

CHAPTER 4

Lexical access in text production

On the role of salience in metaphor resonance*

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1. Introduction

What kind of lexical processes are involved in text production initially? Do they mirror the processes involved in text comprehension? On the face of it, it seems plausible to assume that, at least, in one respect they should not: Since authors know what they have in mind, and since they know their intended meaning prior to the production of the word(s) they select to convey that meaning, they would access only that intended meaning. Text production, it might be assumed, then, would not involve accessing unintended senses of a word selected for expressing a certain meaning or concept (as has been shown for text comprehension, see later). Rather, the word's intended meaning — the one compatible with the context — would be accessed directly. However, since the text producer is also her own comprehender (Levelt 1989, p. 13), text production may very well resemble text comprehension. In this study, we will test this hypothesis with regard to metaphor production in discourse.

Lexical access involved in the very early stages of comprehension has been largely shown to be insensitive to contextual information (see Peleg, Giora & Fein 2001, but see Vu, Kellas & Paul 1998). The main thrust of lexical research into initial processes involved in comprehension and disambiguation has found ample evidence in favor of an exhaustive access model, or a variation of it, exhibiting sensitivity to meaning frequency. According to the exhaustive access model, lexical access is modular: Lexical processes are autonomous and impervious to context effects; all the word's coded meanings are accessed automatically upon its processing, regardless of contextual information or frequency (Fodor 1983; Onifer & Swinney 1981; Rayner, Pacht & Duffy 1994;

This is an offprint from:

Ted Sanders, Joost Schilperoord and Wilbert Spooren (eds.)

Text Representation.

Linguistic and psycholinguistic aspects.

John Benjamins Publishing Company

Amsterdam/Philadelphia

2001

(Published as Vol. 8 of the series

HUMAN COGNITIVE PROCESSING)

ISBN 90 272 2360 2 (Eur.) / 1 58811 077 X (US)

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Swinney 1979). Upon the ordered access version of the model, lexical access is exhaustive but frequency sensitive: The more frequent meaning is accessed first, and search for the intended meaning proceeds only in case the more frequent meaning is incompatible with contextual information (for a review, see Gorfien 1989; Rayner et al. 1994; Simpson 1994). Context, then, affects interpretations only at a later stage and suppresses incompatible meanings (Fodor 1983; Swinney 1979).

The modular view of lexical access has been challenged by a direct access, interactionist hypothesis. According to the direct access model, lexical access is selective. Context directs access completely, so that only the appropriate meaning (of words) is made available for comprehension (Simpson 1981; Glucksberg, Kreuz & Rho 1986; Jones 1991; Martin, Vu, Kellas & Metcalf 1999; Tabossi 1988; Vu, Kellas & Paul 1998).

In the field of figurative language comprehension, the evidence adduced so far apparently supports a direct access model. The prevailing hypothesis is that in a rich and supportive context, figurative and literal interpretation should be accessed directly, without recourse to irrelevant interpretations. Particularly, the intended figurative meanings of metaphors, ironies, and idioms should be tapped directly without having to process the sentence literal meaning at all (see Gibbs 1994 for a review). Similarly, in a context biased toward the literal meaning, only that meaning should be made available for comprehension. Literal and figurative interpretations, then, should involve equivalent processes sensitive to contextual interpretation. They should be processed automatically (Keysar 1989; Gildea & Glucksberg 1983; Glucksberg, Gildea & Bookin 1982), involve the same categorization procedures (Glucksberg & Keysar 1990; Shen 1997), and take equally long to read (Kemper 1981; Inhoff, Lima & Carroll 1984; Ortony, Schallert, Reynolds & Antos 1978).

The picture, however, has not been monolithic. Tapping online processes by measuring reading times at the end of figurative phrases rather than at the end of sentences showed that even when embedded in a context a few sentences long, metaphoric phrases required longer processing times than the same phrases used literally (Janus & Bever 1985). In addition, figurative referring expressions were found to take longer to read than their literal equivalents (Gibbs 1990). Familiar metaphors were found to be processed initially both literally and metaphorically, regardless of contextual information (Williams 1992).¹ They were further shown to retain their contextually incompatible, literal meaning in contexts biasing their interpretation toward the metaphoric

