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## *S/he is not the Most Sparkling Drink in the Pub* Global Vs. Local Cue – Which Reigns Supreme?

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### ABSTRACT

Within the framework of the Defaultness Hypothesis, *automatic* responses to “fully abstract phrasal patterns,” involving strong attenuation of highly positive concepts, are sarcastic. Such global constructional responses will be derived *by default* once their stimuli are free of factors known to affect processing of nonliteralness. They should, therefore, be (a) novel; (b), free of local cues such as semantic anomaly or internal incongruity; and (c) free of contextual support. Here we weigh global non-metaphorical constructions, meeting conditions (a-c) for defaultness (*S/he is not the most fascinating speaker around*) against novel, nondefault metaphorical counterparts, not meeting these conditions (*S/he is not the most sparkling drink in the pub*). The metaphorical constructions, involving a local, semantically anomalous cue, further deautomatize conventionalized counterparts (*S/he is not the sharpest pencil in the box*), which renders them optimally innovative. Given that the metaphorical constructions involve local semantic anomaly, this precludes them from being derived *by default* (see (b) above). Despite this difference between the two kinds of (metaphorical and non-metaphorical) stimuli, they all share the same global construction, involving strong attenuation of highly positive concepts. Results of four offline, corpus-based experiments, and three corpus-based studies show that both these (metaphorical and non-metaphorical) constructions are interpreted sarcastically. As such, they further affect text production which often unfolds via mirroring default rather than nondefault responses. Still, the innovative metaphorical uses an increased degree of sarcasm, rendering these stimuli more pleasing. Although the global constructional responses reign supreme, the optimally innovative metaphoricalness contributes to both, the sarcastic nature of the responses and their hedonic effects.

### Introduction: the Defaultness Hypothesis

#### *Global constructional vs. local semantically anomalous cues: which will dominate interpretations' end-product?*

This study aims to provide corroborative, corpus-based evidence to online findings following from the Defaultness Hypothesis (Giora, Givoni, & Fein, 2015c). According to the Defaultness Hypothesis, responses (such as “S/he is dull”) to stimuli, involving global constructional cues, strongly attenuating highly positive concepts (by means of negation,<sup>1</sup> as in *S/he is not the most fascinating speaker around*), will spring to mind unconditionally, initially and directly, faster than non-attenuated counterparts (*S/he is the most fascinating speaker around*). In Filik, Howman, Ralph-Nearman, and Giora (2018) and Giora et al. (2015c), this speed superiority of the constructional stimuli, was unaffected by other factors known to affect processing, such as equal degree of novelty (Giora, 1997,

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<sup>1</sup>On negation and rhetorical questions as attenuators, see Giora et al. (2015c); Giora et al. (2018b).

2003), equal degree of non/literalness (Grice, 1975), or equal strength of contextual support (Gibbs, 1994).

Within the framework of the Defaultness Hypothesis, automatic responses to such “fully abstract phrasal patterns” (Goldberg, 2003, p. 219; 2006), will be considered as default, once their stimuli meet the conditions for defaultness. These conditions (see a–c below) guarantee that *potential ambiguity* between literal and nonliteral interpretations is allowed a priori, so that a preference is allowed.

For a preference to be allowed a priori, stimuli should be

(a) unfamiliar, noncoded (as stimuli’s familiarity-speed negatively affects the accessibility of alternative options; see e.g., Giora, 2003);

(b) free of internal cues, such as semantic anomaly or internal incongruity (as they prompt nonliteralness; see e.g., Beardsley, 1958; Partington, 2011); and

(c) free of external cues, such as specific contextual information, intonation, or discourse markers, such as *pun intended*, *literally*, *to put it mildly*, or *#sarcasm* (as they bias non/literalness; see e.g., Becker & Giora, 2018; Givoni, Giora, & Bergerbest, 2013; Kovaz, Kreuz, & Riordan, 2013; Sulis, Hernandez Farias, Rosso, Patti, & Ruffo, 2016, among others).

Unconditional, automatic interpretations, meeting these conditions, are default responses. Indeed, some of the constructions tested here (*S/he is not the most fascinating speaker around*), strongly attenuating, by means of negation, highly positive concepts (*the most fascinating*), convey sarcastic interpretations *by default*. This was shown by Giora et al. (2015c), who first tested such negative items when in isolation, asking participants to indicate the preferred interpretation of each item. Having established their sarcastic interpretation as the favored response, Giora et al. (2015c) further measured these items’ processing speed when in equally strong contexts, supportive of their respective (sarcastic, literal) outputs. Results attested to the speed superiority of the default preferred sarcastic interpretations over their nondefault non-preferred literal counterparts. These results were further replicated (in English) by Filik et al. (2018), who applied the eye-tracking technique during reading, and by Giora, Cholev, Fein, and Peleg (2018a), who applied the divided visual field paradigm during a lexical decision task (in Hebrew).

Other similar constructions, even if strongly attenuating highly positive concepts, (e.g., *S/he is **not the most sparkling drink in the pub***), although sarcastic, are not definable as such *by default*, even while generated automatically. Given that they are multi-layered, involving a metaphorical response, prompted by a semantically anomalous cue (whereby a person is/is not a *sparkling drink*), they *do not* meet condition (b) above for defaultness. Similar constructions, although few, are semantically coded (*S/he is not the sharpest pencil in the box*; *S/he is not the sharpest tool in the shed*); hence they involve default, salient *meanings*.<sup>2</sup> Others are noncoded and unique (*S/he is not the most sparkling drink in the pub*; *S/he is not the brightest marker in the box*), involving nondefault responses, as they *do not* meet the above (b) and often (c) conditions for defaultness (see example 1 below). Still, given their constructional nature – strongly attenuating highly positive concepts – they are expected to convey sarcastic interpretations automatically (“s/he is very stupid/dull,”) above and beyond their anomalous i.e., metaphorical layer, irrespective of the degree of novelty.

