bin nicht deine Mutter (I am not your mom)	58.6% (17/29)	3.5% (1/29)	13.8% (4/29)	24.1% (7/29)	p<.0005
Du bist nicht meine Mutter (You are not my mom)	63.4% (26/41)	4.9% (2/41)	17.1% (7/41)	14.6% (6/41)	p<.0005
Das ist kein Essen (This is not food)	40% (14/35)	5.7% (2/35)	14.3% (5/35)	40% (14/35)	p<.005
Das ist kein Spiel (This is not a game)	54.5% (18/33)	3% (1/33)	15.2% (5/33)	27.3% (9/33)	p<.0005

Table 6. Distribution of different types of resonance in the environment of negative utterances in Russian and results of exact binominal probability test for the superiority of metaphoric resonance

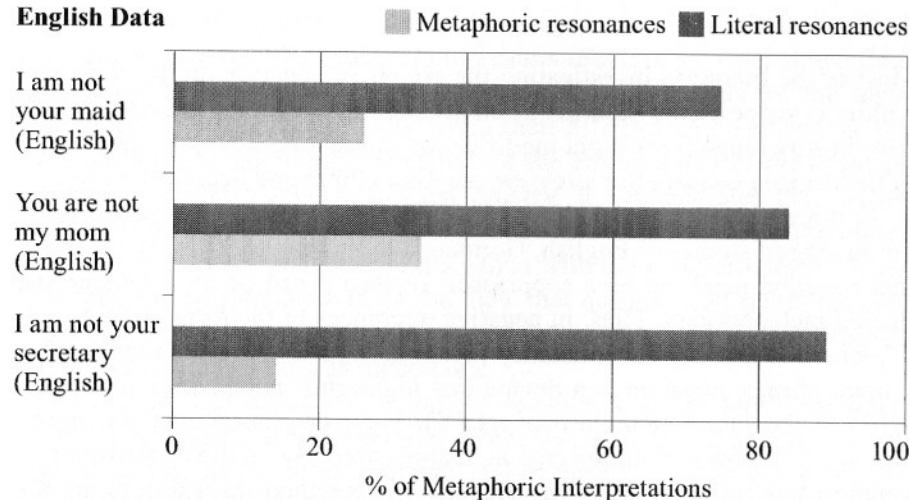|	Only Metaphoric resonance	Only Literal resonance	Both Metaphoric and literal resonance	No resonance	p-values
Я не твоя секретарша (I am not your secretary)	20% (4/20)	5% (1/20)	5% (1/20)	70% (14/20)	p=.19
Я не твоя мама (I am not your mom)	12% (6/50)	0% (0/50)	2% (1/50)	86% (43/50)	p<.05

English Data

Figure 5. Percentage of Metaphoric vs. Literal Resonance in the Environment of Negative Utterances – English
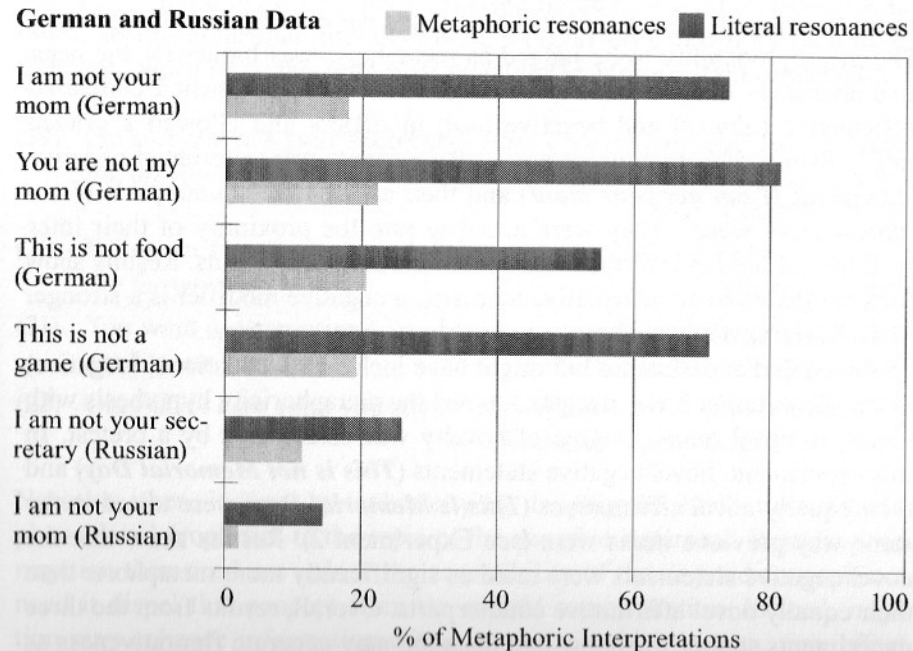
German and Russian Data

Figure 6. Percentage of Metaphoric vs. Literal Resonance in the Environment of Negative Utterances – German and Russian

4. General discussion

Most of the literature investigating the effects of negation on the concepts within its scope views negation as an accessibility-reducing operator. Its effects mostly range from slight modification (mitigation) to total suppression of the negated concept (for a review, see Giora 2006 and Section 1 above).

