

Towards a Revised Theory of Visual Signification

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1 Introduction

Technology has made it much easier to produce, use, and share visual content, so that communication has become increasingly visual-centric (McQuarrie and Phillips 2008). Visuals in commercial communication are also becoming more imaginative and complex than in the past (Phillips and McQuarrie 2002; Scott 1994). Visuals seem to assume an increasingly visually sophisticated individual who reads images like any other type of text. Images are being actively interpreted and do not merely copy some external reality (McQuarrie and Mick 1999; Scott 1994). But, what are the underlying cognitive mechanisms that govern individuals' interpretation of images? It seems that our theories still do not offer a full understanding or explanation of what it means to interpret an image.

Our paper has three goals. First, we examine the current debates in visual theory discourse about how images work in visual communication. From here, we propose a conceptual framework that disentangles visual signification based on Peirce's (1931-58) theory of signs. The proposed conceptual framework delineates the relations formed by the three basic elements of the sign system: the sign, the object, and the interpretant. Finally, in order to understand how individuals interpret visual imagery, we re-conceptualize the idea of literal and symbolic interpretation as a continuum ranging from no reclassification of objects to reclassification of semantically distant objects. Essentially, we lay the building blocks for a new theory of visual communication and interpretation that is based on categorization. That is, how individuals identify and categorize objects in the real world (Rosch et al. 1976).

2 Literature Review

A key debate in visual rhetoric theory revolves around the issue whether images signify through resemblance-based or convention-based associations. Implicit in past views of how visual images work in advertising was the assumption that pictures merely reflect reality (Scott 1994). Despite the intuitive appeal of the proposition that pictures copy reality, a number of eminent scholars have identified several limitations to this assumption (McQuarrie and Mick 1999; Mick and Buhl 1992; Mick and Politi 1989; Scott 1994). A key limitation is that past views failed to account for the richness of visual meaning

(Scott 1994). Research within text-interpretive and reader response approaches (Durand 1987; McQuarrie 1989; Scott 1994; Stern 1989; Mick and Buhl 1992; Mick and Politi 1989) paved the way for appreciating the complexity of visual meaning. This stream of research, however, only partly specified the causal relationships between visuals and consumers' responses (McQuarrie and Mick 1999).

Studies within a visual rhetoric context systematically tried to fill this gap (McQuarrie and Mick 1999). These studies paid closer attention to the image and articulated an alternative view to the assumption that pictures merely copy reality. In its more radical form, visual rhetoric suggested that visuals form a symbolic language that, like verbal language, ultimately forms a convention-based system (Scott 1994). Theories of visual rhetoric disentangled the various forms and styles found in visuals by introducing a new linguistic way of seeing visuals -for example, as metaphors (McQuarrie and Mick 1999; Phillips and McQuarrie 2002; Scott 1994). Although the level of specification regarding the identification of formal visual properties and their link to consumers' responses varied in studies of visual rhetoric, this stream of research effectively demonstrated that visuals might be as capable of communicating complex information about products as verbal language. Although understanding visuals to be complex messages in their own right was a great advance in the status of pictures in the literature, many researchers have noted that little progress has been made in developing a better understanding of how visual persuasion works (Garber and Hyatt 2003; Larsen 2008; Malkewitz, Wright, and Friestad 2003).

The terminology and the theoretical framework introduced by the visual rhetoric tradition underpinned many recent efforts to understand visual communication. However, more recent research has tended to move away from this tradition and its associated debates concerning resemblance and representational correspondence, seeing these issues as distracting attention from more central theoretical concerns (Pracejus, Olsen, and O'Guinn 2006). For example, some researchers recognized that despite the pervasive role of symbolic meanings in visual communication, such as in art (Hagtvedt and Patrick 2008), symbolic meanings do not subtract from the representational value of images (Hagtvedt and Patrick 2011). That is, their ability to signify out of resemblance. These later studies broadened the scope of visual research by showing, for example, how individuals derive meaning from the history of the use of visual objects (Pracejus et al. 2006). Similarly, recent studies highlighted the role of prior exposure to semantically and perceptually-related stimuli to the encoding of visuals by individuals (Labroo, Dhar, and Schwarz 2008; Labroo and Lee 2006; Lee and Labroo 2004) and stressed the role of consumers' interaction with visuals (Jiang et al. 2014; Phillips and McQuarrie 2010).