In 4 offline corpus-based experiments and 3 corpus-based studies, we test here the predicted superiority of constructionally oriented interpretations. Specifically, we set out to (re)solve the enigma as to whether such constructions, strongly attenuating highly positive concepts, indeed affect *sarcasm* interpretation automatically, regardless of the involvement of semantic anomaly, which should allow the metaphorical interpretation to gain the upper hand (see Beardsley, 1958). Indeed, according to the Defaultness Hypothesis, given the superiority of sarcastic interpretations as a function of strong attenuation of highly positive concepts, this constructional constraint is

<sup>2</sup>*Meanings*, which are coded, can also be default responses; however, our studies here focus on noncoded *interpretations*, constructed on the fly.

expected to allow sarcasm to win over (see Filik et al., 2018; Giora et al., 2018a, 2015c; Giora, Jaffe, Becker, & Fein, 2018b).

Still, while superseding the effect of metaphorically involved interpretations, the latter might also contribute their share. Indeed, like the coded stimuli (*S/he is not the sharpest pencil in the box; S/he is not the sharpest tool in the shed*), their deautomatized version (*S/he is not the most sparkling drink in the pub; S/he is not the brightest marker in the box*) will also have the same interpretation, conveying a sarcastic opposite (e.g., “stupid;” “dull”).<sup>3</sup> This will be shown here by means of (i) corpus-based studies, looking into degree of sarcasm and contextual resonance (à la Du Bois, 2014) with utterances’ automatic interpretations (whether default or quasi-default), both metaphorical and non-metaphorical, and by (ii) off-line corpus-based experiments testing their degree of sarcasm and hedonic effects (Ball, Threadgold, Marsh, & Christensen, 2018).

### **Global constructional vs. local semantically anomalous cues: which will dominate text production?**

In Giora, Givoni, & Becker, *Submitted*, we test the prediction, following from the Defaultness Hypothesis, that items, strongly attenuating highly positive concepts, shown earlier to be interpreted sarcastically by default when in isolation (Giora et al., 2018a, 2015c, 2018b), will affect text production via reflecting that interpretation. Specifically, when in natural discourse, their neighboring utterances will echo their default (sarcastic) interpretation, thus allowing text production to evolve via resonating with default, automatic responses. (On resonance, see examples 1–3 below; see also Du Bois, 2014; Giora et al., 2013: Study 2; Giora, Drucker, & Fein, 2014a; Giora, Raphaely, Fein, & Livnat, 2014b).

Here, we aim to find out which factors dominate interpretation preferences. Is it the global constructional cue per se, inviting sarcasm interpretation automatically, or is it its semantics, involving the local, semantically anomalous metaphorical cue that does the trick? Which of the two, the local (anomalous) or the global (constructional) cues, will affect interpretation preferences to a greater extent, thereby further dominating text production?

To test the effect of these cues on text interpretation and production, we examine here (a) non-metaphorical (such as *S/he not the most fascinating speaker around*), (b) metaphorical, multi-layered coded constructions, involving strong attenuation of highly positive concepts (such as *S/he is not the sharpest pencil in the box*), and (c) non-coded variants (such as *S/he is not the most sparkling drink in the pub*).

### **Predictions**

Based on the prediction that strongly attenuating highly positive concepts affects sarcasm interpretations automatically, and often, by default (once abiding by conditions a-c above), we expect such constructions, even when involving semantically anomalous (metaphorical) layers,

- (a) to be rated as sarcastic when in isolation (see Experiments 1–3); and when in context,
- (b) to be rated as sarcastic, regardless of the degree of metaphoricalness (see Study 1), and
- (c) to be further echoed by their environment (if echoic) via their default sarcastic interpretation (see Study 2),
- (d) rather than their nondefault noncoded metaphorical interpretation (see Study 3); and when deautomatizing coded conventionalized counterparts (e.g., *S/he is not the sharpest pencil in the box*),

<sup>3</sup>On the poetics of deautomatization of conventionalized patterns, see Miall and Kuiken (1994); Renan (1984); for a similar view, see Berlyne (1960); Schopenhauer, 1997; Townsend (1997); and see also Giora et al. (2004).

- (e) to be rendered Optimally Innovative (e.g., *S/he is not the most sparkling drink in the pub*) and therefore to be rated as more pleasing than their default noncoded, non-metaphorical, non-deautomatized, yet sarcastic counterparts, (e.g., *S/he is not the most fascinating speaker around*; see Experiment 4).

To exemplify possible options of resonance (see prediction (c) above), consider the following naturally occurring examples (1–3 below). In example (1), speaker (A) uses a negative construction, conveying a sarcastic message (meaning “stupid”), which is further mitigated by *to put it mildly* – a cue used to attenuate harsh, e.g., sarcastic messages (see, Becker & Giora, 2018). Speaker (B) addresses that “dumbness” of the MK<sup>4</sup> (by labeling him *nobody*), thus resonating with that default sarcastic response. In example (2), alongside resonating with the default sarcastic “stupid” sense (of “failing to perceive a point”), comparing “the sharpest pencil” to the “sharpest surgical knife,” constitutes resonance with the physical, literal attribute of “sharp.” In example (3), alongside resonating with the sarcastic meaning (“he’s downright slow”), “using metaphor” while “calling that person a crayon”, further resonates with the metaphorical sense of the idiom:

- (1) A: Dear MK Amsalem, you don’t stop proving that you are not the sharpest pencil in the box (*to put it mildly*).<sup>5</sup>  
B: Even if they double his brain *he will still be nothing/nobody*.
- (2) If someone ... is *failing to perceive a point*, they say: “He is not the sharpest pencil in the box.” In the operating room too, it would be best if you use the *sharpest surgical knife* in order to be precise and succeed.<sup>6</sup>
- (3) So when we say someone is not the sharpest crayon in the box. we’re [sic] using metaphor by *calling that person a crayon*, and we’re using litotes by putting it that way when we really mean *he’s downright slow!*<sup>7</sup>

Using *HeTenTen* (a Hebrew web-corpus,<sup>8</sup> comprising about  $10^9 \times 1$  tokens) as our data source for both, the corpus studies and the experiments, reveals that, as predicted,

- the **default** interpretation of these negative constructions, established as such when in isolation, is sarcastic, regardless of the degree of metaphoricalness (see Experiments 1–3 below); when in context,
- such constructions are also rated as sarcastic, regardless of degree of metaphoricalness (see Study 1 below); in addition,
- their contextual environment resonates with their default sarcastic interpretation (see Study 2 below)
- rather than their nondefault literal and/or metaphorical interpretations (see Study 3 below). And when rendered Optimally Innovative, (*S/he is not the most sparkling drink in the pub*), deautomatizing default counterparts (*S/he is not the sharpest pencil in the box*),
- this nondefault metaphorically layered construction, is rated as more pleasing than its default non-deautomatized counterparts (*S/he is not the most fascinating person around*; see Experiment 4 below).

