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*Art is the Sex of the Imagination: Explaining the Meanings of XYZ Metaphors*

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What does it mean to assert that “Art is the sex of the imagination”? XYZ metaphors, like this, consists of three parts, X (art), Y (sex), and Z (imagination), and express metaphorical meanings that arise from the mappings among three domains, and not two as seen in classic “A is B” metaphors (e.g., “Surgeons are butchers”), and conventional metaphorical expressions (e.g., “Their marriage has gone off course”). Understanding “Art is the sex of the imagination” requires readers to infer how the X, Y, and Z terms interact, or relate to one another, such as recognizing that art and imagination are related, while at the same time understanding how sex stands for some unmentioned quality that is similar to the relationship between art and the imagination. Most generally, XYZ metaphors exhibit the syntax of *NP is NP of NP*, have a semantics of *X is the Y of Z*, and express an analogy of the form *X is to Z as Y is to W*, where *W* refers to an unmentioned term or concept (Hamilton 2005).

Despite the vast experimental research on understanding metaphors, and metaphorical discourse, in psycholinguistics, there have been no studies looking at people’s interpretations of XYZ metaphors. Psycholinguistic studies on metaphor typically demonstrate that the novel features arising from metaphor comprehension are not salient in one’s separate understandings of the topic and vehicle, but emergent properties of some interaction of topic and vehicle

(Utsumi 2005). Our primary interest in the research described in this article focused on whether people understand many of the complex, emergent meanings of XYZ metaphors. Is there any regularity in the meanings different people infer when reading XYZ metaphors? To what degree do people recognize that XYZ metaphors express an implied analogy in which X is to Z as Y is to some unmentioned element W?

Turner (1991) was the first to bring XYZ metaphors to the attention of metaphor scholars within cognitive linguistics. He suggested, in brief, the following hypothesis:

An XYZ metaphor prompts us to understand the conjunction between X and Z metaphorically in terms of a conceptual domain containing Y. In particular, we are to find some W in our conceptual knowledge that stands in a relation to Y which we can refer to conventionally by the expression “Y of W”, and we are to map the relation between Y and W onto the conjunction of X and Z.

Under this proposal, W is not explicitly mentioned but must be metaphorically inferred. People must understand the relationship between art (X) and imagination (Z), and also infer the analogical relationship that sex (Y) has to some concept, such as an activity that is fun, perhaps risqué, and even biologically driven, which in turn leads one to see what art X is to the imagination Z, namely a fun, bodily based activity that can create new products.

Fauconnier and Turner (2002) argued that blending theory offers a descriptive framework for detailing how XYZ metaphors are interpreted through the creation of a conceptual integration network. For example, interpreting “Art is the sex of the imagination” generates a double-scope network in which the inputs have their own organizational frames, as does the blended space. Thus, art and imagination in one input space have an organizing frame that substantially differs from an organizing framework for sex, which is less abstract. As a more concrete entity, sex evokes various images related to both its actions (i.e., sex intercourse) and creative products (i.e., sensual pleasures, children). Even though this XYZ metaphor does not specify how “the sex” is to be interpreted, most readers infer different possibilities for thinking about sex (i.e., the inferred W) as

analogy to the relationship between art and the imagination, all of which emerge from constructing and running the blend, as the interpretation process is characterized in conceptual blending theory. For example, one of our experimental participants wrote an explanation of “Art is the sex of the imagination” that conveys an emergent metaphorical meaning:

Sex is allowing one’s self to be free and run wild. Sex is also satisfying. Art is like sex for the imagination because it lets your mind run wild. You do whatever you want in art. Once you have finished a piece of art you feel a great deal of satisfaction and accomplishment.

Blending theory is often viewed as providing an online account of conceptual processing, and certain aspects of metaphor processing in particular. Yet the theory has not thus far been the basis for much empirical work in psycholinguistics, most likely because it does not offer explicit details about the moment-by-moment processes involved in any act of interpretation, and generally has not provided falsifiable hypotheses that can be experimentally tested.

