COGNITIVE LINGUISTICS

Editor-in-Chief
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Offprint

Mouton de Gruyter
Berlin · New York

Abstract

The present article focuses on the issue of directionality in three figures of speech, simile, synaesthesia, and zeugma, as it appears in the poetic use of these figures. First, an attempt is made to isolate a certain (structural) level at which these figures of speech manifest an extremely selective preference for certain structural options over others, beyond a specific context (text, poet, school, or period). A textual analysis of extensive poetic corpora corroborates this selective use. Traditional accounts fail to account for such preferences, given their "contextual" orientation, whereas the phenomena under discussion go beyond any relevant specific context.

By contrast, the article provides a cognitive *account for this selective use, arguing that the figures involved conform to a certain cognitive constraint determining their directionality. Empirical data are introduced, based on various psychological tasks, suggesting that the structures selected are, from a cognitive standpoint, "more basic" (e.g., are easier to comprehend and recall, and are more easily conventionalized) than those ruled out. The reason these structures are "more basic" than their counterparts is that they meet a general cognitive constraint. A formulation and a theoretical account of this constraint are proposed and discussed.*

Introduction: Cognitive vs. other constraints on poetic language

Despite the creativity and novelty exhibited in the language used in poetry, any student of literature would agree that (at least some major aspects of) poetic language exhibit certain regularities, that is, conform to certain rules or constraints. The general question of interest here is: What is the nature of the rules or constraints to which even poetic language must conform?

One possible answer pertains to the idea that poetic language is constrained by linguistic rules. Under this view, poetic language is part of

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0936–5907/97/0008–0033

language in general, and as such, has to obey the rules of language (see Reinhart 1972 for a more detailed discussion). One major shortcoming of this view is that it cannot account for the fact that poetic language makes use of only a subset of the formally "permissible" structures (in terms of the relevant formal, syntactic, or semantic rules). To anticipate part of the argument developed later in this article, let us briefly illustrate the point by looking at the structure of the poetic simile. A simile is a linguistic structure of the form "A is like B", where A and B stand for nominals, which are explicitly compared to each other by means of an explicit comparison marker such as *like*, as in "Rage is like a volcano". Note that the rules of our language do not impose any constraint as to the exact noun phrases which A or B can represent. As far as these linguistic rules are concerned, "Reality is like a hammer" is equally well formed as "A hammer is like reality". In one case a (relatively) abstract concept is compared to a (relatively) concrete one, while this state of affairs is inverted in the second case.

Suppose now that an examination of a representative sample of similes occurring in poetry were to yield the finding that the majority of cases conform to the principle that the A term represents a more abstract concept than the B term. Clearly, such a phenomenon cannot be accounted for in terms of formal (syntactic or semantic) linguistic rules, since both structures (A is more abstract than B and B is more abstract than A) are equally permissible as far as such formal rules are concerned.

An alternative route—the one typically adopted by literary critics—maintains that the constraints on the selective use of linguistic structures are *contextual poetic constraints* (pertaining to contextual factors) rather than linguistic ones. Typical contextual constraints pertain to the text from which the similes were taken, the characteristics of the school of poets which produced them, the literary period to which the producer belongs, and so on. Taking into account such contextual factors is the main (perhaps the only) practice of literary critics.

This view of the principles underlying the use of (aspects of) poetic language is capable, no doubt, of accounting for the principled usage of many aspects of poetic language, as the common practice of literary critics frequently shows. This practice, however, is not always the most adequate one. Its major shortcoming is that it cannot account for those regularities found in poetic language which go beyond a specific context (be it a specific text, poet, school, or period). Such regularities cannot be accounted for by a contextually driven account; instead they require an alternative one.

The main proposal of the present paper is that the so-called "cognitive account" provides such an explanatory mechanism. In this view, the regularities characterizing poetic language over and above context conform to *cognitive* rather than linguistic or contextual constraints, i.e., constraints which are derived from our cognitive system and its organizing principles.

In what follows, I will analyze three poetic figures, namely, simile, synaesthesia, and zeugma. The analysis will attempt to answer the following two questions for each of these figures.

1. Is there a selective use of specific options drawn from the formally (linguistically) permissible class of structures for each of the figures in question?

In answer to this question, I will introduce the formally permissible set of optional structures that can be employed by each of the three figures. Then, on the basis of the textual analysis of a large poetic sample, I will point out that poetry makes use of only one fixed selection from among these options—beyond any specific context (text, poet, school, or period).

Let me emphasize the following crucial methodological point with regard to the issue of the selective use of figures in poetic language. The major argument here does not pertain to the differences (or similarities) between the poetic versus the non-poetic use of figures (as might be suggested by the phrase "poetic use of figures"). Rather, it concerns the following question which pertains directly to the characterization of the poetic use of these figures regardless of their non-poetic counterparts: Do poetic figures exhibit any general pattern of preference (beyond specific contexts) for one structural option over another, equally "acceptable", option? For example, do poetic similes prefer the comparison of an abstract concept to a concrete one or vice versa?

Taking the *chance level* as the standard of comparison of the distribution of structures in poetry implies that one can describe the systematic distribution of such structures in poetry, without any reference to whether non-poetic language does, or does not, yield the same pattern. We may, of course, at a later stage, seek a similar characterization of non-poetic language, and it would be extremely interesting to ascertain whether the proposed constraints apply equally to non-poetic language, but this is beyond the scope of the present paper. Since the question has to do with preferences between options potentially implemented in poetic language, the relevant standard is not the distribution of these options within non-poetic language, but, rather, the chance level. That is to say, if the analysis yields significantly higher preferences for one option than the chance level (as I will indeed show), while designating other options as significantly lower than the chance level, then this is a meaningful and significant

result, regardless of whether we compare it to non-poetic uses of the figures in question, or not.

The only case in which reference will be made to non-poetic uses of figures will be the case of similes, where generalizations regarding the distribution of structures in non-poetic language will be introduced. However, this reference is just an elaboration of the basic argument that applies to the distribution of similes *in poetry* (relative to the chance level), rather than a crucial part of the argument itself. No such reference will be made with respect to the other two figures to be analyzed (zeugma and synaesthesia).

2. The second question is: What is the cognitive rationale for such selective use?

In response, I will provide empirical evidence suggesting that the structures selected are, from a cognitive standpoint, "more basic" (e.g., easier to comprehend and recall, and more easily conventionalized) than those ruled out. The reason these structures are "more basic" than their counterparts is that they meet a general cognitive constraint. A formulation and a theoretical account of this constraint will be proposed.

1. Poetic simile

Introduction

Metaphorical comparisons, namely, similes (the terms "metaphor" and "simile" will be used interchangeably throughout this section),[1] are commonly defined as the mapping of properties from a certain source domain onto a target domain (see Lakoff and Johnson 1980, Gentner 1983, and others). Thus, in interpreting "Cigarettes are like time bombs", one maps properties from "the time bomb domain" (the *source domain*) onto the "domain of cigarettes" (the *target domain*). Hereafter I shall use "source domain" and "target domain", and accordingly, "source concept", e.g., "time bombs", and "target concept", e.g., "cigarettes".

Several relevant questions may be posed regarding this mapping between domains such as: How would one identify two components as belonging to two different conceptual domains?, or: Which properties undergo mapping from one domain to another? These issues will not be dealt with here (cf., e.g., Shen 1991, 1992a, 1992b, 1995). Rather, I will focus on the issue of the *directionality* of mapping from the source domain onto the target domain in poetic versus non-poetic metaphors. This issue has become central in the study of *non-poetic* metaphors (e.g., the study of conventional metaphors in ordinary language, or artificial metaphors used in experimental psychology). It turns out that, as far as directionality goes, the distribution of metaphors markedly deviates from chance distribution. Two major generalizations regarding directionality in non-poetic metaphors have been pointed out (cf., e.g., Lakoff and Johnson 1980, Ortony et al. 1985):

(1) Generalizations regarding the directionality of similes:

a. Whenever the two terms of the metaphor differ in their respective level of abstraction, the direction of mapping is from the concrete to the abstract, and not vice versa.

b. When the two terms differ in their respective degree of salience relative to the shared (explicit or implicit) category, the direction of mapping is from the more salient to the less salient, and not vice versa.

(Some representative illustrations of these generalizations appear in the appendix, examples [1] to [4].) There are various sorts of evidence for these generalizations, stemming from the study of conventional metaphors (e.g., Lakoff and Johnson 1980), through the study of directionality in meaning extension (see Sweetser 1984), to psychological aspects of metaphor comprehension (see, e.g., Ortony et al. 1985). A detailed survey of these accounts is introduced in Shen (in press). All this evidence relates to non-poetic metaphors, as previously explained. The question of interest here is whether this pattern of distribution which radically deviates from chance level, is to be found to the same extent in poetic similes. A positive answer to this question would yield a positive answer to the question of whether poetic similes exhibit a selective use, compared to chance distribution, among the formally (linguistic) permissible structures that lie at its disposal.