<sup>4</sup>Member of Knesset (the Israeli parliament).

<sup>5</sup><https://www.ynet.co.il/Ext/App/TalkBack/CdaViewOpenTalkBack/0,11382,L-4988856,00.html>(in Hebrew).

<sup>6</sup><https://blog.ravmilim.co.il/tag/%D7%97%D7%93/>(in Hebrew).

<sup>7</sup><https://answers.yahoo.com/question/index?qid=20081111190610AAkg7o1&guccounter=1>.

<sup>8</sup>For a detailed description of HeTenTen, see Becker and Giora (2018); for access to HeTenTen and description of the entire family of TenTen corpora, see <http://www.sketchengine.co.uk>.

## Corpus-based evidence – experiments and studies

In Experiments 1–3, we first aim to establish the degree of defaultness of constructions when presented in isolation.<sup>9</sup> Based on Giora et al.'s (2015c) and Giora et al.'s (2018b) predictions and findings, we expect constructions, involving strong attenuation of highly positive concepts, to be interpreted sarcastically automatically, whether *in or outside of* context, and even while involving an additional metaphorical layer. Given the automaticity of these constructional interpretations, this should be true of both, default responses of coded stimuli (such as *S/he is not the sharpest pencil in the box*) as well as nondefault non-coded counterparts (such as *S/he is not the brightest marker in the box*), the latter deautomatizing the coded construction(s). Furthermore, both metaphorical (*S/he is not the brightest marker in the box*) and non-metaphorical items (*S/he not the most fascinating speaker around*) are expected to be interpreted sarcastically, whether *in or out of* context.

In Study 1, we therefore attempt to show that, when in natural discourse, such constructions are interpreted sarcastically, regardless of whether they are metaphorical (*S/he is not the brightest marker in the box*) or not (as in *S/he not the most fascinating speaker around*).

In Study 2, we test the prediction that such sarcastic constructions, whether metaphorical or not, will be echoed by their contextual environment via their sarcastic interpretation. This will suggest that text production evolves via resonating with *default* (here constructional, sarcastic) interpretations.

In Study 3, we test the prediction that, such sarcastic yet nondefault metaphorical constructions (*S/he is not the brightest marker in the box*), while echoed by their contextual environment via their *default* constructional (i.e., sarcastic) interpretation, will be rarely echoed by that environment via their *nondefault* noncoded metaphorical interpretation. This will replicate previous findings, showing that text production evolves via resonating with *default* rather than *nondefault* interpretations (e.g., Giora, Submitted; Giora et al., 2014a, Submitted). (Note that, whereas in previous studies, e.g., Giora et al., 2015c, the nondefault noncoded interpretation of the negative constructions was literal, here, it is metaphorical).

Being metaphorically innovative, these items will, therefore, allow us to further test their degree of pleasantness compared to their non-metaphorical counterparts. In Experiment 4, we, therefore, test such items' pleasurability. Participants rate the degree of pleasure/humor of both metaphorical and non-metaphorical items when presented in isolation. According to the Optimal Innovation Hypothesis, constructional defaultness (*She is not the sharpest pencil in the box*), when deautomatized and rendered nondefault, yet Optimally Innovative (*She is not the most sparkling drink in the pub*), will be more pleasing/humorous than non-deautomatized counterparts (*He is not the most talented kid in the kindergarten*), even though both will be interpreted sarcastically automatically, the latter, though, by default. (On Optimal Innovativeness, see Giora, Fein, Kotler, & Shuval, 2015b; Giora et al., 2004; Giora, Givoni, Heruti, & Fein, 2017).

### Experiment 1: establishing a degree of sarcasm of non-metaphorical constructions

Experiment 1 tests prediction (a) above, expecting strongly attenuating highly positive concepts of non-metaphorical constructions to be interpreted sarcastically when in isolation.

#### Method

##### Participants

One participant (4%) was excluded from the analysis, for rating *all* filler items as highly sarcastic, thus failing to distinguish between sarcastic and nonsarcastic alternatives. Participants, then, included 24 volunteers, all native speakers of Hebrew (13 women and 11 men), aged 22–37 ( $M = 28.83$ ,  $SD = 4.42$ ), who were recruited over the web and paid the equivalent of \$4 for their

<sup>9</sup>All our experimental items and those used in our studies are corpus-based Hebrew stimuli.

participation. Education ranged from 12 to 23 years altogether. Those who indicated their field of expertise graduated from the faculties of Exact Sciences and Engineering, Social Sciences, Humanities (other than linguistics), and Life Sciences (including Medicine).

### **Stimuli**

Stimuli were 49 items, including 15 experimental constructions, strongly attenuating highly positive concepts, 30 non-constructional filler items, extracted from a daily newspaper, and four buffers. The 15 experimental items were non-metaphorical (e.g., *S/he is not the most talented kid in the kindergarten*).<sup>10</sup> All the items, including the set of the four buffers, were pseudo-randomly ordered, so that each participant was presented a list uniquely arranged for her/him.