Our aim in this article is to present some preliminary evidence on people’s interpretations of different XYZ metaphors. This research does not provide an explicit test of blending theory’s claims about XYZ metaphors, although, as will be seen, the data we describe are, to some degree, consistent with the broad outline of Turner’s (1991) original proposal on the meanings people often infer from XYZ metaphors. As Turner (1991) also originally noted, however, there is probably no single point at which any XYZ metaphor is correctly or fully understood. People may have diverse cognitive and aesthetic responses to different XYZ metaphors. But we still expected that people should articulate certain interpretations of these metaphors, specifically showing different aspects of the emergent meanings arising from the complex mappings underlying the implied analogy among the X, Y, Z, and the unmentioned W terms.

We had a group of university students complete two different interpretation tasks. First, these students rated each of 12 XYZ metaphors along five dimensions to assess their relative ease of understanding, explication, and poetic nature. Second, students then

went on to write out their interpretations of the 12 metaphors. Asking people to verbally articulate their understandings of linguistic expressions is not typically viewed within psycholinguistics as an online measure of language comprehension, primarily because the method does not track understanding as it occurs moment-by-moment and involves, to some degree, people's conscious reflections on what they have understood. Indeed, writing down what one understands from reading a metaphor probably enables people to elaborate on what they initially, and quickly, interpreted as they read each word in a metaphor for the first time. Nonetheless, various psycholinguistic experiments have employed a "write down your understanding" method in studies of both text processing and metaphor interpretation (Steen 2007). The verbal protocols produced in these metaphor studies reveal different facets of people's metaphorical thought and linguistic understanding abilities (Gibbs and Boers 2005).

### *Empirical Tasks*

#### Participants and Materials

Eighteen Psychology students from the University of California, Santa Cruz, participated in this study. The 12 metaphors selected as stimuli primarily came from Turner (1991), with several others coming from an analysis of several hundred literary and nonliterary metaphors undertaken by Katz *et al.* (1988). Table 1 presents the list of the 12 metaphors, most of which had literary (e.g., William Shakespeare, Lord Byron, George Sand), philosophical (e.g., Karl Marx, Jesus), or political/scientific (e.g., Otto Von Bismark, John Day) origins.

Table 1 – XYZ Metaphors

Money is the root of all evil.  
Brevity is the soul of wit.  
Politics is the art of the possible.

Religion is the opiate of the masses.  
Art is the sex of the imagination.  
Vanity is the quicksand of reason.  
Cunning is the dwarf of wisdom.  
Children are the riches of poor men.  
Memory is the treasurer of the mind.  
Custom is the guide of the ignorant.  
Maturity is the wreck of happiness.  
Skyscrapers are the giraffes of the city.

### Interpretive Ease and Poetic Qualities of XYZ Metaphors

The first task asked participants to read each XYZ expression and answer the following questions:

1. How familiar is the expression?
2. How easy is it to understand the expression?
3. How easy is it to explain the expressions?
4. How poetic is the expression?
5. How nice does the expression sound?

Participants rated all 12 expressions along these dimensions using a seven-point Likert scale where a rating of one indicates “strongly disagree”, a rating of seven indicates “strongly agree”. Intermediary values were used to indicate that the participant “somewhat agrees” or “somewhat disagrees” with a particular question for a specific metaphor.

Our primary expectations were that people would find some XYZ metaphors easier to understand than others, and that overall participants would perceive the XYZ metaphors as being easier to understand than to explain. Participants may draw certain, even complex, inferences about the X, Y, and Z conceptual mappings without having the ability to explicitly state the mental steps they took to arrive at their conclusions. This pattern should be reflected in higher rating of self-perceived understanding of the phrase and lower ratings of self-perceived ability to explain the phrase.

Mean ratings for each metaphor are listed in Table 2. Not surprisingly, participants rated the metaphors differently. For familiar-

ity, “Money is the root of all evil” was rated as most familiar (6.89) and “Brevity is the soul of wit” was rated as least familiar (2.39). In the ratings of comprehensibility, “Skyscrapers are the giraffes of the city” was rated as being the easiest to understand (6.83) while “Brevity is the soul of wit” was judged to be more difficult to understand (3.28). Ratings of perceived ease of explanation showed a similar trend as ratings of comprehension, with “Skyscrapers are the giraffes of the city” rated as the easiest to explain (6.78) and “Brevity is the soul of wit” rated as the least easy to explain (2.83). For poetic quality, participants judged “Vanity is the quicksand of reason” was rated as the most poetic (5.56) and “Politics is the art of the possible” was rated as the least poetic (3.94). Lastly, participants rated phrases according to whether or not they sounded nice, rating “Memory is the treasurer of the mind” as sounding the nicest (5.50) and rating “Money is the root of all evil” as sounding the least nice (3.72).