In three experiments conducted in Hebrew (Section 2), accompanied by corpus-based studies of English, German, and Russian (Section 3), we show that negation need not be a suppressor. Instead it can be an enhancer, inducing metaphoricity. Thus, in negative utterances of the form of "X is not Y", where X is a high accessibility referring expression (a pronoun) and Y a noun phrase, negation is a device that highlights metaphor-related properties of the source domain concept (Y). Their projection onto the target domain (X), however, is rejected as inapplicable. By contrast, affirmative counterparts come across as significantly less metaphorical since, in the absence of an enhancer, metaphor-related features are not brought out.

In Experiment 1, participants were instructed to decide whether context-less negatives (***I am not your maid***) and their affirmative counterparts (***I am your maid***) have either a literal or a metaphoric interpretation. Findings show that negative but not affirmative items were interpreted figuratively: The mean probability to be judged as metaphoric was higher for the negative utterances than for their affirmative versions. Experiment 2 compared affirmative (*almost*) and negative (*not*) modifiers and allowed a graded rather than a dichotomous response. Participants were presented negative statements (***I am not your maid***) and their affirmative counterparts (***I am almost your maid***). They were asked to rate the proximity of their interpretation of the items to those instantiations at a scale's ends. Results show that, compared to an affirmative modifier, a negative modifier is a stronger metaphorizing device, promoting metaphoric interpretations.

Given that experiments 1–2 might have included conventional (negative) items, Experiment 3 was designed to test the metaphoricity hypothesis with regard to novel items. Degree of novelty was established by a pretest. In this experiment, novel negative statements (***This is not Memorial Day***) and their equally novel affirmatives (***This is Memorial Day***) were tested in the same way previous items were (see Experiment 2). Results show that the novel negative statements were rated as significantly more metaphoric than their equally novel affirmative counterparts. Overall, results from the three experiments support the view that negation may generate figurativeness as a default interpretation (Section 2).

Corpus-based studies in three languages (English, German, and Russian) corroborate the experimental results (Section 3). They show, first, that in various languages speakers use negative statements (of the form mentioned above) metaphorically while their affirmative counterparts are used literally. An additional inspection of the environment of the negative statements further supports this asymmetry. It demonstrates that, as expected, in most of the cases studied, the environment of these utterances resonates with their metaphoric rather than with their literal interpretation. This provides further support for the view that negation can retain the concepts within its scope, which, under certain circumstances, allows negative utterances to come across as metaphoric.

A brief look at instances of implicit negation suggests that even when negation is implied, it has a similar effect (see also the figurativeness ratings following *almost* in Experiment 2). For instance, rhetorical questions, whose implication is negative, such as *What am I, your secretary?/Am I your secretary?* (19)–(20) are used metaphorically (94%, 17/18) rather than literally (6%, 1/18). This is further supported by their environment, which resonates with their metaphoric interpretation (italicized). Similarly, *Am I your mom?/What am I, your mom?* (21)–(22), are also used metaphorically (84%, 16/19) rather than literally (16%, 3/19), as also shown by their environment, which resonates with their metaphoric interpretation (italicized):

(19) I'm sorry? **Am I your secretary?** *Am I even a secretary? So stop handing off your work to me, like you always do, and do it your damn self.*
(Seanzky 2008)

(20) **What am I your secretary?** 😒 *google [age of conan xbox 360] and see for yourself.*
(Robusto 2008)

(21) You want a decsription? *Read the comic and write it yourself.* **What am I, your mom?**
(Mann, retrieved 7 October, 2008)

(22) Oh, *I don't care what you say to who.* **What I am I, your Mom?**
(Victoria "cloroxcowgirl" B., 2008)

Negation, then, induces metaphoricity by denying the attribution of metaphor-related properties to the topic of the negative statement. Rejecting via negation then need not reduce the accessibility of the negated concept, nor need it dispel that concept from the mental representation. Instead, negation may enhance information within its scope, which in turn, may effect metaphoricity.

Acknowledgments

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