### **Procedure**

Participants were sent a web-link to the experiment. The first two pages of the experiment displayed the instructions, including three examples. The participants were asked to rate any item on a seven-button sarcasm scale. Each participant was presented 49 screens (including the buffer items). Each screen contained a single phrase (an experimental, a filler, or a buffer item), centered at the top of the page and followed by the seven-button sarcasm scale. The right end of the scale displayed the word *biting* (meaning “sarcastic/humorous”) and the left end of the scale displayed the words *not biting* (meaning “not sarcastic/not humorous”). The seven-button scale concealed a 7-point ordinal scale used for the data analysis. The participants were allowed unlimited time to reflect upon their ratings (before pushing a specific button).

### **Results and discussion**

Results show that the 15 non-metaphorical items were rated as sarcastic by participant ( $t_1$ ) and, marginally so, by item ( $t_2$ ) analyses. Specifically, participant analysis reveals that the mean score of the non-metaphorical stimuli ( $M = 4.52$ ,  $SD = 1.01$ ) was higher than 4 – the midpoint on the 7-point sarcasm scale. This difference, 0.52, BCa 95% CI [0.10, 0.95], is significant  $t_1(23) = 2.53$ ,  $p < .05$  and represents a medium-size effect (Cohen’s  $d = 0.52$ ). The item analysis also reveals that the mean score of the non-metaphorical stimuli was higher than 4. However, this time only marginally so,  $t_2(14) = 1.94$ ,  $p = .073$  (see [Figure 1](#) below).

## **Experiment 2: establishing a degree of sarcasm of metaphorical constructions**

Experiment 2 tests prediction (a) above, expecting metaphorical constructions, strongly attenuating highly positive concepts, to be interpreted sarcastically when in isolation.

### **Method**

#### **Participants**

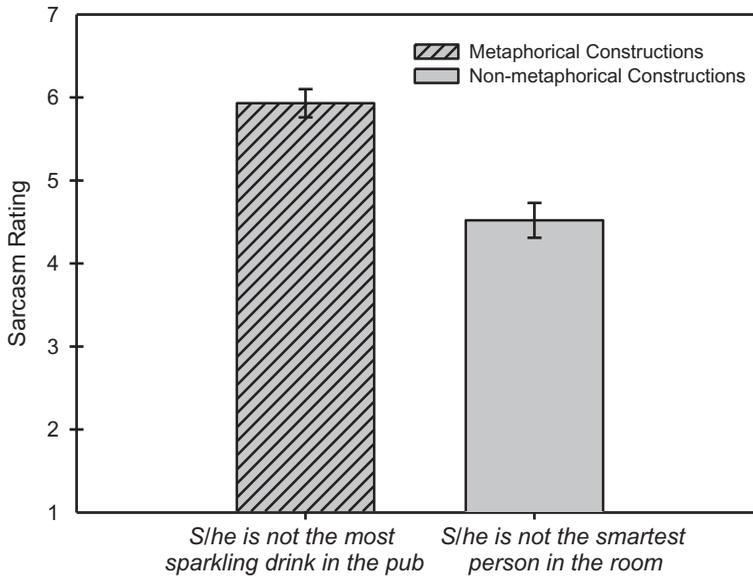
Participants were 32 volunteers, all native speakers of Hebrew (16 women and 16 men), aged 21–37 ( $M = 28.81$ ,  $SD = 4.66$ ), who were recruited over the web and paid the equivalent of \$4 for their participation. Education ranged from 12 to 30 years altogether. Those who indicated their field of expertise graduated from the faculties of Exact Sciences and Engineering, Social Sciences, Humanities (other than linguistics), and Life Sciences (including Medicine).

#### **Stimuli**

Stimuli were 49 items, including 15 metaphorical constructions, strongly attenuating highly positive concepts (e.g., *S/he is not the most sparkling drink in the pub*),<sup>9</sup> 30 non-constructional filler items,

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<sup>10</sup>For such constructions, see [Appendix A](#).



**Figure 1.** Degree of sarcasm of non-metaphorical (Experiment 1) and metaphorical (Experiment 2) constructions.

extracted from a daily newspaper, and four buffer items. All the items, including the set of the four buffers, were pseudo-randomly ordered, so that each participant was presented a list uniquely arranged for her/him.

### Procedure

As in Experiment 1.

### Results and discussion

Results show that the 15 metaphorical items were rated as sarcastic by both participant ( $t_1$ ) and item ( $t_2$ ) analyses. Specifically, participant analysis reveals that the mean score of the metaphorical stimuli ( $M = 5.93$ ,  $SD = 0.98$ ) was higher than 4 – the midpoint on the sarcasm scale. This difference, 1.93, BCa 95% CI [1.57, 2.28], is significant  $t_1(31) = 11.14$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 1.97$ ). Similarly, the item analysis further reveals that the mean score of the metaphorical stimuli was higher than 4. This difference, 1.93, BCa 95% CI [1.64, 2.22], is also significant  $t_2(14) = 14.34$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 3.69$ ) (see Figure 1 above).

### Experiment 3: establishing a degree of sarcasm of metaphorical and non-metaphorical constructions when weighed directly against each other

The aim of Experiment 3 was to establish the degree of defaultness (i.e., sarcasm) of constructions, strongly attenuating highly positive concepts, whether with or without an additional metaphorical layer. As per prediction (a) above, we expected these constructions to affect sarcasm interpretation automatically, regardless of their degree of metaphoricalness, and even when weighed directly against each other. To that end, we tested such constructions when in isolation.

## Method

### Participants

Participants were 25 volunteers, all native speakers of Hebrew (17 women and 8 men), aged 22–71 ( $M = 32.82$ ,  $SD = 11.92$ ), who were recruited over the web. Education ranged from 12 to 22 years altogether. Those who indicated their field of expertise graduated from the faculties of Exact Sciences and Engineering, Humanities (both linguists and non-linguists), Social Sciences, and Life Sciences.

### Stimuli

Stimuli were 64 Hebrew items, including 30 experimental constructions, strongly attenuating highly positive concepts, 30 non-constructional filler items, extracted from a daily newspaper, and four buffer items. The 30 experimental items were divided between 15 metaphorical items (e.g., *S/he is not the most sparkling drink in the pub*) and 15 non-metaphorical counterparts (e.g., *S/he is not the most talented kid in the kindergarten*).<sup>9</sup> As before, all the items, including the set of the four buffers, were pseudo-randomly ordered, so that each participant was presented a list uniquely arranged for her/him.