meaning (Giora & Fein 1999b; Williams 1992). More recently, ironic utterances were found to take longer to read when embedded in ironically than in literally biasing context (Dews & Winner 1997, 1999; Giora, Fein & Schwartz 1998; Schwoebel, Dews, Winner & Srinivas, 2000), and to be interpreted only literally initially (Giora et al. 1998; Giora & Fein 1999a). (For a reinterpretation of Gibbs's (1986) findings suggesting that ironies are interpreted literally rather than ironically first see Giora 1995). In contrast, conventional language was processed faster than less conventional language. For instance, idioms were found to take longer to read in literally than in idiomatically biasing contexts (Gibbs 1980), and faster than their variant versions (McGlone, Glucksberg & Cacciari 1994). Conventional ironies took equally long to respond to in ironically and literally biased contexts. Similarly, they were processed initially both literally and figuratively (Giora & Fein 1999a). In Pexman, Ferretti and Katz (2000), novel metaphors took longer to read than familiar metaphors, and in Turner and Katz (1997) familiar proverb were faster to read than less familiar ones.

Which processing model then can best account for this array of inconsistent findings? Recently Giora (1997, in press) proposed that comprehension of figurative and literal language be viewed as governed by a general principle of salience, according to which salient meanings should always be accessed upon encounter. A meaning of a word or an expression is salient if it is coded in the mental lexicon. Salience, however, is a graded notion. Factors affecting degree of salience are conventionality, frequency, familiarity, and prototypicality. Thus, the institutional meaning of *bank* would be salient, that is, foremost on our mind, if we interact with commercial banks more often than with riverbanks. It would be less salient if the reverse holds. Conversational implicatures constructed on the fly, however, would be nonsalient, because they are not coded in the mental lexicon. The graded salience hypothesis thus predicts parallel access for similarly salient meanings (the figurative and literal meanings of conventional metaphors), sequential processes when salience imbalance is involved (e.g., novel metaphors whose literal but not figurative meaning is salient).

Prior context may affect comprehension immediately. It may be predictive and avail the compatible meaning very early on. However, it is not sensitive to linguistic information and does not interact with lexical accessing. Consequently, it is not effective in blocking salient but contextually incompatible meanings (see also Peleg et al. 2001). As a result, salient but contextually

incompatible meanings that have been involved initially would be suppressed postlexically if they interfere with comprehension. They would not, if they are conducive to the compatible interpretation ('The retention hypothesis, Giora, in press; Giora & Fein 1999b).

According to the graded salience hypothesis, then, when the most salient meaning is compatible (for instance, the figurative meaning of conventional idioms), it would be accessed directly (as shown by e.g. Gibbs 1980; Van der Voort & Vonk 1995) and integrate with contextual information. However, when a less rather than a more salient meaning is invited by context (e.g., the figurative meaning of novel metaphors, the literal meaning of conventional idioms, or a novel interpretation of a highly conventional literal expression), contextual information would not inhibit the salient meaning. Rather, that meaning would be accessed upon encounter regardless of context, and would be suppressed and replaced by the appropriate meaning, or retained for further processing, depending on the role it plays in comprehension (Giora in press; Giora & Fein 1999b). This holds even when context is strong and highly predictive (Gerrig 1989; Gibbs 1980; Giora et al. 1998; Peleg et al. 2001; Turner & Katz 1997). The graded salience hypothesis, thus, differs from the modular view in that it is salience sensitive and does not posit automatic suppression of contextually incompatible meanings (as assumed by Gernsbacher, Keysar & Robertson in press; Grice 1975; Swinney 1979).

In sum, the direct access view pairs with the plausible assumption that authors know what's on their mind and predicts that speakers and authors would access appropriate meaning selectively. In contrast, the modular view and the graded salience hypothesis predict that lexical access in production may resist context effects. Diverging from the modular view, the graded salience hypothesis further predicts that contextually incompatible meanings would be retained if they do not obstruct the comprehension process.

2. Lexical access in production — the case of metaphoric language

As a working hypothesis, we assume here that the processes involved in text production mirror, at least partially, those involved in text generation. Given that speakers have access to both their internal and overt linguistic products, functioning both as producers and comprehenders of their own text (Levitt 1989), the factors found to be crucial for text comprehension are assumed here to govern text production as well.