1.1. *Selective use of options in poetic similes: A textual analysis*

To investigate this matter, I chose a corpus of 400 similes selected from four corpora of Hebrew poetry. The similes were all "closed" similes, i.e., similes containing an explicit mention of their grounds of comparison, having the form: "A is like B in the sense of C".[2]

One hundred of these 400 similes were selected from the first corpus, consisting of poems published during the period known as the "Revival" of Hebrew poetry by the following major poets: Chaim Nakhman Bialik, Ya'akov Steinberg, Saul Tschernikhovsky, and Zalman Shneor. The second corpus represents the "Modernist" generation of Hebrew poets, and includes poetry by Avraham Shlonsky, Nathan Alterman, Leah Goldberg, and Alexander Penn. The next 100 similes were drawn from poetry written by those traditionally known as the "State-Era" poets—Nathan Zach, Yehuda Amichai, David Avidan, and Uri Bernstein. The

last 100 similes were selected from Hebrew poetry published during the 1980s, by the following poets: Yonah Vollach, Dalia Rabikowitz, Yehuda Amichai, and Yair Horowitz. The similes taken from each poet were selected at random from his/her poetry, in order to avoid biasing the analysis.

The rationale behind the analysis

Let me explain the rationale underlying this analysis, which is admittedly highly irregular in studies of literary theory. Since this rationale underlies the subsequent analyses of both zeugma and synaesthesia, I will elaborate on it. The question is: What justifies the generalization from tendencies within a given poetic corpus to poetry in general? Several factors appear to be characteristic of the corpus analyzed, enabling us to extend the validity of the conclusions drawn to "poetic metaphors" at large. Two of these are:

1. The corpus under consideration comprises similes taken from 16 different poetic corpora, each four representing a different stage in the history of Hebrew poetry. The similes were selected from poetry written by several prominent poets, whose individual poetry is markedly different from that of the other poets belonging to the same "generation". Further, the metaphors for this investigation were selected from the work of each poet entirely at random; the same number of similes were drawn from each poet's work in a non-tendentious manner. It is thus fair to assume that the structural pattern emerging from this analysis could not be attributed to contextual factors, such as the particular poem from which the similes were excerpted, the individual poet who composed them, or the particular "generation" or "school of poets" with which a given poet is affiliated, and so on. Needless to say, neither is there any reason to assume that the fact that the similes in question were originally written in Hebrew affected their directionality in any way. It is worth noting that similar considerations have motivated other studies of poetic figures, employing a similar methodology (see, for example, Ullmann's 1952 study of poetic synaesthesia, MacKay's 1986 study of poetic personification, and Shen's 1987 study of the poetic oxymoron).
2. These four corpora do not simply represent four *different* historical periods in the evolution of Hebrew poetry, but also indicate four periods which somehow stand in marked opposition to one another as far as their ascribed poetic characteristics are concerned. This results from the well known "struggle" between generations in poetry, characterizing literary evolution in general. Thus, each generation of modern Hebrew poets perceives its own poetic principles as a response to, or a reaction against, those of the previous generation, and accordingly constructs an alternative poetics, as testified by the poetic manifestos, essays and articles written either by the poets themselves, or by their critics. (Hebrew poetry is, of course, not unique in this respect.) It would, therefore, be reasonable to assume that poetic tendencies allegedly prevailing in a given period are likely to be rejected by the producers of a subsequent period, and their strategies will in turn be rejected by those of the next period, and so on. Thus, the four corpora which appear to be antithetical to each other allegedly exploit a large scale of existing options at their disposal regarding the structuring of poetic metaphor across particular poetic contexts.

Obviously, one could argue that for any set of figures some relevant context can be reconstructed, like modern Hebrew Poetry, or modern Hebrew and English poetry, or the poetry of the seventeenth and eighteenth centuries, and so on. However, if one takes seriously the idea of contextual constraints, one has to point out the specific factors operating in any given context (which in itself consists of a set of contexts, such as the various poets from whom the sample was taken and so forth)—factors which may have constrained the particular use of similes. Let me state right at the outset, that no such contextual factors uniquely characteristic of the corpora selected can reasonably be isolated to account for the strong pattern of selective use displayed.

The procedure of analysis

First, all 400 similes were analyzed according to the scale of abstraction, namely, to determine whether they conform to (1a) above. (In fact, the analysis was a more elaborate one, but here I will restrict myself to that part of the analysis which pertains to the above generalizations; the reader interested in the fuller analysis is advised to consult Shen 1995.)

Abstraction. The 400 similes were first analyzed with respect to the first generalization; that is, we computed the number of cases in which the source was more concrete than the target—a representative example being "Emptiness is like a weight, heavy on the heart"—with the number of cases displaying the opposite directionality, i.e., where the target is more concrete than the source, as in "The flowers blossom like a dream".

Salience. This factor was analyzed for those similes in which the two terms were equally concrete, but one of the terms represented a more salient concept than the other. In such cases, we simply compared the number of instances conforming to the above generalization—namely, that the mapping is from the more to the less salient component, as in "A flock of birds leaves a trail like a jet airplane"—with the number of mappings from the less to the more salient term, as in "The fire is hot like a cloud".

Scoring. In order to measure the abstraction or salience of the concepts analyzed, the following scoring method was used.

Four independent judges (students from the Department of Poetics and Comparative Literature at Tel Aviv University) were given a four-point scale for both abstraction and salience. They were asked to score the concepts comprising the 400 similes for abstraction and salience. Two of them scored the similes from the first two periods, while the other two scored the remaining two periods.

The criteria the judges were required to use were the following. On the abstraction four-point scale, the criterion of the "imagery value" of the concept in question (i.e., the extent to which one can create a concrete image of the concept), was employed. The range varied from concepts having the highest imagery value (4 on the abstraction scale) to those having no visual or auditory representation (scored 1). (See Rosch's 1978 study of the notion of the "basic level" of abstraction, and the pictorial representation of terms on this level of abstraction.)

The criterion for the salience of a given concept (relative to its "category" represented by the simile's ground) was the extent to which the concept in question could be regarded as a prominent (prototypical, important) member of the category represented by the simile's ground. For example, in "The fog scratching its back like a cat", the ground "scratching its back" constitutes an ad hoc category (i.e., "things that scratch their backs") of which "cat" is (relatively) a more salient member than "fog". By contrast, in the case of "Evening skies stooped like the blowing of a trumpet," the category constructed is: "things that lean" (which is constituted by the ground "stooped"); for such a category neither "evening skies" nor "the blowing of a trumpet" are viewed as salient members. (I will elaborate on this notion of "ad hoc category" in the section on zeugma.)

For both scales the concepts which scored lower (1 or 2) were classified as "abstract" and "non-salient", while those identified as belonging to the two higher degrees (3 or 4) were classified as "concrete" and "salient", respectively.

Prior to the analysis, all four judges were asked to provide their judgments with respect to 60 randomly chosen samples, in order to establish their reliability. Their judgments were compared, and showed a high rate of matching (judgments of abstraction appeared to be more homogeneous [approximately 85 percent] than judgments of salience [approximately 75 percent]). Most differences were resolved following a discussion, and agreement was reached in 85 to 90 percent of the cases. Almost all the remaining cases were cases in which the difference between judgments was not higher than one point on the four-point scale. Having established the judges' reliability, the judges were asked to provide their assessments. The agreement within each pair of judges reached 85 to 90 percent, while disagreements were usually resolved through discussion. In the very few cases where no agreement was reached, the similes were replaced by new ones.

Results

All metaphorical comparisons selected from the corpus were divided according to whether they represent "standard" similes (i.e., similes conforming to one of the generalizations in [1]) or "reversed" ones (i.e., similes exhibiting the reversed directionality). With regard to the abstraction scale, "standard" similes are those in which a concrete concept is mapped onto an abstract one, while "reversed" similes are those in which an abstract concept is mapped onto a concrete one. As to the salience scale, "standard" similes are those in which a salient concept is mapped onto a non-salient one, while "reversed" similes are those in which a non-salient concept is mapped onto a salient one. (see examples [1] to [4] in the appendix).

The results are given in Table 1 (which provides the overall summary of the four historical periods). A more detailed analysis appears in Tables 1 and 1b.

The results can be summarized as follows. Cases in which the two concepts differ in their levels of abstraction (i.e., one being concrete and the other abstract) constituted 182 of the 400 similes, and are divided as follows: 148 similes (81 percent) display an abstract–concrete structure, while 34 similes (19 percent) display a concrete–abstract structure.

The remaining 214 similes (there were four unclear cases) show no discrepancy in levels of abstraction (of these 204 similes, i.e., 95 percent, display a concrete–concrete structure while the other ten, i.e., five percent, display an abstract–abstract structure).

The 214 similes for which no differences were found between the abstraction level of the two concepts compared were further analyzed

Table 1. *Overall summary of the two scales (abstraction and salience), and types of directionality ("standard" vs. "reversed" directionality)*

	Scale of abstraction	Scale of salience
The "standard" directionality	148 (81%)	77 (73%)
The "reversed" directionality	34 (19%)	29 (27)

Table 1a. *Scale of abstraction according to generations of poets (in percentages)*

Directionality	Revival	Modernism	1960s	1980s	Sum (mean)
"standard"	21 (75%)	51 (81%)	41 (80%)	35 (87%)	148 (81%)
"reversed"	7 (25%)	12 (19%)	10 (20%)	5 (13%)	34 (19%)

Table 1b. *Scale of salience according to generations of poets (in percentages)*

Directionality	Revival	Modernism	1960s	1980s	Sum (mean)
"standard"	19 (61%)	15 (85%)	19 (79%)	24 (69%)	77 (73%)
"reversed"	10 (34%)	3 (15%)	5 (21%)	11 (31%)	29 (27%)

with respect to their salience. Of these, 106 showed a difference in their level of salience, as follows:

77 (73 percent) non-salient–salient
29 (27 percent) salient–non-salient

Of the remaining 108 similes that were analyzed further, 90 (83 percent) displayed a non-salient–non-salient structure, while only 18 (17 percent) exhibited the salient–salient structure.