### Procedure

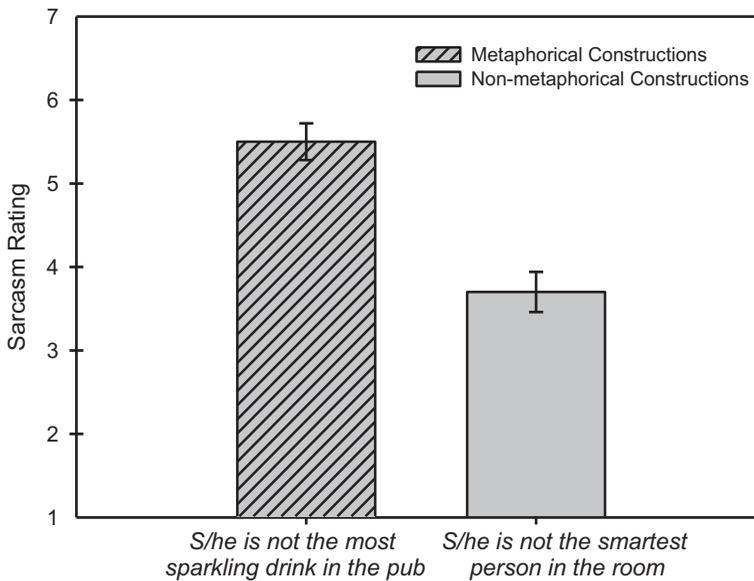
As in Experiment 1.

## Results and discussion

Results are illustrated in Figure 2 below. They show that, as predicted, the tendency to interpret such constructions as sarcastic typifies both metaphorical and non-metaphorical items. Indeed, the 15 metaphorical items were rated as sarcastic by both participant ( $t_1$ ) and item ( $t_2$ ) analyses. Specifically, participant analysis reveals that the mean score of the metaphorical stimuli ( $M = 5.50$ ,  $SD = 1.10$ ) was higher than 4 – the midpoint on the sarcasm scale. This difference, 1.50, BCa 95% CI [1.04, 1.95], is significant  $t_1(24) = 6.81$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 1.36$ ). Similarly, the item analysis further reveals that the mean score of the metaphorical stimuli was higher than 4. This difference, 1.50, BCa 95% CI [1.15, 1.84], is also significant  $t_2(14) = 9.29$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 2.42$ ). In addition, results show that the 15 non-metaphorical items were rated as sarcastic by both participant ( $t_1$ ) and item ( $t_2$ ) analyses. Specifically, participant analysis reveals that the mean score of the non-metaphorical stimuli ( $M = 3.70$ ,  $SD = 1.18$ ) is insignificantly lower than 4 – the midpoint on the sarcasm scale,  $t_1(24) = 1.15$ ,  $p = .22$ . Similarly, the item analysis further reveals that the mean score of the non-metaphorical stimuli is also insignificantly lower than 4,  $t_2(14) = 1.23$ ,  $p = .24$ .

Still, the 15 metaphorical constructions were rated as more sarcastic than the non-metaphorical counterparts by both participant ( $t_1$ ) and item ( $t_2$ ) analyses. Specifically, participant analysis reveals that the mean sarcasm score of the metaphorical stimuli ( $M = 5.50$ ,  $SD = 1.10$ ) was higher than that of the non-metaphorical counterparts ( $M = 3.70$ ,  $SD = 1.18$ ). This difference, 1.80, BCa 95% CI [1.34, 2.41], is significant  $t_1(24) = 8.23$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 1.58$ ). Similarly, the item analysis further reveals that the mean sarcasm score of the metaphorical stimuli was higher than that of the non-metaphorical counterparts. This difference, 1.80, BCa 95% CI [1.20, 2.39], is also significant  $t_2(28) = 6.18$ ,  $p < .001$  and represents an extremely large size effect (Cohen's  $d = 2.28$ ).

In sum, when presented alongside filler items only, both metaphorical and non-metaphorical items were rated as sarcastic. Crucially, the 15 metaphorical constructions in Experiment 2 were rated as more sarcastic than the 15 non-metaphorical constructions in Experiment 1, as illustrated by Figure 1 above. These results were replicated by those of Experiment 3, as illustrated by Figure 2 above, in which, unlike in Experiments 1–2, the metaphorical and the non-metaphorical constructions were weighed directly against each other and rated as sarcastic by the same participants.



**Figure 2.** Degree of sarcasm of metaphorical and non-metaphorical constructions.

Overall, then, the metaphoricalness of the metaphorical stimuli seems to contribute to and increase items' sarcastic interpretation when weighed (directly or indirectly) against non-metaphorical counterparts. Such results are unprecedented. They attest to the amplification of items' degree of sarcasm as a consequence of their metaphoricalness. The interaction between these two kinds of figurativeness intensifies the superiority of the dominant (here, sarcastic) interpretation.

Will this difference further affect the expected contextual resonance with default sarcastic outputs when metaphorical and non-metaphorical items are studied (see Study 2)? To find out about that, Study 1 was designed to first detect the items' degree of non/literalness.

### Study 1: rating degree of non/literalness

In Study 1, we test prediction (b) (see the Predictions Section above), expecting metaphorical and non-metaphorical constructions to be interpreted sarcastically when in context. Here we, therefore, ran a rating study of the degree of nonliteralness of metaphorical and non-metaphorical constructions when embedded in their natural environment.

#### Method

##### Participants

Three judges, native speakers of Hebrew, experts in figurative language,<sup>11</sup> participated in this study.

##### Stimuli

Stimuli, embedded in prior and late context, were all extracted from HeTenTen.

##### Procedure

The three expert judges were asked to indicate whether each of the 76 stimuli, they were presented with, was

<sup>11</sup>The judges' expertise is a result of being highly informed and educated in the field of figurativeness, while further benefitting from their investment in their research on the topic, which they have conducted when graduating.