Table 2 – Mean Ratings

<i>Phrase</i>	<i>Familiar</i>	<i>Understand</i>	<i>Explain</i>	<i>Poetic</i>	<i>Sound</i>
Skyscrapers are the giraffes of the city	3.50	6.83	6.78	4.28	4.72
Maturity is the wreck of happiness	3.22	5.26	4.94	4.89	4.17
Custom is the guide of the ignorant	2.39	4.33	4.06	4.39	4.00
Memory is the treasurer of the mind	4.11	5.83	5.22	5.39	5.50
Children are the riches of poor men	3.89	6.28	5.50	5.22	5.22
Cunning is the dwarf of wisdom	2.83	4.22	3.56	4.83	4.61
Vanity is the quicksand of reason	3.61	4.44	4.00	5.56	5.17
Art is the sex of the imagination	3.72	5.50	5.17	4.83	4.11
Religion is the opiate of the masses	4.72	4.78	4.67	4.67	4.78
Politics is the art of the possible	3.11	4.50	4.00	3.94	4.56
Brevity is the soul of wit	2.67	3.28	2.83	5.22	4.78
Money is the root of all evil	6.89	6.61	6.11	4.67	3.72

These varying differences in people's impressions of XYZ metaphors, at the very least, suggest the need for a complex approach when explaining how these expressions are understood. As is the case with research on people's understanding and appreciation of classic "A is B" metaphors (cf. Katz *et al.* 1988), the processes and products involved in interpreting XYZ metaphors likely differ depending upon the familiarity and poetic quality of each phrase. More generally, we were interested in whether participants viewed the XYZ metaphors as being easier to understand than to explain. Indeed, people rated the metaphors are being significantly easier to understand (5.16) than to explain (4.74),  $t(215) = 5.95$ ,  $p < .001$ , a finding that is consistent with the general observation that people may be able to grasp some aspects of the meanings of metaphors without necessarily being able to verbally explicate these understandings.

#### Explaining XYZ Metaphorical Meaning

The second task asked people to write out their interpretations for the 12 metaphors. Our general expectation was that participants would be able to understand, to varying degrees, most of the XYZ phrases and explain some aspects of their interpretations explicitly in terms of different X, Y, and Z relationships. We first predicted that participants would provide fuller definitions for the X and Y terms than they would the Z terms, precisely because of the importance of X as the focus or target of the metaphor. Moreover, people could only be capable of explaining part of an XYZ metaphor, and may, for instance, describe the relationship between X and Y (e.g., how art and sex are related), without making an explicit connection to the Z term, or offering an implicit W term in their explanation. Given the importance of Y for understanding the full metaphor, we expected that people would take some effort to explicate the metaphoric meanings of Y.

We also expected that participants would offer interpretations that suggest their understanding of emergent metaphoric meanings. Thus, people should explain the meanings of X and Y, specifically, in metaphoric relation to one another, more so than would their

non-metaphoric common features be noted. Participants may additionally attempt to interpret the metaphors in terms of the underlying analogy, even if they do not spell out the implied analogy (i.e., X is to Y as Z is to W) in full detail.

Finally, we predicted that participants would include various personal, social, and cultural elements into their explanations of the metaphors. Because these metaphors were not given in context and the complex conceptual mappings may be difficult to articulate, people may draw on their social, cultural, and personal knowledge to further explain the meanings of these metaphors. Furthermore, a participant's personal, cultural and social perspectives about a topic may affect the way they express their ideas about the topic.

Participants' explanations of the different metaphors in the open-ended interpretive task varied considerably, and contained a tremendous amount of information. We approached these data with the aim of trying to systematically capture all of what people stated. After close examination of the participants' protocols, we created a coding scheme from the bottom up that described the mappings that people appeared to draw among the X, Y, and Z terms, as well as their inferences about the missing W terms, and the analogies implied by the different metaphors. We also found that people offered a variety of other interpretations, some of which expressed their extended, often personal, responses to the metaphors. Overall, we ended up with a coding scheme that included 23 different categories. These categories reflected different parts of participants' interpretations that were not necessarily mutually exclusive, because some individual protocols contained elements that reflected more than one category of response. At the very least, though, the following coding scheme reflected much of the rich set of complex mappings and individual responses participants wrote out for the 12 XYZ metaphors.