Recall that the general hypothesis being tested here is that the above similes deviate from chance distribution for both scales ("abstraction" and "salience") across all four corpora. This hypothesis was tested in each corpus using the binominal test. Let us introduce the results for both scales.

Abstraction. For all four corpora the results were significant, and consistent with the hypothesis stated above; the "standard" similes (abstract–concrete) by far outnumbered the "nonstandard" ones (concrete–abstract). The results were:

Revival—$p<0.02$
Modernism—$p<0.001$
1960s—$p<0.001$
1980s—$p<0.001$

Salience. The hypothesis that the similes deviate from chance distribution was tested in each corpus using the binominal test. For three out of the four corpora the results were significant, and consistent with the hypothesis stated above; the "standard" similes (non-salient–salient) by far outnumbered the "nonstandard" ones (salient–non-salient). The results of the test for the revival corpus were not significant, but from looking at the data one can easily observe that the tendency to prefer the standard similes manifests itself here too: 19 of the cases exhibited the standard direction, whereas only ten displayed the nonstandard one. Since the results of the revival corpus were not significant, the hypothesis was also tested for all four corpora jointly, and the hypothesis was confirmed here too ($p<0.001$). The results are:

Revival—$p=$ns
Modernism—$p<0.01$
1960s—$p<0.01$
1980s—$p<0.05$

Discussion

The main findings of this analysis indicate that the poetic simile is highly constrained with respect to the distribution of the various permissible structures: it conforms to the generalizations regarding abstraction and salience, far beyond chance distribution, while minimizing the use of the opposite directionality to significantly below that level.

A closer look at the four periods which were analyzed (see Tables 1a and 1b) provides even further support for this conclusion. The above pattern was consistent across the four literary corpora examined. In particular, it should be emphasized that the variability between corpora was relatively low, as indicated in Tables 1a and 1b and the statistical analyses that accompany them. Note, that on the abstraction scale, the ranges between periods were between 75 and 87 percent for the "abstract–concrete" order versus 13 to 25 percent for the "reversed" order; on the salience scale, the percentages ranged from 63 to 85 percent for the "non-prototype–prototype" structure, and from 15 to 37 percent for the reversed structure.

These results clearly suggest that literary figures are not mainly governed by contextual constraints. Such a view would seem to predict that different literary "schools" (represented here by the four poetic corpora) differ significantly in their use of literary figures. If the contextual constraint theory is correct, the way similes are used in the different schools should be different. However, the differences between the four schools are far from statistically significant. We may, therefore, conclude that

there are at least *some* important aspects of similes which are not context-governed.

1.2. *The cognitive account*

Having established that poetic similes use a restricted range of options, we might ask: What is the *cognitive* constraint structuring these similes (assuming that the relevant constraint is neither a linguistic nor a contextual one). Generalization (2) introduces the proposed constraint.

(2) A "less accessible" concept is more likely to be transformed into a "more accessible" one, than vice versa. Put differently, a more accessible concept is more likely to be used as a cognitive reference point (see Rosch 1975) for its less accessible counterpart than vice versa.

The key notion in this proposal is that of "cognitive reference point". This notion is taken from Rosch's 1975 study of natural categories. (Rosch herself views the proposal as stemming from the notion of "ideal types" originally introduced by Wertheimer in his studies of perception.) Her idea is that for various stimuli (perceptual as well as conceptual), a distinction can be drawn between the "reference stimulus" (assumed to be "more accessible") and "stimuli which deviate from the reference stimuli" (assumed to be "less accessible"). In order for a stimulus to be defined as a "reference point" within a category, it "must be shown to be one which other stimuli are seen 'in relation to'" (1975: 533).

The hypothesis underlying Rosch's study is that "stimuli slightly deviant from reference stimuli are more easily assimilated to, and thus, judged metaphorically 'closer to' the reference stimuli, than vice versa" (1975: 533). For example, a square with totally imprecise, lopsided lines (a carelessly drawn square, for instance) will be perceived as (a variation of) a square, yet a right-angled square will never be considered (a variation) of a lopsided, imprecise square. Another example cited by Rosch (1975) is that subjects will perceive the figure 97 (representing a concept of low conceptual accessibility, that is, of "lesser form") as 100, but will never perceive the figure 100 as 97. Subjects describe an 87-degree angle as "in effect" a 90-degree right angle, but not vice versa.

So stimuli consisting of "a good form" (in the well-known Gestaltian sense), i.e., "more accessible" stimuli, are more likely to serve as cognitive reference points for stimuli which have a "lesser form", i.e., "less accessible" stimuli.

Relating this notion to the factors used in analyzing poetic similes (namely, abstraction and salience), the notion of "good form" is interpreted on the abstraction and salience scales in the following way. A concrete and/or salient concept has a "better form" than a less concrete or less salient one, *ceteris paribus* (see Tversky 1977, Rosch 1975, Reinhart 1984).

Given these considerations, accounting for the selective use of the poetic similes follows directly. Since the better form is regarded as the (conceptually) salient and relatively concrete one (cf. Rosch [1975], Tversky [1977], and Reinhart [1984]), and since it is possible to regard a lesser form as a variant of a better form, but not vice versa, the fact that (almost) no second-degree violation occurs in poetic similes may be explained as follows: transforming a "good form" (a concrete term, or a salient concept) into a lesser form (that is, into an abstract term or into a non-salient concept) yields a violation of the constraint mentioned in (2), and therefore such structures are to be found significantly below chance level.

What evidence might support the cognitive constraint in (2) (applied to similes)? That is: What is the evidence for the claim that violating this constraint results in a "less natural" and (relatively) difficult-to-process metaphor compared with its inverse? Let me briefly review some of the evidence with respect to the two variables analyzed (abstraction and salience).

The abstraction variable

The evidence for (2) with respect to abstraction (concreteness) rests on various psychological findings. For example, in the study conducted by Katz, Paivio, and Marschark (1985), it was found that metaphorical sentences tend to be judged as (metaphorically) meaningful if the "source" term (but not the "target" term) is more concrete, and therefore more readily accessible to a subject's imagination. The rapidity with which judging subjects process metaphors and remember them, changes in proportion with their ability to create an image of the source domain. These findings lead the authors to conclude that subjects prefer to use a concrete, rather than an abstract, source concept. This finding also confirms the idea that if the source concept (the vehicle in the authors' terminology) were not concrete, the comparison would tend to be an anomalous one, that is, it would have no meaning, or would be especially difficult to understand.

Additional, less direct, support for the claim that yielding to the above constraint would result in a more "natural" and "basic" structure than its violation, comes from a linguistic analysis of conventional metaphors.

The well-known analysis by Lakoff and Johnson (1980) covers a wide range of conventional metaphors used in ordinary language. One of its

major findings is that the directionality of metaphors more likely to undergo conventionalization in language appears to be that based on the mapping from a more concrete to a more abstract domain, rather than vice versa. In fact, Lakoff and Johnson found virtually no instances where the source domain was more abstract than the target domain. The conventional metaphor "Love is a journey", is a typical example. Here, terms from the source domain "journey" are mapped onto the target domain "love". This mapping underlies conventional metaphorical expressions such as "The lovers have reached a crossroads"; "Where do we go from here?"; "Where is all this leading to?"; and so on. Typically, the source domain is more concrete than the target domain in a wide range of conventional metaphors, and mapping in a contrary direction does not occur.

The salience variable

The evidence for (2) with respect to salience rests primarily on recent psychological studies which suggest that metaphorical structures conforming to the "standard" directionality are more "basic" (in a psychological sense) than those which do not conform. In general, when a given metaphorical comparison conforms to the "standard" directionality (as in [1]), it outranks the opposite direction on various dimensions.

Similarity between two concepts. Tversky (1977) and Ortony, Vandruska, Foss, and Jones (1985) point out that when the source concept is of higher salience than the target concept, the similarity between the two terms compared is judged as higher than when the order is inverted.

Order preference. Subjects (asked to choose a preferred order) prefer "standard" directionality to its opposite.

Appreciation of metaphorical comparisons. Metaphors are more greatly appreciated in the "standard" directionality than vice versa (see Ortony et al. 1985).

Recall. Johnson and Malgady (1980) point out that metaphors obeying "standard" directionality are more effectively remembered.

Sentence completion. Verbrugge and McCarrell (1977) note, for example, that in samples of completed metaphorical sentences there appears to be a preference for the second member (the metaphorical vehicle, to use the terminology of I. A. Richards) as more salient than the first one (the tenor), relative to the basis of similarity.