In a similar fashion, studies within embodied cognition and spatial metaphor (Barsalou 2008; Lakoff and Johnson 1980) further suggested that ostensibly unrelated factors might influence the interpretation of images. For example, a group's position on the vertical axis influences its perceived powerfulness (Schubert 2005). Powerful groups are more quickly and more accurately identified as being powerful when they appear at the top of a screen, above powerless groups, rather than below powerless groups (see also Giessner and Schubert 2007). Similarly, strangers were rated as being closer to God when their images appeared in higher rather than in lower vertical positions (Meier et al. 2007).

3 Conceptual Framework

The present paper articulates a framework as a way to understand how images work in visual communication. Our theoretical framework draws from Peirce's (1931-58) account of signification as a starting point for disentangling and analyzing the dichotomies and debates found in current theories of visual representation. Peirce understood the sign as a system consisting of three inter-related elements: the sign, the object, and the interpretant. A sign, as an element of the sign system, might be thought of as a vehicle. For example, an image of a table or the word "table" signifies its respective object. For Peirce, however, the object-sign relation forms only a part of the sign system. It can only be understood via the interpretant. In simple terms, the interpretant is what gives meaning to the object-sign relation. Peirce further classified the sign-as-a-vehicle element into three major types: icons, symbols, and indexes. An icon signifies its object by sensuously resembling it such as in photographs. Symbols signify their objects out of conventions or set rules such as in the case of written words. Indexes signify their objects by means of a causal connection to them. For example, smoke might be seen as signifying fire.

We develop our theoretical framework of visual representation by analyzing the relations formed between signs, objects, and interpretants. These otherwise interconnected relations are separated only for the purpose of systematically investigating their relevance to the current debates in visual theory. We believe that many of the debates that have plagued visual theory development stem from the lack of consideration of the relations between these elements. Further, such an analysis might also help identify areas that are in need of further theoretical and empirical investigation. Finally, the proposed framework might ultimately help in developing a more complete account of visual communication. First, we discuss the object-sign relation, which has been inextricably linked to the issues of resemblance and representativeness in visual theory discourse. Next, we discuss the sign-interpretant relationship in terms of the signs' function to point

to objects. Lastly, we analyze one of the most neglected relations -that between interpretant and object.

3.1 The Object-Sign Relation

Visual rhetoric discourse has devoted a lot of attention to the object-sign relation. Implicit in this debate was the underlying premise that the object-sign relation alone reflects the nature of representation in general. Part of the discussion about the way images represent was framed as a question of whether pictures copy reality (i.e., their objects) or individuals actually learn to identify associations between visual signs and objects (Scott 1994). In broader terms, whether images signify out of resemblance or do they function as a symbolic system of representation? Issues such as of representational correspondence and pictorial resemblance prevailed in theory development (Pracejus et al. 2006). The argument that individuals learn how to associate a visual sign to its object directly questions the importance of resemblance-based inferences in visual communication. It is mainly symbols such as written words that require learning in order to function as vehicles for objects. If images are unable to function as representation-bearers in their own right (Peirce 1931-58), it impoverishes the role of iconic associations in Peirce's theory of signs.

Three main arguments against resemblance in visual communication can be identified in the literature. The first argument is based on the observation that some images are so imaginative that they simply do not resemble reality (Scott 1994). The second argument posits that stylistic elements such as the point of view from which an object is depicted can always be interpreted in symbolic terms and therefore icons never simply resemble their objects (Scott 1994). The third argument against resemblance states that resemblance is a general function that cannot alone be used to indicate that something stands for something else - that is, resemblance cannot establish a representational function in the first place (Goodman 1976). We discuss each of the arguments against resemblance in order to reestablish the importance of resemblance-based inferences and better position iconic associations in a revised theory of visual communication.

3.1.1 Imaginative Images

Scott (1994) justifiably argues that some advertising images are so imaginative that it is difficult to think of real objects that correspond to these images. Scott (1994) characteristically observes that some images are so untypical of real situations that they cannot be found anywhere in real life. The reader of these images should employ symbolic thinking to understand the

communicator's intention. Scott (1994) offers the example of a Clinique ad that shows an unusual image of a mascara and a lipstick placed into a glass of soda water signifying the product's refreshing or waterproof properties. Undoubtedly, it is difficult to think of a real situation with such a setting of objects.