Presented below is the list of 23 interpretive categories, along with brief definitions for each category, and examples of what some participants wrote that were coded as belonging to each category. We present these in a crude order starting with some of the simple interpretations offered, referring to people's definitions of the differ-



ent X, Y, and Z terms, to more complex mappings among the three elements, then to higher order emergent meaning, followed by more idiosyncratic, and usually extended, interpretations. Each category listed below also shows the proportion of times, across all participants and stimulus items, that the interpretations were coded as belonging to that specific category. For ease of overall reading, Table 3 presents a simple list of the 23 categories and the proportion of responses relevant to each one.

Table 3 – Results of Interpretive Task

	Response Category	Percentage of Response
1.	<i>Non-Metaphoric Definition of X</i>	(19%)
2.	<i>Non-Metaphoric Definition of Y</i>	(14%)
3.	<i>Non-Metaphoric Definition of Z</i>	(7%)
4.	<i>X Described in Terms of Y</i>	(43%)
5.	<i>X Described in Terms of Z</i>	(22%)
6.	<i>Y Described in Terms of X</i>	(1%)
7.	<i>Y Described in Terms of Z</i>	(2%)
8.	<i>Z Described in Terms of X</i>	(10%)
9.	<i>Z Described in Terms of Y</i>	(12%)
10.	<i>Features in Common between X and Y</i>	(16%)
11.	<i>Features in Common between X and Z</i>	(0%)
12.	<i>Features in Common between Y and Z</i>	(1%)
13.	<i>Contrast Between One Term with Another</i>	(29%)
14.	<i>Explanation of Metaphoric Meaning of Y</i>	(51%)
15.	<i>XYZ Paraphrase With Non-Metaphoric Y</i>	(15%)
16.	<i>Term Labeled as Metaphoric or Figurative</i>	(15%)
17.	<i>Underlying Full Analogy Stated</i>	(13%)
18.	<i>Explicit Mention of W</i>	(19%)
19.	<i>The Linking Relationship in the Analogy</i>	(63%)
20.	<i>Social, Cultural, or Personal Explanation</i>	(63%)
21.	<i>Personification</i>	(22%)
22.	<i>Term Misunderstood</i>	(9%)
23.	<i>No Response</i>	(1%)

**1. Non-Metaphoric Definition of X** (19%)

A description of the X term in a non-figurative way, independent of the other terms in the phrase.

Example: “Vanity is the quicksand of reason”

Relevant participant responses:

“Vanity = superficial”

“Vanity = obsessive love of one’s self”.

**2. *Non-Metaphoric Definition of Y*** (14%)

A description of the Y term in a non-figurative way, independent of the other terms in the phrase.

Example: “Vanity is the quicksand of reason”

Relevant participant responses:

“Quicksand will pull you in and kill you”.

**3. *Non-Definition of Z*** (7%)

A description of the Z term in a non-figurative way, independent of the other terms in the phrase.

Example: “Vanity is the quicksand of reason”

Relevant participant responses:

“Reason or logic”

“No reason, no long contemplated thought”.

**4. *X Described in Terms of Y*** (43%)

Figurative definition of X is described in terms of a relationship to Y.

Example: “Vanity is the quicksand of reason”

Relevant participant responses:

“Vanity is what causes the quicksand. It is the creator of quicksand in the first place”.

**5. *X Described in Terms of Z*** (22%)

Figurative definition of X is described in terms of a relationship to Z.

Example: “Maturity is the wreck of happiness”

Relevant participant responses:

“When one becomes mature, all fun and games (happiness) goes out of the window. It ruins happiness”.

**6. *Y Described in Terms of X*** (1%)

Figurative definition of Y is described in terms of a relationship to X.

Example: "Vanity is the quicksand of reason"

Relevant participant responses:

"Quicksand is the metaphor for the trap reason falls into/eventually disappears into, once vanity comes into play".

Example: "Art is the sex of the imagination"

Relevant participant responses:

"Sex can be defined as art".