- (a) metaphorical, not metaphorical, or unclear;
- (b) sarcastic, literal,<sup>12</sup> or unclear;

### Results and discussion

Results show that (a) all 38 metaphorical constructions were judged as metaphorical by at least two judges, and all 38 non-metaphorical constructions were judged as not metaphorical by at least two judges. They further show that (b) most of the metaphorical constructions (35/38 = 92%) were rated as sarcastic by at least two judges (binomial test,  $p < .001$ ), as were most of the non-metaphorical constructions (26/38 = 68%), which were also rated as sarcastic by at least two judges (binomial test,  $p < .05$ ).

Although most of the items in each of the lists (whether metaphorical or non-metaphorical) were rated as sarcastic, following the global constructional cue, there were significantly more metaphorical items rated as sarcastic than non-metaphorical counterparts,  $\chi^2(1) = 6.7$ ,  $p < .01$  ( $\phi = 0.298$ ). Such results attest to the effect of the superiority of the global sarcastic cue over the local semantically anomalous cue. They thus lend corpus-based support to the findings in Experiment 3.

### Study 2: contextual resonance with automatic constructional interpretations

Study 2 tests prediction (c) (see the Predictions Section above), expecting the natural environment of both, the metaphorical (*S/he is not the brightest marker in the box*) and non-metaphorical constructions (*S/he not the most fascinating speaker around*) to echo their global, constructional, i.e., sarcastic interpretation.

### Method

#### Participants

As in Study 1.

#### Stimuli

As in Study 1.

#### Procedure

Our 3 expert judges (see Study 1) were asked to evaluate

- (a) which of the metaphorical, not metaphorical, or unclear items were echoed by their (prior and/or late) context; and
- (b) whether the interpretation echoed is the sarcastic and/or the literal, anomalous counterpart (see examples 1–2 above).

### Results and discussion

Results show that the environment of most items judged as sarcastic in Study 1, whether metaphorical or not, were considered, by at least two judges, as echoed by their environment via their global, constructional, sarcastic interpretation. Specifically, of the 35 metaphorical items rated as sarcastic, 31 were echoed by their environment; 26 of these 31 were echoed via their sarcastic interpretation (26/31 = 84%, binomial test,  $p < .001$ ). (The remaining five were echoed via their literal interpretation). Of the 26 non-

<sup>12</sup>It might be interesting to note that, an exhaustive search of HeTenTen shows that the coded metaphorical items (*S/he is not the sharpest pencil in the box*) have no literal counterparts, such as *This pencil is not the sharpest one in the box*; *This one* (referring to a pencil) *is not the sharpest pencil in the box*.

metaphorical constructions rated as sarcastic, 21 were echoed by their environment. Of which, 17 were echoed via their sarcastic interpretation ( $17/21 = 81\%$ , binomial test,  $p < .05$ ). (The environment of the remaining four items resonated with their literal interpretation).

Although items were equally divided between metaphorical and non-metaphorical constructions, both involving strong attenuation of highly positive concepts, a significant majority of both groups was rated as sarcastic rather than non-sarcastic (i.e., literal). Interestingly, as before, the metaphorical items affected sarcasm more strongly than non-metaphorical counterparts. Importantly, however, contextual resonance did **not** distinguish between the groups; where the environment was echoic, it indistinguishably resonated with both the metaphorical and non-metaphorical constructions via their default constructional sarcastic interpretation, thus indicating the superiority of this interpretation.

This study, then, testifies to the superiority of the global sarcastic interpretation of these constructions, irrespective of their degree of metaphoricalness.

Will examining contextual resonance with the locally cued metaphoricity of the metaphorical constructions lend further support to the superiority of the global, sarcastic interpretation found in this study? To test this question, Study 3 was run. The aim was to solve the enigma as to whether constructions, here, strongly attenuating highly positive concepts, will affect sarcasm interpretation, irrespective of the involvement of semantic anomaly, which should prompt metaphorical responses unconditionally (Beardsley, 1958), thereby questioning the alleged superiority of the metaphorical interpretation.

### **Study 3: global constructional cue or local semantically anomalous alternative: which reigns supreme?**

In Study 3, we test prediction (d) (see the Predictions Section above), expecting null or close to null contextual resonance with nondefault interpretations. We, therefore, focus here on whether innovative, metaphorically layered interpretations of strongly attenuated highly positive concepts (e.g., *S/he is not the most sparkling drink in the pub*), will be echoed by their environment via their nondefault metaphorical rather than their default sarcastic interpretation. Put differently, will it be the default constructional (here sarcastic) interpretation that will reign supreme, or will it be the semantic anomaly, prompting nonliteralness (Beardsley, 1958), that will gain the upper hand? According to Giora et al. (2015c, 2018b), it is the global constructional constraint, rather than the local semantic anomaly cue itself, that will determine these constructions' end-product interpretation, allowing default interpretations to prevail.

#### **Method**

##### **Participants**

Participants were our three expert judges, who, in Study 1, had rated the 38 metaphorical constructions as metaphorical across the board.

##### **Stimuli**

Stimuli were the 38 metaphorical constructions, rated as metaphorical in Study 1.

##### **Procedure**

The three expert judges were asked to determine whether the natural environment of each of the 38 metaphorical constructions, whether in prior and/or late context, reflects its metaphorical interpretation (irrespective of its sarcastic interpretation and/or resonance with that sarcastic response).

## Results and discussion

Results show that only 4 out of the 38 locally cued metaphorical constructions ( $4/38 = 11\%$ ) were echoed by their environment via their metaphorical interpretation (as determined by at least two judges). Given previous results (see Study 2 above), such (close to null) results further support the superiority of the default, global, constructional sarcastic interpretation of these constructions over their nondefault local, semantically anomalous metaphorical outputs.