2.1 Predictions

On this assumption, the (received) direct access view regarding understanding figurative language would predict that generating metaphors should not involve activating their incompatible literal interpretation, provided the context is strong and supportive of a metaphoric interpretation. This claim has been weakened recently only with regard to novel and less familiar metaphors, suggesting that their interpretation may involve some recourse to underlying conceptual metaphors (Keysar, Shen, Glucksberg & Horton 2000, Shen & Balaban 1999),² and hence to the literal meaning as well. For example, comprehension of the novel metaphor *The microbe of a unity government* (see Appendix) may involve accessing the conceptual metaphor POLITICS IS A DISEASE. Such view thus implies that processing novel metaphor involves activation of some aspects of its literal meaning ('disease').

According to the modular view, contextually inappropriate meanings that have been activated upon production should be suppressed after a short delay (of 300–500 msec). In processing figurative language this means that the literal meaning of nonliteral utterances which has been activated initially (about 0–300 msec) should be disposed of after it has been utilized.

In contrast, the graded salience hypothesis predicts that the literal meaning of familiar as well as less of unfamiliar metaphors would be activated upon text production, because its components are salient and would be accessed automatically. It further predicts that it would be retained, because it supports the metaphoric interpretation (cf. the retention hypothesis above. For a different view, see Gernsbacher et al., in press).

To reject the direct access view, it is sufficient to show that either (a) familiar and less or unfamiliar metaphors involve their contextually inappropriate literal meaning more or less indistinguishably; or alternatively (b) that conventional metaphors involve their figurative and contextually incompatible literal meaning indistinguishably. While such findings contest the direct access view, they are also inconsistent with the modular view, which predicts immediate suppression of such incompatible meanings. They are, however, accountable by the retention hypothesis supplementing the graded salience hypothesis. Absence of traces of the literal meaning, however, will not contest the graded salience hypothesis (since speakers do not have to use available information), though they will be more consistent with the direct access and modular views.

Given that online measures of text production are hardly available, one way to test these predictions is to study the ecology of metaphors in naturally occurring discourses. Mention of a meaning of a metaphor in the metaphor's immediate neighborhood, i.e., in the metaphor's clause or in the next two or three clauses, may count as evidence that that meaning was active in the producer's mind and was, therefore, made manifest. Rather than discarded as incompatible, that meaning was retained for further processes. Note that the various approaches in question (with the exception of the modular view) differ only insofar as *unintended* (i.e., literal) meanings of *familiar* metaphors are concerned. Thus, if familiar and less familiar metaphors both prime and retain their unintended literal meaning indistinguishably, this would support the graded salience hypothesis, but challenge both the modular and direct access views, the former on the basis of the suppression hypothesis and the latter on its selectiveness hypothesis. Given that in a metaphor-inviting context, familiar metaphors are expected to be processed only metaphorically, findings indicating that familiar metaphors were processed literally would be problematic for the direct access view: They will attest that these meanings have been accessed regardless of context. However, if only less familiar metaphors activate and retain their unintended literal meanings, this would be consistent with the weaker version of the direct access view proposed by Keysar et al. (2000) and only partly consistent with the graded salience hypothesis and modular view.

To test these hypotheses we collected naturally occurring metaphors that were either elaborated on following their mention, or were not. We then looked into (a) whether the set of metaphors elaborated on differed in terms of familiarity/novelty from the set which received no elaboration. We further looked into (b) whether metaphors judged as highly familiar exhibit no elaboration, as would be predicted by the various versions of direct access view. Findings to the contrary would favor the graded salience hypothesis.

2.2 Method

Materials

Our materials were metaphors appearing in newspaper articles. We randomly collected 60 metaphors from the columns' section of Ha'aretz — an Israeli daily — during the months of August and September 1997. Thirty involved some mention or echo of their (unintended) literal interpretation, i.e., a word or an expression semantically related to their literal meaning, in the same or next clause(s) (e.g., 1a, 1b), and 30 did not (e.g., 2a, 2b, see also Appendix).

- (1) a. The strikes in the Education system took place when the Union was putting up a *fight* against the government. In this fight, threats, sanctions and even a general strike were the *weapons*. (Ha'aretz, 4.9.97: B1)
- b. In this situation, the Treasury looks like *an island* of sanity in a *sea* of unconstrained demands. (Ha'aretz, 12.9.97: B1)
- (2) a. He lost his health, and his spirit *broke*. (Ha'aretz, 1.9.97: B1)
- b. Every honest and benevolent person should have *given a shoulder* to the minister of Treasury so that he can succeed in implementing his plan. (Ha'aretz, 4.9.97: B1)

Participants

Forty native speakers of Hebrew (30 females, 10 males) participated in the experiment. They were all undergraduates in the department of Poetics and Comparative Literature, Tel Aviv University, aged 21–40. They participated in the experiment voluntarily.