**7. *Y Described in Terms of Z*** (2%)

Figurative definition of Y is described in terms of a relationship to Z.

Example: "Art is the sex of the imagination"

Relevant participant responses:

"When we let our imaginations wander off, I guess that is when we reach that certain climax of thought as in sex".

"To get a heightened sense of emotion and impulses the imagination must be stimulated through art because the creativity that goes in is like an orgasm in your brain".

**8. *Z Described in Terms of X*** (10%)

Figurative definition of Z is described in terms of a relationship to X.

Example: "Brevity is the soul of wit"

Relevant participant response:

"Brevity is what makes the characteristics of wit the definition of wit".

Example: "Children are the riches of poor men"

Relevant participant response:

"Poor men may have nothing but if they have children they are among the richest".

**9. *Z Described in Terms of Y*** (12%)

Figurative definition of Z is described in terms of a relationship to Y.

Example: “Vanity is the quicksand of reason”

Relevant participant response:

“Reason is like a jungle and if you don’t have a map any shortcut leads to quicksand”.

#### *10. Features in Common between X and Y* (16%)

Common, non-figurative features shared by X and Y outside the context of the metaphor.

Example: “Skyscrapers are the giraffes of the city”

Relevant participant response:

“Since skyscrapers stand above all the other buildings in a city, they are like giraffes – they are noticeable, tall, and stand above all else”.

Example: “Religion is the opiate of the masses”

Relevant participant response:

“This phrase is saying that religions are like opiates. It provides comfort to a large number of people. But since opiates are a drug this statement is comparing mass religion to mass drug addiction. So this statement is saying that religions are giving a false sense of comfort”.

#### *11. Features in Common between X and Z* (0%)

Common, non-figurative features shared by X and Z outside the context of the metaphor.

#### *12. Features in Common between Y and Z* (1%)

Common, non-figurative features shared by Y and Z outside the context of the metaphor.

Example: “Art is the sex of the imagination”

Relevant participant response:

“If imagination were to reproduce, the mess of an outcome trying to portray and define every detail of imagination would be art at its core: messy, vibrant, and always different”.

#### *13. Contrast Between One Term with Another* (29%)

Instead of comparing features two terms have in common, the participant describes what is different about the terms or what happens if one of the terms is removed from the equation.

Example: “Children are the riches of poor men”

Relevant participant response:

“Poor men do not have money nor luxuries to scoundrel over”.

Example: “Religion is the opiate of the masses”

Relevant participant response:

“Religion is like a drug. It makes millions happy and hopeful. People go back for more every week for a little fix. Atheism is the anti-drug of choice”.

*14. Explanation of Metaphoric Meaning of Y* (51%)

The Y term is explained by mentioning entailments that are appropriate for this specific instantiation of the source domain, often creating further imagery by which the phrase can be more fully explained.

Example: “Vanity is the quicksand of reason”

Relevant participant response:

“Vanity inhibits reason. It drowns reason and kills it. Vanity ruins reason...”.

*15. XYZ Paraphrase Where Some Other Non-Metaphoric Phrase is Used for Y* (15%)

A paraphrase for the entire XYZ metaphor where the Y term is replaced by a non-metaphoric term.

Example: “Vanity is the quicksand of reason”

Relevant participant response:

“Vanity has an effect on reason”.

*16. Term Labeled as Metaphoric or Figurative* (15%)

Stating that the entire phrase or relationship between terms was “figurative”, an “analogy”, or by saying that one term “stood for”, was “like”, or was “equal” to another term.

Example: “Vanity is the quicksand of reason”.

Relevant participant response:

“Quicksand is the metaphor for the trap reason fall into/eventually disappears into, once vanity comes into play”.

**17. Underlying Analogy Stated in Full** (13%)

The underlying analogy for the XYZ metaphor is fully stated, noting that X's relationship to Z is parallel to Y's relationship to W.

Example: "Vanity is the quicksand of reason"

Relevant participant responses:

"Vanity traps reason as quicksand would trap a creature".

"Vanity will kill reason the same way quicksand will pull you in and kill you".

Example: "Skyscrapers are the giraffes of the city"

Relevant participant response:

"Giraffes are the tallest things in the savannah, while skyscrapers are the tallest things in a city".