Regardless, while being strongly sarcastic, the metaphorically layered stimuli are actually Optimal Innovations. Given that they deautomatize coded conventional constructions (e.g., *S/he is not the sharpest pencil in the box*), they render such stimuli pleasing, more pleasing than their non-metaphorical counterparts (*He is not the most talented kid in the kindergarten*). Indeed, according to the Optimal Innovation Hypothesis (Giora et al., 2004, 2015b, 2017), default, coded stimuli (*S/he is not the sharpest pencil in the box*), when deautomatized (e.g., *S/he is not the most sparkling drink in the pub*) and rendered innovative, will induce pleasure. Deautomatized, Optimally Innovative items are, therefore, expected to be more humorous/pleasing than non-deautomatized counterparts, even though both are interpreted sarcastically when *in or out* of context.

In Experiment 4, we, therefore, tested items' pleasurability. Participants were asked to rate the degree of pleasure of both metaphorical and non-metaphorical items when presented in isolation.

## Experiment 4: pleasurability

The aim of Experiment 4 was to test prediction (e) (see section 2 above), following from the Optimal Innovation Hypothesis, expecting deautomatized coded items to be rated as more pleasing than non-deautomatized counterparts (see Giora et al., 2004, 2015b, 2017).

### Method

#### Participants

Forty-six volunteers, all native speakers of Hebrew (29 women and 17 men), aged 16–74 ( $M = 34.5$ ,  $SD = 13.2$ ), were recruited over the web. Education ranged from 8 to 30 years altogether. Those who indicated their field of expertise graduated from the faculties of Exact Sciences and Engineering, Humanities (both linguists and non-linguists), and Social Sciences.

#### Stimuli

As in Experiment 3. They involved the same 64 items, including the first four buffers. The rest 60 items consisted of 15 metaphorical constructions (such as *S/he is not the most sparkling drink in the pub*) and 15 non-metaphorical counterparts (such as *He is not the most talented kid in the kindergarten*), all extracted from HeTenTen.<sup>9</sup> The additional 30 filler items were extracted from a daily newspaper. All items (including the set of the four buffers) were pseudo-randomly ordered, so that each participant had a list uniquely arranged for her/him.

#### Procedure

Participants were sent a web-link to the experiment. The first two pages of the experiment displayed the instructions, including three examples. Participants were asked to rate each item on a 7-point pleasurability scale, ranging from 1, portrayed as ☹ (i.e., not pleasing), to 7, portrayed as ☺ (i.e., pleasing). Numbers were not indicated on the scale. Participants saw 64 screens and were allowed unlimited time to reflect upon their ratings before pressing a key.

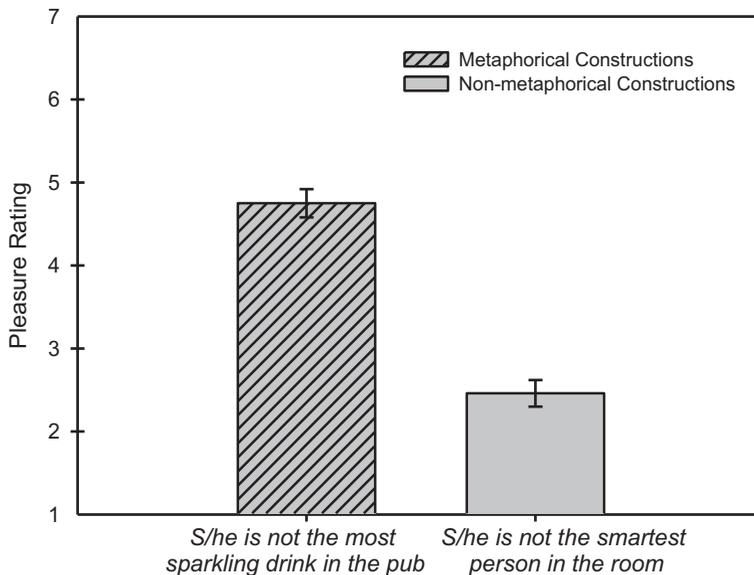


Figure 3. Pleasure ratings of optimally innovative and non-innovative constructions.

### Results and discussion

Results show that, as predicted, the 15 deautomatized metaphorical constructions were rated as significantly more pleasing than the 15 non-deautomatized non-metaphorical constructions, by both participant ( $t$ ) and item ( $U$ ) analyses. Participant analysis reveals that the mean score of the pleasantness of the deautomatized metaphorical constructions ( $M = 4.75$ ,  $SD = 1.16$ ) was higher than that of the non-deautomatized, non-metaphorical constructions ( $M = 2.46$ ,  $SD = 0.99$ ). This difference, 2.29, BCa 95% CI [1.85, 2.74], is significant,  $t_1(45) = 10.20$ ,  $p < .001$ , and represents an extremely large size effect (Cohen's  $d = 1.97$ ). Similarly, the item analysis reveals that, as predicted, the median score of the pleasantness of the deautomatized metaphorical constructions was significantly higher ( $Mdn = 4.67$ ) than that of the non-deautomatized non-metaphorical constructions ( $Mdn = 2.37$ ),  $U = 2.00$ ,  $z = 4.56$ ,  $p < .001$ , exhibiting an extremely large size effect ( $r = 0.84$ ). As predicted, being Optimally Innovative, the deautomatized metaphorical stimuli are most pleasing (see Figure 3 above).

### General discussion

In this research we weighed (corpus-based) metaphorical (*S/he is not the most sparkling drink in the pub*) and non-metaphorical constructions (*He is not the most talented kid in the kindergarten*) against each other, both exhibiting strong attenuation of highly positive concepts, previously shown to affect sarcastic interpretations by default (see, e.g., Filik et al., 2018; Giora et al., 2018a; Giora, Drucker, Fein, & Mendelson, 2015a; Giora et al., 2015c). We tested the prediction that global constructional interpretations will reign supreme, superseding utterance local, internal cues, such as semantic anomaly, known to prompt metaphoricalness unconditionally (Beardsley, 1958). To test this prediction, we ran four off-line experiments and three studies, all corpus-based.