This evidence suggests that the directionality in question is indeed basic or pertains to the basic cognitive ease of processing, for implied throughout all the evidence, in one way or another, is the fact that this directionality is the most simple and the least complicated to process, and that for this reason it is preferred by subjects, is remembered more effectively, etc.

In summary, then, the present characterization of the directionality of poetic metaphors establishes that poetic metaphors are highly selective with respect to their directionality. The account proposed suggests that this selective use can be explained by the adherence of poetic similes to the cognitive constraints in (2). It might very well be the case that the cognitive constraint may guarantee that the violation of norms and conventions of non-poetic language will not develop in an uncontrolled fashion into senseless, or extremely difficult, uses of language.

2. Poetic Synaesthesia

Introduction

Synaesthesia has attracted the attention of researchers in various disciplines: literary criticism, linguistics, cognitive psychology, developmental psychology, and so on (see Ullmann 1952; Marks 1982; Osgood 1980; Tzur 1992, inter alia). An instance of synaesthesia (Greek, 'feeling together') is usually defined as conveying the perception of, or describing, one sense modality in terms of another, e.g., perceiving or describing a "voice" as "velvety, warm, heavy, or sweet", or a "trumpet-blast" as "scarlet" (see Preminger 1975; Shipeley 1970).

Several questions can and have been raised with regard to synaesthesia, such as: What is the basis for finding similarities between two concepts belonging to two distinct senses? To what extent is this phenomenon universal? Are there any differences between poetic and non-poetic uses of synaesthesia? When does the ability to interpret synaesthesia develop and so on (see, e.g., Marks 1982)? One of the major issues is, no doubt, that of *directionality of mapping*. A synaesthetic metaphor is based on the mapping of properties from one modality (sense)—the source modality—to another—the target modality. For example, in the synaesthetic metaphor "a sweet sound", the mapping proceeds from the source, the "taste" domain, onto the target belonging to the domain of "sounds".

The question of interest here is whether the directionality of the mapping is used in a principled way, or whether any modality can be mapped onto any other. In other words, does poetic synaesthesia exhibit a selective use of structural options with respect to the directionality of its mapping?

This, of course, is an empirical question which has to be answered on the basis of a textual analysis of a large poetic corpus. If directionality in synaesthesia is used in a principled way, as indeed I will argue, the question which immediately arises concerns the rule-governed behavior of synaesthetic metaphors. In response, I argue, on the basis of some empirical findings, that poetic synaesthesia conforms to a cognitive constraint which blocks certain options with respect to directionality while favoring others.

2.1. *Selective use in poetic synaesthesia: The textual analysis*

I. Directionality in poetic synaesthesia: Ullmann's analysis

The present analysis draws directly on Ullmann's seminal study of poetic synaesthesia (Ullmann 1945: 813–817). Ullmann's main assumption is that the modalities can represent a range of options on a distinctiveness scale: from the most distinct modality to the least distinct one. The most distinct modality is *sight*, followed (in this order) by *sound*, *scent*, *taste*, to the least distinct sense, namely, *touch*. With respect to this "distinctiveness scale", Ullmann's main observation regarding directionality of mapping in synaesthesia is introduced in (4).

(4) Poetic synaesthesia systematically prefers to map terms of lower distinctiveness onto terms of higher distinctiveness, rather than vice versa.

Compare, for example, the following two instances of synaesthesia: "A cold light" or "A lighted coldness". The first instance conforms to the above generalization: the target (i.e., the metaphor's topic) "light" represents a term belonging to the highest point in the distinctiveness scale—namely, *sight*—while the source (the metaphor's modifier) represents a concept belonging to the lowest point on that scale—*touch*. Thus, the direction of mapping from source to target conforms to the above generalization. By contrast, the other synaesthetic metaphor—"a lighted coldness"—represents the opposite directionality, from a higher to a lower term.

Ullmann's generalization states that in the literary corpus he examined, the clear-cut tendency emerged (with a relatively small number of exceptions) to use synaesthetic metaphors such as "a cold light" rather than their inverse.

As in the case of poetic simile, chance distribution serves as the standard of comparison here. In other words, the claim is that for a given poetic corpus the incidence of the mapping of terms of lower distinctiveness onto higher ones is significantly higher (while its inverse is significantly lower) than a chance distribution.

There is, however, one exception to this generalization, which relates to the two highest modalities (i.e., *sight* and *sound*). Ullmann points out that when an instance of synaesthesia consists of these two senses, each one of them is equally likely to become either the target or source concept. The reason for this is not clear, though Ullmann himself, as well as other researchers (e.g., Tzur 1992), have provided some initial suggestions.

Keeping this reservation in mind, we should note that Ullman established the above generalization on the basis of a thorough analysis of over 2000 synaesthetic metaphors which were extracted from the texts of eight anonical corpora (mainly poetic), from three different European literary sources: English, French, and Hungarian poetry.

In order to find out whether this generalization can be extended to other, nonrelated corpora, I analyzed another 130 synaesthetic metaphors drawn from modern Hebrew poetry. This corpus introduces a different set of poets, belonging to a totally different cultural environment and to a different period (the twentieth century as opposed to the nineteenth). The results clearly indicate that the Hebrew corpus conforms fully to the generalization in (4).

II. Analysis of the Hebrew corpus

The Hebrew corpus consisted of 130 instances of poetic synaesthesia which were taken from the writings of 20 modern Hebrew poets active during the first eighty years of the twentieth century. The poets represented belong to four different historical periods in the evolution of Hebrew poetry, periods which, as previously mentioned, vary substantially with respect to their ascribed poetic characteristics.

Unlike the case of similes, it was clear right from the outset that synaesthetic metaphors are less prevalent in poetry. Thus, even a thorough examination of a large set of poems yielded a relatively restricted number of synaesthetic metaphors (when compared with, e.g., the number of similes found in the writings of these poets). Furthermore, poems vary significantly in the amount of synaesthesia they use. Some poets use this figure abundantly, while others employ it on a very small scale. Therefore, it was impossible to extract an equally high number of instances from poets during each period.

An alternative procedure, designed to avoid unnecessarily skewing the corpus analyzed, consisted in collecting as many synaesthetic metaphors as we could find, in poems written by various Hebrew poets belonging to different periods. The rationale behind collecting a heterogeneous

sample with respect to periods is similar to the one introduced in the same of similes.

Let me point out, however, that the justification for such a rationale is even greater in the case of synaesthesia than in the case of the poetic similes, in that here the generalizations regarding the structure of poetic synaesthesia extend beyond the boundaries of a specific national literature. The fact that the four poetic corpora (the three analyzed by Ullmann and the one analyzed by myself) cover four national literary corpora provides even stronger support for the generalization proposed.

All 135 examples of synaesthesia collected were analyzed on the scale of distinctiveness. This analysis was conducted by two judges who were asked to provide their judgments as to the directionality of all 135 instances. Their judgments were compared, and showed a high rate of agreement (approximately 90 percent). Most differences were resolved following a discussion, and agreement was reached in approximately 95 percent of cases. The very few cases (five) for which no agreement was reached were discarded. This procedure left us with 130 synaesthetic metaphors (see examples [5] and [6] in the appendix for two representative examples).

The results were straightforward. Of the 130 cases, 95 (i.e., 75 percent) were in accordance with the above generalization; 23 (18 percent) were neutral with regard to the generalization (i.e., consisted of the "sound–sight" combination); and only ten cases (i.e., seven percent) were inconsistent with the generalization. A binominal test revealed that the instances of synaesthesia found in our sample do exhibit a preferred directionality, as was hypothesized above, i.e., the two senses do not appear to map randomly. Rather, the lower terms in the hierarchy tend to map on the higher terms significantly more than the other way around ($p < 0.001$).

This straightforward result clearly suggests that, despite the relatively limited nature of sampling conducted for Hebrew poetry, Ullmann's generalization reflects a more widespread pattern that can be extended to other literary corpora beyond the European literary ones.

2.2. *The cognitive account*

Introduction

How do we explain the preference for mapping from low values onto high ones on the distinctiveness scale, rather than vice versa? The answer I propose proceeds along the lines introduced in the case of poetic similes. First, I argue that the tendency in question reflects a preference for a more "natural" or "basic" structure over its inverse. Some empirical evidence which supports the argument, based mainly on a recall experiment I conducted, is reported.

Further, I propose that the naturalness of the "low to high" mapping follows from the same general cognitive constraint previously introduced with respect to the poetic simile. Generally speaking, this constraint states that a mapping from more "accessible" or "basic" concepts onto "less accessible" or "less basic" ones seems more natural, and is preferred over the opposite mapping.

Taken together, these two arguments yield the claim that, from a cognitive perspective, conforming to this constraint yields a more "natural" figure than violating it; the prediction is that a figure which conforms to this constraint will be judged by subjects as more natural, will be better recalled, will be easier to understand, and so on.