**18. Explicit Mention of W** (19%)

The presumed W term is explicitly mentioned, but not necessarily within the context of the entire metaphor.

Example: "Skyscrapers are the giraffes of the city"

Relevant participant response:

"The Savannah" (as in Skyscrapers are to the city as giraffes are to the savannah).

Example: "Politics is the art of the possible"

Relevant participant response:

"Since art is a form of expression and usually requires a lot of imagination, saying that politics is the art of the possible is putting politics into that same category".

**19. The Linking Relationship in the Analogy** (63%)

The specific relationship that is shared by X and Z and Y and W is explicitly stated.

Example: "Vanity is the quicksand of reason"

Relevant participant response:

"Vanity inhibits reason. It drowns reason and kills it. Vanity ruins reason. Quicksand is the obstacle".

**20. Social, Cultural, or Personal Explanation** (63%)

A personal, social, cultural, historical, or philosophical anecdote to

contextualize an interpretation of the metaphor.

Example: “Vanity is the quicksand of reason”

Relevant participant response:

“Stating that often pride gets in the way of reason: Once you allow your pride to interfere with your life, all your reason sinks away in the sand. For example, someone challenges you to a race; you know you’ll lose, but you do it anyway because he called you ‘chicken’”.

**21. Personification** (22%)

Attributing human or animal qualities to inanimate objects or abstract concepts.

Example: “Vanity is the quicksand of reason”

Relevant participant response:

“To fly on the wings of vanity and wax is to fall to your end. It has a way of sneaking up on you. One second you’re on solid ground, the next in quicksand sinking alongside the newly befriended vanity”.

**22. Term Misunderstood or Not Understood** (9%)

Example: “Brevity is the soul of wit”

Relevant participant response:

“I don’t know an exact definition for ‘brevity’ and I don’t know what ‘wit’ is”.

**23. No Response** (1%)

No response given.

*Discussion*

This list of interpretive responses to the XYZ metaphors is obviously complicated, but it again properly describes some of the richness in people’s experiences when reading these complex metaphoric phrases. There are several broad conclusions that can be drawn from these data.

First, people exhibit a stronger tendency to think of the main

topic X in metaphoric ways, especially in relation to Y (43%) and Z (22%), which together is far greater than the frequency with which they defined X in non-metaphoric terms (19%). The Y term is also thought of metaphorically, given participants' very frequent, elaborate descriptions of Y's metaphoric meanings (51%). Thus, as participants explained X in terms of the critical Y term, they clearly perceived the metaphorical relationship between X and Y, and saw this as central to what the XYZ metaphors meant. There are occasions, however, when noting the non-metaphoric commonalities between terms is most appropriate, especially when people interpret particular metaphors like "Skyscrapers are giraffes of the city" where the non-metaphoric attributes of "tall" and "standing above all else" are most prominent.

People did not frequently state the unmentioned W term alone (17%), nor did they often explain the full analogy that underlies the meanings of the XYZ metaphors (13%). Yet participants frequently described the linking relationship in the underlying analogy (69%), suggesting that what these metaphors meant centered on how X and Z related to the relationship between Y and W. In this way, even if the W term is not explicitly mentioned, people appear to recognize that some other concept is being implied by the entire metaphor, which is necessary to infer in order to interpret what these complex metaphorical expressions communicate.

One interesting result was people's frequent attempts to describe the meanings of different terms through some contrast with other terms (29%). In this case, people are not fixating only the metaphoric similarities between the X, Y, and Z terms, but dissimilarities. Of course, metaphoric meanings of classic "A is B" metaphors (e.g. "Man is wolf") have long been thought to include complex patterns of both similar and dissimilar interactions of the topic and vehicle terms (Black 1979). Yet the role that dissimilarities play in metaphor comprehension has not been of great theoretical or empirical focus in recent years. The frequent number of dissimilarities noted between the X, Y, and Z terms may have arisen during people's immediate comprehension of the metaphors. However, we suspect that noting dissimilarities between the various terms in XYZ metaphors



may come about specifically because participants found it difficult to verbally explicate the meanings of these metaphors and so adopted a strategy of highlighting dissimilarities to better communicate their emergent understandings.