Procedure

The participants were presented with the 60 metaphors and another five, contrived, novel metaphors. They were asked to rate them on a 1–7 familiarity scale: from the least unfamiliar (1) to the most (7) familiar metaphor.

2.3 Results

The mean familiarity rate of each metaphor (ranging from 2–6.95) was the basic datum for the analysis. Findings showed that, as predicted by the graded salience hypothesis, but contra the direct access approach (see (a) above), metaphors followed by a mention of their literal meaning did not differ familiarity-wise from those that were not, the difference between the means was insignificant ($t=0.96$, $p=0.34$, two tail). That is, the metaphors whose literal meaning was retained — echoed and elaborated on — in the immediate or next clause(s) (e.g., (1a-b) above) were not evaluated as more or less familiar than those that received no literal extension (e.g., (2a-b) above).

Moreover, a check of the number of metaphors which received the highest familiarity rates (6–7) reveals that 15 of them belonged in the group of (30) metaphors which had literal extensions (e.g., (1a-b) above) and 17 belonged in the other group of (30) metaphors whose literal meaning was not elaborated on (e.g., (2a-b) above). Thus, as predicted by (b) above, and in accordance with

the graded salient hypothesis, but contra the direct access and standard pragmatic models, highly familiar metaphors retained both their compatible and contextually incompatible (literal) meaning indistinguishably, suggesting that even highly conventional metaphors involve processing their salient though contextually incompatible meaning.

3. Discussion and conclusions

Since we did not use an on-line measure, our findings cannot directly support an autonomous view of lexical access in production. However, they are certainly consistent with it, suggesting that context does not block activation of contextually incompatible but salient (i.e., coded) meanings. Even highly familiar metaphors, whose metaphoric meaning may be processed directly, avail their salient, literal meaning upon their production alongside the metaphoric meaning, though this meaning may be incompatible with contextual information. These findings are consistent with the graded salience hypothesis, which is (only) partially congruent with a modular view of lexical access in production.³ They suggest that the processes involved in text production are similar to those involved in text comprehension. Activation of salient meanings is automatic, and does not interact with the context at an early stage: Context does not pre-select only the appropriate meaning; that is, it does not inhibit activation of salient incompatible meanings (cf. section 1, and see also Honeck 1997, p. 46–7), though it can of course predict it.

Illustrative is the following example (cited in Honeck 1997, p. 47), where the salient meaning of *leaf* (a part of a plant) is activated in the idiom ‘turn over a new leaf’ even though this is not the meaning of *leaf* (page) on which the idiom is based. This ‘error’, we propose, attests to the involvement of salient (though incompatible) meanings in text production, as opposed to less salient (though more compatible) meanings (such as the ‘page’ meaning of *leaf*):

- (3) Fred is cutting his *lawn* earlier now. I guess he’s turning over a new *leaf*.

Our findings corroborate findings by Nayak and Gibbs (1990) quoted in Gibbs (1994, p. 301), which show that readers are sensitive to the salient, contextually incompatible meanings of figurative language when they are asked to rate the appropriateness of an incoming text-segment (and act as text producers, to a certain extent). For example, when asked to rate the appropriateness of idioms

for a particular paragraph ending, subjects tended to select as more appropriate the idiom stemming from the source domain enhanced by the paragraph. Thus, out of (4a) or (4b) in the context of (4), they selected (4a) whose (incompatible) literal meaning ‘coheres’ or ‘resonates’ with the salient literal meanings of the chain of metaphors instantiated in (4):

- (4) Mary was very tense about this evening’s dinner party. The fact that Bob had not come home to help was making her fume. She was getting hotter with every passing minute. Dinner would not be ready before the guests arrived. As it got closer to five o’clock the pressure was really building up. Mary’s tolerance was reaching its limits. When Bob strolled in at ten minutes to five whistling and smiling, Mary
 (a) blew her top
 (b) bit his head off

These findings show that text progression is not only sensitive to the figurative meanings accessed by the text’s comprehender/producer (which should have resulted in no appropriateness difference between the two possible idiomatic continuations), but that it is even more sensitive to salient though incompatible meanings. Though this experiment is only partially relevant to our research, involving comprehension and text appreciation rather than text production, its findings are suggestive of the same processes alluded to here.