My next step is thus to examine the hypothesis that an example of synaesthesia which conforms to the above proposal is indeed "more natural" than its inverse. There are various psychological measures by which one can measure the relative "naturalness" of verbal structures. For example, one may adopt a direct route, namely, one may ask subjects to provide their judgments as to which of two (or more) structures appears to them to be "more natural" or "more sensible". And indeed, in an informal test we conducted, we presented 20 informants (undergraduate Hebrew native speakers) with a set of 31 pairs of synaesthetic metaphors taken from poetry; each pair consisting of a metaphor extracted from a Hebrew poem (e.g., "a cold light") and a counterpart consisting of the same modalities but reflecting the opposite directionality ("a lighted coldness"). The order in which the two synaesthetic metaphors in each pair was presented was randomized across pairs (i.e., in half of the cases "the original" metaphor was presented first and its artificially constructed counterpart second, while in the other half, the order was reversed).

After making sure that neither structures seemed familiar to the informants, we asked them to indicate for each pair which of the two sentences seemed "more natural" and "more sensible". They were also given the option of "unable to decide". The hypothesis was that subjects would prefer the "low to high mapping" as "more natural" than its inverted counterpart.

The results confirmed the hypothesis. Thus, out of 620 judgments made by our informants (31 synaesthetic metaphors multiplied by 20 informants), 453 judgments (73 percent) conformed to our hypothesis, while only 102 judgments (16.4 percent) conflicted with it, and 65 (10.4 percent) judgments were neutral (i.e., reflected an inability to decide). Although no parametric analysis was conducted, it was quite clear that these results

were consistent across subjects, and across various modality mappings. Thus, for each subject the numbers of judgments compatible with the hypothesis ranged from 13 to 28 (22.6 on average), while those which conflicted with the hypothesis ranged from one to ten (five on average).

A closer look at the results reveals that most of the judgments which conflicted with the hypothesis consisted of the *sight* to *sound* transfers, which is in accordance with Ullmann's findings.

This test gave us some initial indication as to people's preference with regard to directionality in the synaesthetic metaphor. It is, however, a very partial indication, in several respects. For one thing, it only tested a very general tendency with regard to synaesthesia; thus, the number of all possible modality transfers was not equal, although all modality transfers did exist in the stimuli. Second, the "direct" measure of subject's preference relies heavily on the conscious awareness of the subjects, which is a somewhat problematic measure since it may be influenced by various factors unrelated to directionality.

We therefore conducted a further experiment in which these shortcomings were remedied. To do so, we used a recall task, that is to say we employed a measure less dependent on the subjects' direct conscious judgment, but one that, nevertheless, reflects their "real" preferences. This recall task compared recall for structures conforming to generalization (4) to recall for their inverted counterparts. While eliminating subjects' conscious decision making, this measure nevertheless may give us some indication as to which of the alternative structures is better recalled. Following a commonly held assumption in this field (see e.g., Thorndyke 1977), it was supposed here that a structure which is better recalled is "more natural" or "more basic" than its counterpart which is less so (all other things being equal).

The experiment

Subjects. 95 subjects (two groups of 42 and 53 undergraduate students from Tel Aviv University, Faculty of the Humanities) participated in the experiment, on a voluntary basis.

Materials. A list of 24 synaesthetic metaphors was constructed, based on real synaesthetic metaphors taken from various modern Hebrew poems. Half of them conformed to the "standard directionality" (according to Ullmann's scale), namely, their source concept (the modifier) represented a less distinct sense than their target (the subject), as in "a sweet silence", while the other half reflected a "nonstandard directionality", that is, their source concept represented a more distinct sense than their target, such as "a lighted coldness". The motivation for using real metaphors for both standard and nonstandard directionality (rather than artificially constructed examples) was to prevent accessing any "natural" variable, other than the hierarchy of distinctiveness postulated by Ullmann.

For each of the 24 synaesthetic metaphors in the original list a corresponding "inverted" instance of synaesthesia was constructed, resulting in another 24 metaphors. Thus, for the 24 original examples of synaesthesia conforming to the standard or nonstandard directionality, there were 24 instances of synaesthesia with the identical components but in inverse positions (e.g., "sweet silence", i.e. a standard directionality example of synaesthesia, in the original list corresponded to "silent sweetness" in the constructed list).

On the basis of these two lists (the original and its corresponding "inverted" metaphor), two sets of synaesthetic metaphors were constructed. Set 1 consisted of the first 12 metaphors from the original list and the 12 last metaphors from the "inverted" list, while Set 2 consisted of the remaining synaesthetic metaphors in the original and inverted lists. Each of the two sets thus contained examples identical in their components to those included in the other set, but in inverse positions. The two lists were hence counterbalanced.

The synaesthetic metaphors in each set were randomly presented to the subjects. For each subject a recall measure was applied for "standard directionality" metaphors, and for cases of nonstandard directionality. The former instance was measured by counting all the synaesthetic metaphors that subjects recalled "correctly" (i.e., according to the order in which the instance of synaesthesia appeared in the version presented), as well as those examples of synaesthesia that were recalled "incorrectly" (i.e., those whose components were recalled, but in a different order from the version actually presented to subjects). The same method was applied to the measurement of recall for nonstandard synaesthetic metaphors.

Procedure. The experiment was run in a classroom. Each of the two groups of subjects (one consisting of 42 participants, the other of 53) were given a sheet of paper containing a different set of synaesthetic metaphors (Set 1 and Set 2) as previously described.

The experiment was carried out in two stages. In the first stage, the subjects were asked to read the pairs which were simultaneously read aloud to them by the experimenter. This was done to enhance their recall by giving the subjects both visual and auditory exposure to the pairs. The subjects were previously told that they would have to perform a recall task involving these pairs at a later point. After the experimenter

had finished reading, the questionnaires were collected by the experimenter and the subjects were given blank sheets of paper. After a pause of five minutes, the subjects were asked to write down as many of the word pairs previously presented as possible. They were given ten minutes to accomplish the task, after which time the experimenter collected their protocols.

Results. A t-test analysis was conducted. As predicted, the recall for "standard synaesthesia" was significantly higher than for "nonstandard synaesthesia"—($t(94)$ 3.794, $p < 0.005$). That is, subjects tended to recall much better instances of synaesthesia in which the source represented a sense lower in the hierarchy than the target.

Discussion. How might we explain this finding? Let me propose, in a somewhat speculative manner, an account which is derived from Tzur's (1992) analysis of Ullmann's findings as well as on some undeveloped observations made by Ullmann himself. In general, the idea is that the naturalness of the low to high structure follows from the same general cognitive constraint which has been previously introduced with respect to the poetic simile. Recall that this constraint states that a mapping from more "accessible" concepts onto "less accessible" ones seems more "natural," and is preferred over the opposite mapping.

In general, so the argument goes, modalities which are low on the above hierarchy are more accessible than modalities highly placed in the hierarchy. There are at least two factors which increase or decrease the accessibility of the perceived entity to the perceiver.

1. The directness of the contact between the sense which perceives and the perceived entity: lower modalities exhibit direct contact (e.g., *touch* and *taste*, and to some extent even *scent*) while higher modalities (*sight* and *sound*) exhibit no such contact.
2. The existence, or lack thereof, of a special organ in the human body by means of which the entity is perceived. Thus, the lowest modality (*touch*) does not use a special organ, while the other modalities do use such organs. The organ exists on an intermediate level between the perceiver and the perceived entity, and, therefore, contributes to the latter being "less accessible" to the perceiver.

Taken together, these two factors may contribute to the degree of accessibility of the entity perceived via the modalities involved. Thus, the lower the modality, the more direct and the less mediated are the relations between the object perceived in terms of that modality and the perceiver. The entities perceived through *touch* (and the sixth sense which is included in Ullmann's hierarchy, namely, *heat*) are the least mediated (since they are characterized both through direct contact and the lack of a specific mediating organ), followed by *taste* (which involves direct contact, but is mediated via a perceiving organ), followed by *scent* (which displays an even smaller degree of direct contact), followed by *sound* and *sight* (which bear the most remote contact compared with the other perceived entities mentioned.

In sum, the cognitive constraint previously introduced can account for the generalization regarding directionality in synaesthesia. Naturally, the parameters within which the "accessibility hierarchy" is defined in the case of synaesthesia differ from those which are applicable to similes. However, given these parameters, one may conclude that the same cognitive constraints apply both to the structure of poetic similes and instances of poetic synaesthesia. In the next section, we will extend the applicability of this constraint further to the third figure of speech, zeugma.

The account I have proposed, which is a development of a less elaborated account presented by Tzur, as well as of initial observations drawn by Ullmann, has to be further developed in order to explain various aspects in greater detail (such as the difference between *sight* and *sound*). Nevertheless, it may be considered a plausible motivation for Ullmann's findings.

In conclusion, poetic synaesthesia is highly constrained in its compliance to the above generalizations. The constraint involved is a cognitive one, and accounts for the fact that structures conforming to the distinctiveness generalization are judged as more natural, and are better recalled by subjects.

3. Poetic zeugma

Introduction

The figure of speech we analyze in this section is poetic zeugma (from the Greek 'yoking'). Zeugma is

> a figure of speech in which a word stands in the same relation to two other terms, but with a different meaning. Usually a verb modifies two objects. For example: "She caught an aeroplane and a husband" (Cuddon 1975).