Personification was also a figurative strategy that people use more frequently than we anticipated (22%), especially with some of the XYZ metaphors. Conceiving of an abstract concept like “vanity” as something with human traits, and as something that can “sneak up on you”, and thus hinder one’s reasoning powers, makes perfect sense in the context of the entire expression “Vanity is the quicksand of reason”. In fact, the personification of “vanity” may be part of the original motivation for how the metaphor “Vanity is the quicksand of reason” came into being, and not just a rhetorical device that participants used to explain their interpretations of its meaning. Participants also explicitly mentioned on some occasions (15%) that the phrases they were explaining had “metaphoric” meaning, were “analogies”, or “stood for” other ideas and concepts. We assume here that people’s inclusion of these labels reflected their attempts to explicate the emergent, often vague, understandings of the different mappings inferred from reading the metaphors, and to clarify participants’ own vague interpretations of what these phrases meant.

There were on average about 10% of responses that signaled participants’ failure to understand parts of the XYZ metaphors, usually because they did not know the meaning of isolated, usually abstract, terms, such as “cunning” or “brevity”. At one level, this finding suggests that people were able to offer some meaningful interpretations of the metaphors 90% of the time, a fact showing a high degree of competence, among college students anyway, in ordinary understanding of these XYZ metaphors.

One of the most frequent interpretive devices that people employed to better explicate the meanings of the XYZ metaphors is their knowledge of social, cultural, and personal experience. We are not sure if people always draw upon such idiosyncratic knowledge when they hear or read XYZ metaphors in context. But at the very least, people clearly find it useful to further explain their abstract metaphoric interpretations of these isolated metaphors through ap-

peal to their personal, cultural and social perspectives about a topic. Similar kinds of personal associations to abstract metaphoric meanings are also widely seen when people are asked to verbally explain the meanings of isolated proverbial expressions, such as “Don’t count your eggs before they are hatched” (Gibbs and Beitel 1995).

Overall, people used a variety of strategies to describe their understandings of the XYZ metaphors. Not surprisingly, there was a great deal of variation across different participants’ responses, and variation in the general responses given to different XYZ metaphors. The variation in responses to different metaphors makes it challenging to create any theory to account for all these data. Consider, for example, three different metaphors from our study:

“Skyscrapers are the giraffes of the city”  
 “Religion is the opiate of the masses”  
 “Vanity is the quicksand of reason”

As the metaphors progress from the top to the bottom of the list, one can notice that the conceptual relationships become more abstract, more conceptually complex, more difficult to understand out of context, and perhaps more poetic. Although it is generally very easy to compare giraffes and skyscrapers, noting that they are both quite similar in height, it is not very revealing to most speakers of English in the US who are probably already aware of the tall nature of skyscrapers and giraffes and do not need to understand one concept (giraffes) to understand the other (skyscrapers). Thus the metaphor is bi-directional and does not rely on any complex conceptual analysis. “Religion is the opiate of the masses” appears to be more complex conceptually, where one understands the abstract concept of religion temporarily through the embodied effects of drug use and abuse. This metaphor, as well as “skyscrapers are the giraffes of the city”, can both be understood through the systematic conversion of the expression to an analogy in which X, Y, and Z are given and W is not mentioned but strongly implied and understood so that X is to Z as Y is to W. But interpreting “Vanity is the quicksand of reason” is even more challenging, and demands that one infer the conceptual metaphor MENTAL ACTIVITIES ARE JOURNEYS

to realize that quicksand can impede a journey and, by extension, impede ongoing mental activities, such as reason.

These observations about different XYZ metaphors are supported by some specific trends in the data from our first task. As the relationships increase in complexity from “Skyscrapers are the giraffes of the city”, to “Religion is the opiate of the masses” and finally, “Vanity is the quicksand of reason”, there are progressive trends in the ratings of the metaphors with the least complex being rated as being the easiest to understand, respectively (Mean Ratings: 6.83, 4.78, 4.44) and easier to potentially explain (6.78, 4.67, 4.00) as well as showing an opposite trend for being highly poetic (4.28, 4.67, 5.56) and sounding nice (4.72, 4.78, 5.17). This supports the notion that participants were sensitive to the increasing conceptual complexity and rated the metaphors accordingly as being less easy to understand and interpret as well as increasing in poetic effects.