Our findings can also be viewed as an instantiation of a more general phenomenon of “dialogic syntax” (Du Bois 1998, 2000a,b and see also Coates 1966; Levelt 1989). Dialogic syntax occurs when a speaker constructs an utterance based on an immediately co-present utterance. Du Bois discloses the ubiquity of “dialogic syntax”, showing that a vast array of linguistic elements such as syntactic, semantic, pragmatic, lexical, and even phonetic patterns in one speaker’s discourse can be traced back to an immediately co-present utterance. This suggests that activation of any linguistic element makes it available for the same or next speaker to elaborate on. Activation of that element enhances it, which, in turn, suppresses other possible alternatives. Enhancement makes it accessible and, hence, a preferable candidate to be selected and elaborated on in the next utterance (Gernsbacher 1990). Our findings show that metaphors, not least familiar metaphors, are processed (also) literally in the mind of the discourse producer, thereby allowing reoccurrence of the salient/literal meaning in the next discourse segment. Evidence of similar effects of a given utterance on adjacent ones (cf. Du Bois 1998,

2000b) suggests that salience of meanings (and constructions), which is subject to local manipulation (enhancement/suppression) in discourse through dialogic resonance, is a major factor in discourse production.

Appendix

Translated sample items, all taken from Ha'aretz, August-September 1997, B1:

I. Metaphors with an extension of their literal meaning (in the Hebrew original):

- (1) Of all the *viruses* and *microbes* which call upon our country, the worst is the *microbe* of a unity government. This *plague*, which usually breaks out abruptly...
- (2) This is a *story* that has begun but has not yet *ended*. One important *scene* ended when Yitzhak Rabin was assassinated [...]. The second *scene* ended when Peres was Prime Minister...
- (3) The Palestinian affair is a *time bomb* that has to be *dismantled*/(disassembled) before it *explodes*.
- (4) Israel needs ... not only those who *flirt* with the capital market, but those who *marry* it, for better or worse, in poverty and in wealth, until "a purchase proposal" do they part.
- (5) Politically the present Croatian leaders' wishing to *blur the impression* of the "Ostasha" rehabilitation is understandable. But they will find it difficult to *erase the moral stain* of their attempt to rehabilitate the murderers and their accomplices.
- (6) (Addressed to Albright): If you *sink*/(dive) into [meaning preoccupy yourself with] Dahania, or into the port, or into the security arrangements and into the days on which a bulldozer will pass or will not pass, you will *drown in a sea of details*.
- (7) All this happened when the civil servants were *drowsy* while on duty. If they were *alert*/(wide awake), the deterioration [...] might have been prevented.

II. Metaphors with no extension of their literal meaning:

- (1) In her position as the mother of the future king, [Diana] was *stuck as a bone in the throat* of the British monarchy. And from this position and being so bright, she opened a window into the inhumanity of the royal family.
- (2) Ninety percent of the property in Israel has now been turned into state property [...] regardless of whether the laws *passed the elementary test* of justice and equality.
- (3) They don't talk of *small fish*, they talk of terrorists with blood on their hands.
- (4) Soon the patients *rolled up their sleeves* and their lawyers entered the battlefield.

Notes

* This research was supported by a grant from The Israel Science Foundation. We have also benefited from discussions with Mira Ariel, Jack Du Bois and Ray Gibbs. Thanks are also extended to Sharon Himmelfarb and two anonymous reviewers for their comments.

1. Williams (1992) actually studies polysemous words but most of them were metaphorically based.
2. Inconsistently with the direct access view, the consensus is that comprehension of novel metaphors differs from comprehension of familiar metaphors and should involve activating their contextually incompatible salient meaning, i.e., their literal meaning (e.g., Keysar et al. 2000, and see Gibbs 1994 for a review).
3. The modular view of lexical access in speech production distinguishes between meaning-related and form-related processes (see, e.g., Levelt 1993; Dell & O'Seaghdha 1992). However, this view is only marginally relevant to our discussion here.

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