Put differently, zeugma can be viewed as a linguistic construction in which one syntactic category, typically a verb or an adjective, governs a catalog of two other syntactic categories (typically nouns), one of which is literally, and the other metaphorically, related to the predicate. Instances of zeugma, as well as of the other figures analyzed here, and perhaps most figures of speech, are to be found both in poetic and non-

poetic language.[3] Here, however, we will focus on poetic zeugma, i.e., the zeugma which prevails inpoetic texts.

The main question to be asked with respect to the structure of this figure is: *Are the components of the zeugma ordered in a principled way?*

Despite the fact that the zeugma structure has attracted the attention of students of literature (see e.g., Arpali 1986, who also provides a survey of various studies of zeugma; Swayne 1941, inter alia), this question has not been addressed in any systematic manner. In fact, this question has not been systematically studied even with respect to individual poets, let alone across poets. Most studies have viewed zeugma as a more general phenomenon to be found at either the local level of the clause or the sentence, or at the more global level of an entire text. Moreover, studies of zeugma have, typically, focused on other aspectsof zeugma than order (see e.g., Arpali 1986). Here, I will focus on the clausal-sentential level.

The critical step of the present analysis is the proposal that an instance of zeugma can be viewed as constituting a *category* (more precisely, an ad hoc category). What allows such a step to take place is the idea that predicates "span" their arguments, thus constituting a "category", the members of which are the arguments. For example, the predicate *is green* spans (among other terms) the term *a flower*, and in this sense the concept "flower" may be viewed as one of several possible members of the category "green entities" (see, e.g., Keil 1981 for a development of that view). Given this assumption, we may surmise that the instance of zeugma's predicates define a category, whose members are the arguments of that predicate. Consider, for example, the zeugma "I packed my shirt and sadness", which consists of a predicate (*shirt* and *sadness*). Under the present view, the predicates *packed* defines the ad hoc category "things one packs", while its arguments, namely, *shirt*, and *sadness* represent the members of that category.

Note, however, that this category is an ad hoc, rather than a "common, stable" one. Let us elaborate on this distinction. A common (taxonomic) category is a hierarchical conceptual structure whose elements are "members" or "instances". For example, the concepts "robin", "crow", "eagle" and "hawk" are categorized as members of the taxonomic common strategy "bird". Typical examples of (common) categories are "vehicle", "fruit", "clothing" and so on. A major property of such common categories, as has convincingly been argued by the modern study of categorization, is that they reflect a *prototype structure* whereby certain members are shown to be more prominent, or prototypical than others: "a robin" is a more prototypical member of the category "bird" than "a chicken", and "a chair" is a more prototypical member of the category "furniture" than "a carpet".

The categories mentioned so far are stable common categories. Recently, however, psychologists have examined less stable, ad hoc categories. Examples of the latter are "things to take on a camping trip" (a category whose members include such items as "a case or box for foodstuffs"), or "things to take away from a burning house" (which includes items such as "jewelry", "valuable documents," and so on) (see Barsalou [1983] for a more detailed discussion of such ad hoc categories). Note, further, that while ad hoc categories differ from common categories in certain respects (such as their lack of the "conceptual stability" typically attributed to the latter), they also share certain characteristics with each other. In particular, it has been observed that ad hoc categories exhibit a prototype structure very much like that exhibited by stable categories. For example, "a case or box for foodstuffs" is a more prototypical member of the ad hoc category "things to take on a camping trip", than, say, "a computer" (see Barsalou 1983).

Given the notion of ad hoc categorization, we may define zeugma as a verbal structure which constitutes an ad hoc category, as previously explained. Note, further, that such ad hoc categories are structured as prototype categories; certain members are considered "more prototypical" than others. For example, "shirt" is a more prototypical member of the category, "things which may be packed" than "sadness" (for an elaboration of this view, see Barsalou 1983, Glucksberg and Keysar 1990, and Shen 1987, 1992a, 1992b).

Given that instances of zeugma represent ad hoc categories whose members are prototypically structured, we may define the issue of "order of presentation" in a more precise manner. The question is simply this: Is the order of presentation of members of such types of "ad hoc categories" constrained in some way beyond a specific context, or is it context dependent?

Basically, if examples of poetic zeugma show no systematic order of presentation then we may assume that the specific context (be it the specific poem, poet, period, etc.) rather than some general principle determines their order. If, however, cases of zeugma are systematically ordered, they could follow one of the following two order types: either the prototypical member(s) is (are) introduced in an initial position, followed by the non-prototypical member(s), or the non-prototypical member(s) is (are) placed first followed by the prototypical member(s). Since I have limited myself to cases of zeugma containing only two members, which differ in their prototypicality, the above options are the only possible ones for such cases.

In order to find out which of these possibilities applies to poetic zeugma, I conducted a textual analysis of a poetic corpus.

3.1. *The selective use of options in poetic zeugma: The textual analysis*

A sample consisting of 350 instances of poetic zeugma was selected, taken from the writings of several modern Hebrew poets. The examples were selected by four independent judges. They were drawn from the corpus of modern Hebrew poetry, covering various phases in the evolution of this corpus over the first eighty years of the twentieth century. As previously explained, the ascribed poetic characteristics of the various constituents of this sample varied substantially.

Like poetic synaesthesia (and unlike poetic simile), zeugma is not very frequently employed in the Hebrew corpus investigated. In particular, the extent to which it was used differed significantly from poet to poet. Some poets make abundant use of it, while others do so only on a very small scale. It therefore proved impossible to implement the methodology used in the analysis of poetic simile. As an alternative, and in order to avoid biasing the corpus analyzed, we collected as many instances of zeugma as we could find from five different corpora. Three such corpora constituted the poems of three representative poets of major periods of modern Hebrew poetry who used zeugma relatively often in their poetry: Alterman from the "Modernist" period, Amichai from the "State-Era" period, and Viseltir, who is associated with the "Era of the eighties". In addition, we collected examples of zeugma that appeared in the poetry of seven additional major poets belonging to various periods of Hebrew poetry, with from two to nine examples collected from the work of each of the poets.

Furthermore, in order to be able to generalize from our data, we extracted a large sample of uses of zeugma from the poetry of an American poet known for his use of zeugma, Alan Ginsburg.[4] By investigating Ginsburg, we have attempted to examine whether any generalizations made regarding the Hebrew corpora would apply equally to a poet working outside the boundaries of Hebrew poetry.

All 350 instances were analyzed as follows. First, two independent judges were given all the examples of zeugma and asked to provide their judgments with respect to the following instruction: "Mark all zeugmas whose members differ with respect to their prototypicality within the ad hoc category represented by the predicate of the zeugmas." As an example, they were given the example cited above: "I packed my shirt and sadness". Only those cases were selected where the two judges claimed that the arguments contained in the examples differed with respect to their prototypicality. This left us with 240 instances of zeugma, which were divided as follows: Alterman—19 instances, Amichai—51, Viesltir—50, the seven Israeli poets—37, and Ginsburg—83.

These 240 cases of zeugma were submitted to two independent judges. They were asked to sort them into two groups: those which consisted of the "prototype first, non-prototype second" order (the "standard" order) and those which consisted of the "non-prototype first, prototype second" order (the "reversed" order). They were given examples for each of these types. Their judgments were compared, and showed a high rate of agreement (approximately 90 percent). Most differences were resolved following a discussion, and agreement was reached in approximately 95 percent of the cases. The very few cases for which no agreement was reached were discarded. (Typical examples of the "standard" and "reversed" orders appear as examples [7] and [8] in the appendix.)

The results are shown in Table 2. About 83 percent of the uses of zeugma conformed to the "prototype first" order, while only 17 percent exhibited the opposite order. As is shown, the pattern is consistent across the five literary corpora that were examined. In particular, it should be emphasized that the variability between corpora was relatively low, ranging between 78 and 84 percent for the "prototype-non prototype" order versus 16 to 22 percent for te inverse order.

For each corpus, the hypothesis that the distribution of the instances of zeugma is random was tested using the binominal distribution. For all five corpora (each of the four poets and the group of seven poets) the results were significant. Thus, the uses of zeugma do exhibit the type of directionality hypothesized above: "standard" instances by far outnumbered "nonstandard" ones. The results are:

Alterman— $p<0.02$
Viseltir— $p<0.001$
Amichai— $p<0.001$
Ginsburg— $p<0.001$
Seven poets— $p<0.002$

Thus, although the sample examined was relatively small, there are some indications that the selective use of poetic zeugma displayed reflects

Table 2. *Overall summary of the "prototype first" vs. "non-prototype first" uses of zeugma, in the five poetic corpora*

	Alterman	Amichai	Viseltir	The seven poets	Ginsburg	mean
prototype first	79%	84%	84%	78%	78%	83%
non-prototype first	21%	16%	16%	22%	22%	17%

a more general tendency which applies to a larger corpus than the one examined. Let me point out that these considerations are similar to the ones previously mentioned with respect to both the figures of simile and synaesthesia.

3.2. *The cognitive account*

Introduction

The next question we pose pertains to the explanatory account, namely: What underlies the preference for the prototype–non-prototype order over its inverse? The account I propose is based on cognitive considerations based on conceptual structure, and, in particular, on the structure of (taxonomic) categories in semantic memory.

Recall that underlying the textual analysis was the view that a case of zeugma constitutes a kind of taxonomic class or *category*, namely, a hierarchical conceptual structure whose elements are "members" or "instances". Thus, for example, "I packed my shirt and sadness" is viewed here as a category—"things one packs"—whose members are a "shirt" and "sadness".