People’s performance in the open-ended interpretive task also showed sensitivity to this increasing conceptual complexity among different XYZ metaphors. As complexity among the three metaphors discussed here increased, participants were more likely to describe X in terms of Y (17%, 44%, 50%), describe X in terms of Z (6%, 11%, 17%), to paraphrase the metaphor (6%, 22%, 28%), to use social or cultural knowledge (28%, 67%, 67%), and use personification (11%, 11%, 39%). Other trends showed that as complexity increased participants were less likely to define Y in non-metaphoric ways (50%, 39%, 6%), to label the relationship as being figurative (39%, 22%, 0%), to come up with the entire analogy (44%, 11%, 11%), and to explain the common features between X and Y (83%, 28%, 11%). These analyses reflect some of the systematic variation that underlies people’s responses to different XYZ metaphors, and more generally provide distinct challenges for creating a single, comprehensive theory of XYZ metaphor interpretation.

### *Conclusions*

Our studies demonstrate the various ways that people are able to

interpret and explain XYZ metaphors. There are several theoretical perspectives that can explain varying aspects of our data. Conceptual blending theory offers a deep, descriptive framework for describing many of the mappings that people may need to draw to infer complex XYZ metaphorical meanings. For example, people's explicit attempts to not just individually define the X, Y, and Z terms, but to interpret X in relation to Y, and to a lesser extent X in relation to Z, may reflect different input spaces contributing to the overall blend. At the same time, the tendencies to report metaphoric explanations of Y, and the linking relationship in the underlying analogy, may reflect the creation of an emergent blended space. Conceptual metaphor theory would suggest that the interpretations of XYZ metaphors are to some degree constrained by recruitment of relevant conceptual metaphors, such as access of MENTAL ACTIVITIES ARE JOURNEYS being relevant to the interpretation of "Vanity is the quicksand of reason". A different theoretical perspective, namely relevance theory, would suggest that the emergent properties of these XYZ metaphors arise, not from cross-domain mappings, but from ordinary inferential mechanisms that increase access of relevant contextual information and implicatures. Thus, the inclusion of the third term in XYZ metaphors may increase the cognitive effort needed to interpret these metaphors, yet provide a wider range of weak implicatures or poetic effects. The added aesthetic value from the Z may also make the message more memorable to the audience, leading them to further contemplate the meanings of XYZ metaphor and making it more likely that these phrases will be quoted in future discourse.

Psychologists disagree about the cognitive mechanisms involved in feature emergence during metaphor understanding. But the two main proposals in psycholinguistics on emergent metaphorical meaning have something to offer in explaining XYZ metaphor interpretation. A comparison view suggests that people begin processing a metaphor by first aligning the representations of the source and target domain concepts (Gentner *et al.* 2001). Once these two domains are aligned, further inferences are directionally projected from the source to the target domain. Finally, new inferences arise within

the target domain reflecting relational, and not just feature-specific, aspects of the metaphor comprehension processes. These ideas can be extended to three domains by assuming that alignment of X and Y, X and Z, and Y and Z begins first and that relational meanings are then inferred once mappings are directly projected from each domain onto another. An alternative view claims that metaphors are better understood via categorization processes as class-inclusion, and not comparison statements (Glucksberg 2001). Under this view, metaphoric meanings arise from creating ad hoc categorizations in which the complex mappings between the X, Y, and Z terms, in conjunction with inferences about W, form an ad hoc category, where W stands for a best exemplar of the new category.

Finally, some psychologists suggest that language, of any sort, is processed to the degree that the meaning products inferred are just “good enough” for the purposes at hand (Ferreira *et al.* 2002). In some cases, people may draw elaborate meanings and inference patterns from metaphors, for example, and in others the meanings understood may just be rather crude, sketchy, or incomplete. One advantage of this perspective is that it accounts for occasions where individuals create simplistic interpretations of XYZ metaphors, such as when a participant stated when explaining “Money is the root of all evil” that “Money is bad”.

Each of these different theoretical proposals explains different aspects of what people infer, along different dimensions under different conditions, when reading XYZ metaphors. We see no reason at present to adjudicate between these theories as to which one is superior for explaining much of the open-ended interpretive data described above. Yet it seems clear that any future theoretical proposals on XYZ metaphors must deal with the complexity of people’s interpretations, and not simply assume that all XYZ metaphor express the same type of meaning at the same level of detail.

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