In Experiments 1–3, we tested prediction (a), expecting strongly attenuated highly positive concepts to be rated as sarcastic when in isolation. Findings indeed show that both, metaphorical and non-metaphorical constructions, strongly attenuating highly positive concepts, are interpreted sarcastically. Still, although both kinds of stimuli were rated as sarcastic, the metaphorical stimuli

resulted in significantly higher sarcasm ratings than those of the non-metaphorical counterparts. Doubly layered figurativity, then, enhanced (but did not induce) global, holistic **constructional** outputs.

In Study 1, we tested prediction (b), expecting both, metaphorical and non-metaphorical constructions, strongly attenuating highly positive concepts, to prompt sarcastic interpretation automatically. First, though, we showed that the metaphorical constructions were all rated as metaphorical, as were the non-metaphorical constructions, which were all rated as **not** metaphorical. Regardless, results show that, as predicted, both constructions were rated as **sarcastic**. Still, significantly more metaphorical than their non-metaphorical items were rated as sarcastic. Study 1, then, lends support to the findings of Experiment 3, suggesting that the degree of metaphoricalness does not supersede degree of constructional sarcasm; instead, it enhances it. Global constructional cues, then, override local semantically anomalous alternatives.

In Study 2, we tested prediction (c), following from the Defaultness Hypothesis (Giora et al., 2015a, 2015c), expecting text production to evolve via resonating with default, (here, sarcastic) interpretations. Results indeed show that both, metaphorical and non-metaphorical constructions, strongly attenuating highly positive concepts, were rated as sarcastic and were therefore echoed by their natural environment via that default constructional (here, sarcastic) interpretation.

In Study 3, we tested prediction (d), following from the Defaultness Hypothesis, expecting text production to unfold via resonating with default rather than nondefault (here, metaphorical) interpretations. Although nondefault metaphorical items may amplify the constructional sarcastic interpretations (see Study 1), their environment will not resonate with their metaphorical interpretation, on account of its nondefault, here, metaphorical uniqueness. Results indeed show that resonance with items' metaphorical interpretations is almost nonexistent, thus lending further support to the superiority of the global constructional (here, sarcastic) interpretation over outputs of local cues such as semantic anomaly (prompting metaphoricalness unconditionally, as contended by Beardsley, 1958).

So far, then, results show that the metaphorical layer of these sarcastic constructions contributed to making these constructions significantly more sarcastic. However, being nondefault, they did not affect text production via their metaphoricalness. Still, being nondefault, deautomatizing default, coded meanings (of conventionalized constructions, such as *S/he is not the sharpest pencil in the box*), they are rendered Optimally Innovative and therefore play a major role in affecting pleasure (see Giora et al., 2004, 2015b, 2017). In Experiment 4, we tested this prediction (e).

Indeed, pleasure ratings, collected in Experiment 4, show that the involvement of defaultness (*S/he is not the sharpest pencil in the box*) in non-defaultness (*S/he is not the most sparkling drink in the pub*), the latter deautomatizing the former, affects pleasure; in fact, deautomatizing conventionalized stimuli, even if non-metaphorical (*S/he is not the most fascinating speaker around*), affected pleasure significantly, allowing nondefault deautomatized stimuli to be more entertaining than their default, non-deautomatized, non-metaphorical counterparts. As predicted, being Optimally Innovative (*S/he is not the most sparkling drink in the pub*), deautomatizing default counterparts (*S/he is not the most fascinating speaker around*), rendered the former most pleasing (probably as a result of being also more sarcastic/humorous, as shown also by Experiment 4).

In sum, results of four corpus-based experiments and three corpus-based studies, attested to the predicted dominance of global constructional cues over local semantically anomalous counterparts. Both sarcasm ratings and text production, the latter evolving via resonance with default, constructional sarcastic interpretations, and the pleurability ensuing from deautomatization of defaultness, attest to the superiority of default, global, holistic cues, such as constructional interpretations (à la Goldberg, 2003, 2006), over nondefault local cues, such as semantic anomaly (à la Beardsley, 1958). Put differently, constructional interpretations are analogous to the precedence of the forest before the trees principle, where perceiving the whole precedes its parts (Navon, 1977, 1981; see also Liu & Fan, 2017; Shen, 1993, as cited by Liu & Fan, 2017).

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## Appendix A

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### Non-metaphorical Constructions:

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- (1) The desert in Australia is not the most pleasant place in the world
  - (2) Processed food is not the healthiest food on the menu
  - (3) Joseph is not the nicest guy in the group
  - (4) Jelly is not the most delicious dessert I know
  - (5) This is not the most fashionable dress in the shop
  - (6) You are not the most exciting audience in the country
  - (7) My boyfriend is not the most perfect person I have ever met
  - (8) This movie is not the most fascinating thing
  - (9) My daughter's health condition is not the best
  - (10) This cake is not the most tempting thing in the display window
  - (11) He is not the most dynamic composer in the world
  - (12) The religious parties are not the least costly members of the coalition
  - (13) Richard is not the most genius member of the board
  - (14) Politicians are not the most decent men around
  - (15) He is not the most talented kid in the kindergarten
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**Metaphorical Constructions:**

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- (1) Turkey is not the best pupil in school
- (2) Itamar is not the most absorbent diaper in the pack
- (3) You are not the crispiest Pringle.<sup>13</sup>
- (4) George W. Bush is not the brightest jewel in the box
- (5) This basketball team is not the strongest lion in the cage
- (6) My aunt is not the most yellow peanut-butter snack in the bag
- (7) Michele is not the most pre-moistened towelette in the container
- (8) The iPhone is not the newest player around
- (9) She is not the most glittering marker pen in class
- (10) Ehud is not the sanest pencil in the pencil case
- (11) Moses is not the sharpest tool in the toolbox
- (12) Danny is not the coolest cat on the tree
- (13) My neighbor is not the most Bueno Kinder
- (14) Kinder Bueno is a chocolate bar, popular in Europe.
- (15) This Jeep is not the most muscular guy in the neighborhood
- (16) This British guy is not the most sparkling drink in the pub

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<sup>13</sup>Pringles is an American brand of potato and wheat-based snack chips.