With regard to common categories (such as "fruit", "furniture", "clothing") it has been observed (e.g., Rosch 1978) that the "prototypical–non-prototypical" structure represents a more "basic" one that is more accessible, more easily recalled, and so on, than its inverse. Empirical data obtained by Kelly, Bock and Keil (1986) support this claim. These authors examined the relationships between prototypicality and the structure of sentences in recall, preference ratings, and natural dictionary definitions. Their main finding was that sentences containing category labels (e.g., "fruit") and member labels (e.g., "apple", "lemon"), in which the non-prototypical instances (e.g., "apple") are mentioned before prototypical ones (e.g., "lemon") were systematically changed in recall to place prototypical instances of categories before non-prototypical instances. In a second experiment, it was found that sentences in which the prototype preceded the non-prototype were judged more natural than sentences with the opposite order. A third finding, based on an analysis of dictionary definitions of categories, was that prototypes tended to occur before non-prototypes. The explanation provided by the authors for these findings is framed in terms of the sensitivity of sentence production processes to the lexical or conceptual accessibility of prototypes. It has been proposed that the serial position of prototypical and non-prototypical instances (initial versus non-initial, respectively) reflects their accessibility: instances with higher accessibility (i.e., prototypical ones) are introduced in an initial position, while instances whose accessibility is low are introduced in a non-initial position.

Thus, we may conclude that, with regard to the categories used by Kelly, Bock and Keil in their experiments, the "prototype–non-prototype" order is a more basic one than its inverse in that it reflects a more accessible structure.

Turning back to the case of poetic zeugma, one could argue that Kelly and his collaborators' account may be automatically applied to the observation outlined with regard to the order of components. Recall, however, that zeugma has been defined as constituting an *ad hoc* rather than a stable category (see Barsalou 1983). Hence, one cannot automatically extend the conclusions drawn with regard to common categories by Kelly, Bock and Keil to ad hoc categories as well. Thus, in order to establish that the "prototype–non-prototype" order is more basic and accessible from a cognitive perspective, independent evidence should be submitted. The introduction of such evidence is the main goal of the experiment reported below.

The experiment

Subjects. Thirty-two subjects, undergraduate students in the Faculty of Humanities at Tel Aviv University, participated in the experiment on a voluntary basis.

Materials. Following Kelly, Bock and Keil's recall paradigm (1986), 14 pairs of questions and answers were composed. Each answer consisted of a predicate (a verb or an adjective) and two nouns referring to two members of the predicate (ad hoc) category. One noun was high, and the other low, in terms of its prototypicality for the (ad hoc) category represented by the predicate. A representative example is "The soldier packed his shirt and sadness", in which "shirt" is a more prototypical member of the ad hoc category defined by the predicate ("things one packs") than "sadness". The related question in this case would be: "What did the soldier pack?"

The prototypicality of each noun relative to its corresponding predicate was determined by three independent judges who reached a rate of agreement of 90 percent (most disagreements were resolved through discussion).

Half of the sentences were composed according to the "canonical order", namely, the highly prototypical noun first followed by the less prototypical noun, while the other half consisted of sentences with the inverse order. They were randomly presented to the subjects.

The questions that were paired with the sentences were constructed so that they would serve as cues for recall, without any mention of the category names or any of the nouns.

Procedure. The experiment was run in a classroom. All subjects were told that they were about to participate in an experiment and they were entitled to refuse to do so. The experiment was carried out in two stages. In the first stage, the subjects were asked to read a list of the pairs described above, which were simultaneously read aloud to them by the experimenter. This was done to enhance their recall by giving the subjects both visual and audio exposure to the pairs. The subjects were previously told that they would have to perform a recall task involving these pairs at a later point. After the experimenter had finished reading the list, the questionnaires were collected by the experimenter and the subjects were given blank sheets of paper. Several minutes elapsed before they were actually presented with the recall task. After the intermediate period, the experimenter told the subjects that he was about to read the questions aloud only, and that their task was to provide the answers as accurately as they could on the basis of what they remembered from the previous stage. Then the questions were read aloud by the experimenter one at a time, and the subjects were given ten seconds to write down their answers. After collecting their protocols, the experimenter briefly explained the purpose of the experiment to the subjects.

The general prediction was that the same pattern obtained in Kelly, Block and Keil's experiment would be found. More specifically, our prediction has been that the mean number of sentences which will be inverted in recall will be significantly higher for non-canonical sentences than for canonical ones.

Results. A repeated measures analysis of variance was performed, in order to determine the inversion measure, namely, the number of cases in which the subjects inversed the original order of elements which they had initially read. Our prediction has been confirmed, namely, that the inverse measure for sentences with non-canonical order (mean = 0.594; sd = 0.712) would be significantly higher than for those with canonical order (mean = 0.219; sd = 0.552): $F(1,31) = 5.94$ $p < 0.0208$.

In addition we performed a similar analysis on the recall measure, namely, the number of sentences that were recalled (regardless of whether or not they were inverted in recall). Only sentences in which the two nouns were fully and correctly remembered were counted as recalled sentences. Sentences which were only partly recalled (i.e., those in which none or only one of the nouns was recalled) were not counted.

This analysis yielded no significant difference between the recall of canonical (mean = 2.468; sd = 1.684) versus non-canonical order sentences (mean = 2.468; sd = 1.606): $F(1,31) = 0.00$ $p \geqslant 1$.

These results clearly show that the subjects tended to reverse the order of the two nouns in each sentence when deviation from the canonical order occurred.

Interestingly, recall was not improved significantly as a function of order of presentation of the nouns. Note, however, that in the Kelly, Bock and Keil study, recall measure did not yield an unequivocal result, in that only in one type of the sentences they examined (phrasal conjucts) was a significant difference found in recall, while no such difference was found for declarative sentences (see Kelly et al. 1986). A possible explanation of this result is that two conflicting factors operated in recall: On the one hand, the naturalness of the canonical order increased its recall rate; on the other hand, the less natural order may have caused the subjects to spend more cognitive effort to comprehend those sentences, yielding a better recall for those sentences. The outcome of these conflicting factors may have resulted in a non-significant difference in recall between the two types of sentences.

Discussion. How should we account for this finding? Here, again, I would like to propose that the cognitive constraint previously introduced in (2) may be extended to poetic zeugma as well. Recall that this constraint states that a mapping from more "accessible" concepts onto "less accessible" ones seems more natural and is preferred over the opposite mapping. Put in more general terms, this constraint states that the higher the accessibility of a given concept, the more likely it is to be used as a cognitive reference point (the source of the mapping in the case of similes and synaesthesia) against which the less accessible concept may be perceived as a variant, than vice versa (as convincingly argued by Rosch [1975]).

Applying this notion to the structure of the zeugma we may assume, following Kelly, Bock and Keil's (1986) analysis, that sentence production (and comprehension) is sensitive to the conceptual accessibility of prototypes compared with non-prototypical members. As these authors put it:

> In order to produce sentences fluently, it may be important for these processes to be sensitive to differences in the accessibility of conceptual and lexical information. "Accessibility" in this case means the relative ease with which a concept and its lexical representation can be retrieved and integrated with sentence production mechanisms. (1986: 60).

Given this assumption, and given that prototypical members have greater conceptual and lexical accessibility, Kelly, Bock and Keil conclude that

> ...prototypes should be placed earlier than non-prototypes in the representation of the sentence at the positional level, especially when they both serve the same grammatical role. For example, when a prototype and non-prototype occur in a phrasal conjunct that serves as a direct object of a sentence ... the prototype should tend to appear at the initial slot of the conjunct. (1986: 61).

In sum, then, the assumption is that initial position in a zeugmatic structure should be occupied by the term with the higher accessibility which functions as "a cognitive reference point" for the less accessible term. Such a structure would be more easily comprehended, and more fluently produced, than one exhibiting the reverse order.

We may conclude, then, that the same general cognitive constraint regarding the relations between accessibility and directionality applies to poetic zeugma in addition to poetic similes and synaesthesia.

Summary and conclusion

The present paper has focused on the issue of directionality in poetic figures. Its main thrust has been twofold. First, an attempt was made to isolate a certain (structural) level of (three) poetic figures of speech in which some regularities might be identified, beyond the confines of a specific context (text, poet, school or period). Such regularities were defined in terms of the selective use (namely, systematic preference compared with chance distribution) of certain structural options among the larger set of linguistically and poetically "permissible" options. This selective use, or "preference" for certain structures over others, beyond a specific context, is precisely the object of research of the branch of poetics called "cognitive poetics" (which has recently become a major enterprise in literary theory, see Tzur 1992). The reason for this is grounded in the fact that such selective use cannot otherwise be accounted for, whether in terms of linguistic or "logical" principles (since all the options are equally permissible in terms of their linguistic or logical structure), or in terms of specific contextual principles (since the phenomena we refer to occur beyond any relevant specific context).

The second goal of this paper was to provide a cognitive account for the above selective use. The idea was that, at the level described, the three poetic figures analyzed conform to a basic cognitive constraint. This very notion assumes that poetic structures do conform at some (though, of course, not all) levels to cognitive constraints, rather than linguistic, logical, or contextual ones. The importance of this assumption

is that it defines, in a more precise manner, a central object of research for "cognitive poetics". Under the present view, a major object of research for this branch of poetics is to isolate those levels of poetic phenomena (whether figurative language or other aspects of the literary texts) which exhibit a selective use of options beyond a specific context, and to define the cognitive constraints to which this selective use conforms.

Recently, several researchers have taken such a route in the study of (other) figures. For example, Gibbs and Kearney (1994) have developed a cognitive account of the selective use of the poetic oxymoron, as previously suggested in Shen (1987). Shen's proposal distinguishes between two kinds of structures poetic oxymora may employ, namely, the "direct oxymoron" and the "indirect oxymoron". A "direct oxymoron" consists of two terms which are antonyms, namely, two terms whose only difference consists of a change in the "+/−" sign of their lowest (distinctive) feature, while all their other features are identical. Examples of this structure are "a feminine man", "living death", etc. By contrast, in an "indirect oxymoron", one of the two terms is not the direct antonym of the other, but rather a *hyponym of its antonym*. For example, in "the silence whistles", the second term (*whistle*) is a hyponym of *sound*, which is the "direct" antonym of *silence*. On the basis of an extensive textual analysis, it was argued in Shen (1987) that the use of the "indirect structure" in poetry by far outnumbers that of the "direct structure".

Based on this distinction, Gibbs has argued that psychological findings (e.g., reaction-time experiments) suggest that the "indirect" oxymoron is significantly easier to comprehend than the "direct" type. The importance of this finding is that it suggests, in the spirit of the present paper, that poetry makes a selective use of figures of speech, by clearly preferring "more basic" (e.g., easier to understand) options over less basic ones.

The enterprise of cognitive poetics may contribute substantially both to the theory of the poetic text, and to the theory of the cognitive sciences. With regard to the former, it provides an account of regularities which traditional, contextual, theories fail to explain. Furthermore, it provides a reasonable explanation for the observation that, despite the creativity and novelty manifested in poetic language (which results in its characteristic intricacies and complexities, as literary critics would argue), some semantic aspects of poetic language are rather systematic and constrained. It may very well be the case that it is this adherence to (cognitive) constraints which guarantees the interpretability of poetic language. In other words, these cognitive constraints, while allowing a certain amount of "freedom" for poetic language, guarantee its interpretability by blocking various options.

The implications of the present study with respect to the poetic/non-poetic distinction are also potentially of great interest to cognitive poetics. As already explained in the exposition to this paper, taking the chance level as the standard of comparison for the distribution of figurative structures in poetry implies that one can describe the systematic distribution of such structures in poetry without any reference to whether non-poetic language does, or does not, yield the same pattern. The next natural step in such a project would be the attempt to find out whether the proposed constraints apply equally to non-poetic language.

However, even at this preliminary phase, it would be reasonable to assume, on the basis of patterns found with respect to poetry, that a similar pattern of results (rather than its inverse) would be obtained with respect to non-poetic language, as well. Non-poetic language can either select the same pattern of preference or the opposite one. The latter is highly unlikely, because it implies that non-poetic language consists of structures which are more difficult to comprehend than poetic language. To the best of my knowledge, there is not even a single theoretical, let alone empirical, study which suggests this. Those who argue for such a distinction argue for the possibility that non-poetic language is simpler and easier to comprehend than its poetic counterpart (cf., e.g., the Russian Formalists and several other schools of literary critics). It might, of course, be the case, that the same pattern will emerge for both poetic and non-poetic language, but that it would be stronger for non-poetic language, thus suggesting some differences between the two.

It might well be the case that the tendency exhibited in poetic language is to some extent stronger than the one found in its non-poetic counterpart; nevertheless, the important factor from the standpoint of the present paper is that even in such a case, both poetic and non-poetic language share the same direction, or general pattern. A difference between the strength of the pattern (if indeed it arises from such an examination) is of less importance. In fact, even the figures used in poetry differ among themselves with respect to the number of structures conforming to the above tendency; this does not change the main argument, namely, that the pattern observed clearly prefers the simpler structure over its counterpart.

Furthermore, even if the aforementioned tendency in non-poetic language is indeed found, it will suggest that non-poetic language obeys the same constraints as poetic language. In such a case a strong argument could be made for the general applicability of the underlying cognitive mechanisms described in this paper.

As far as a more general view of cognition is concerned, the proposal offered here may suggest that certain cognitive constraints are general enough to apply both to the "common" usage of language and concepts, as well as to other more creative uses of cognition, such as poetic language. Recently, it has been proposed by various studies within the cognitive sciences (perhaps most forcefully by Gibbs 1994; see also Lakoff & Turner 1989) that figuration, in general, plays a central role in language and thought. Under this view, various "poetic" modes of language and thought, notably metaphor (as well as other non-literal usages of language), constrain, structure and shape many major aspects of our ordinary, common, non-poetic usage of language and thought. The very title of Gibbs' monumental contribution to the study of mind, namely, "The Poetics of Mind", beautifully illustrates this view. Looking at it from the perspective of poetics, the present paper complements this proposal, in that it shows not only that poetic usages of figuration constrain our cognitive system, but that poetic figures are themselves constrained by general cognitive constraints.

Received 31 January 1995
Revision received 21 December 1995

Tel Aviv University

Appendix: Examples of "standard" and "reversed" directionality in three poetic figures (Note: the "reversed" directionality appears in parentheses)

Similes

Abstraction scale

"Standard" directionality: direction of mapping from concrete to abstract.

(1) Emptiness is like a weight, heavy on the heart.
(Weight is like emptiness, heavy on the heart.)
(2) The dream blossoms like a flower.
(The flower blossoms like a dream.)

Salience scale

"Standard" directionality: direction of mapping from salient to non-salient.

(3) The fog is scratching its back like a cat.
(The cat is scratching its back like a fog.)
(4) Her smile warms like a fire.
(Her fire warms like a smile.)

Synaesthesia

"Standard" directionality: the subject represents a "higher", and the modifier a "lower" sense.

(5) A sweet silence.
(A silent sweetness.)
(6) A cold light.
(A lighted coldness.)

Zeugma

"Standard" ordering: the more prototypical argument precedes the less prototypical.

(7) The soldier packed his shirt and sadness.
(The soldier packed his sadness and shirt.)
(8) The baby drank milk and kisses.
(The baby drank kisses and milk.)

Notes

* I would like to thank Roni Bustan, Louise Shabat Bethlehem, Ruth Ronen, Willie van Peer, and two anonymous reviewers for their helpful comments and suggestions on an earlier draft of the paper. Special thanks are due to Arie Verhagen for his invaluable substantial suggestions, and to Roni Bustan for his invaluable assistance in preparing the experiments described in sections 2 and 3.

I would also like to thank Sharon Cherni, Michal Rave, Michal Gilboa, Shifi Techan, Einat Schwarcboim, and Ayelet Gruner, for their valuable assistance in collecting the data for the textual analyses reported in sections 1, 2 and 3.

1. Clearly, there might be some (nontrivial) differences between metaphors and similes (see, e.g., Beardseley 1958); however, such differences do not bear on the following analysis, which focuses on the directionality of the mapping from one concept to another, regardless of the linguistic form which embodies the two concepts. Therefore, the distinction between nominal "metaphors" in the strict sense (namely, expressions of the form "A is B"), and similes (i.e., expressions of the form "A is like B") does not have any bearing on the goals of the present analysis.
2. The choice of closed similes (in contradistinction to "open similes" or metaphors in the strict sense) stemmed from the following two considerations.
(i) As mentioned earlier, the main concern in the present context was to examine directionality in the metaphorical phrase with regard to two parameters: abstraction and salience. This means that in examining each metaphorical phrase it was necessary to determine whether or not both metaphorical terms could be categorized as "concrete" or "abstract," "salient" or "non-salient". Problems potentially arise when the "source concept" or "vehicle" has to be recovered through interpretation. So, for instance, in the metaphorical phrase "green thought" the source concept (e.g., the "plant" to which the thought is compared via the adjective "green") is not explicitly mentioned in the phrase and must be reconstructed. In order to avoid subjective interpretations in determining the "source concept", I preferred to use similes in which both terms of the comparisons are explicit rather than relying solely on interpretation.
(ii) The preference for "closed" rather than "open" similes derives from the need to determine the degree of salience of a given concept (the second generalization regarding directionality). In order to do so, one must relate the concepts in question to some "category" relative to which the former is considered salient or non-salient. The "ground" in the "closed" simile provides such a category label which is not subject to interpretation, unlike the case of the "open" simile.
3. An amusing case in point can be illustrated by an advertisement I recently saw on the signboard of a small restaurant in Zefat (the city of the Kabbalists): "We serve a good meal, wonderful beverages and the coming of the Messiah."
4. One of the reviewers remarked that Ginsburg has a Jewish background. However, Ginsburg is considered, even by students of Hebrew literature, as an American poet whose poetry is more closely related (in terms of language, themes and modes of writings) to American poetry than to Hebrew poetry. So, the common Jewish background should not in any significant way affect the zeugmatic structures exploited in his poetry.

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