The argument of Scott (1994) that some images are so imaginative that they simply do not resemble reality raises the question whether or not icons deserve a place in visual communication? Larsen (2008, p. 73) has tried to respond to this argument by noting that the same interpretation of the Clinique ad could have been reached even if the same objects appeared "as a counter display in a department store." That is, even if no pictorial signs were interferred in the interpretation. Larsen (2008) suggested that both icons and symbols exist in images and form a continuum of cases. The proposition that icons or symbols might co-exist in visual communication, however, does not answer the question of whether such imaginative images should be seen as symbols or icons. It seems that Scott (1994) raises a more fundamental epistemological issue around the nature of the object-sign relation in representation.

Scott's argument (1994) takes as its starting point the implicit assumption that the sign has to resemble readers' experiences with objects. It considers objects as something stable that signs are to be compared with. Peirce (EP2, 478), however, defines "a sign as anything which is so determined by something else, called its Object". Peirce seems to suggest that it is the object that determines its sign. This idea of an object determining its sign might be clearer in photography. Photographs derive their visual truth, at least before photo editing technology, from the supposition that photographs are at least partly determined by the photographed objects (Messaris 1997). In the more difficult case of highly imaginative drawings like cartoons, it might still be suggested that it is the object that the artist has in his/her mind that determines the drawing.

The anchoring point in representation might not be the sign, but the object. Readers of visuals know that what the sign primarily represents is not their own experiences. This is not to state that the reader does not have to associate the sign with his or her own experiences. However, the proposition that signs have to resemble objects as experienced in readers' mind goes slightly against the informative nature of communication (Grice 1975). This proposition restricts communication to the function of reactivating readers' existing knowledge structures. However, taking the object as being the starting point in the object-sign relation, then it might be proposed that it is not the image itself, but rather the object that is imaginative. Signs might be primarily thought of as resembling the communicators' experiences. The extent to which the communicators' and readers' experiences coincide reveals the similarity of their experiences (of objects) rather than the similarity between an object and its sign.

3.1.2 *Stylistic Properties*

The second argument against resemblance states that stylistic elements, like angle of view, might always be interpreted symbolically (Scott 1994). For example, Meyers-Levy and Peracchio (1992), in order to explain the effects of camera angle on consumers, draw inter alia on Lakoff and Johnson's (1980) metaphor account. Meyers-Levy and Peracchio (1992) propose that camera angles can refer to other natural world visual experiences. For instance, low-angle shots can be conceptually related to the positive view of looking up at our parents when we are children, whereas high-angle shots are suggestive of looking down on younger siblings, which generally are associated with a negative and subordinate view of the object. Similarly, Scott (1994) refers to a lipstick ad where the depicted products are arranged in the ad's photo in such a manner that the advertised brand is being heroized by means of resembling such categories as "a colonnade, a church choir, or a parliamentary seating arrangement" (Scott 1994, p. 255).

So far, the present chapter has suggested that visual signs that do not resemble readers' experiences do not necessarily defy iconicity. The argument about angle of view further suggests that there is no single way of depicting reality -the communicator inescapably has to choose a certain angle of view to depict it. Yet, the fact that there is no single way to depict reality does not mean that the sign does not resemble a reality. Taking as a starting point the object in the object-sign relation, the image might still be thought of as representing the communicator's reality. The argument about stylistic properties, however, points to the observation that often images can only be fully understood if read symbolically. The implicit premise is that the iconic function of images is not sufficient for understanding visual communication. The latter argument, rather than questioning the existence of icons, questions their value in communication. Do, however, symbolic interpretations undermine the value of icons? Recent research indicates that individuals could still view works of art as a mere illustration (Hagtvedt and Patrick 2011). That is, icons still keep their representational function despite any additional symbolic meanings attached to them.

The argument that symbolic meanings undermine the representation value of icons entails the implicit premise that symbolic interpretation equals symbols. A symbolic interpretation, however, might not render the sign a symbol. Similarly, a symbol might not be the same as a symbolic interpretation. Symbols refer to the way an object is associated with its sign. For example, a symbol like the word "table" does not resemble a table, but it is only conventionally associated with the idea of a table. Yet, we do not commonly understand the interpretation of words as being symbolic. We will suggest that this is because what is being interpreted symbolically is not the sign itself, but the object of the sign. For

example, a table might be symbolically associated with the idea of family gatherings. In this case, it is the sign's referent that symbolically represents family gatherings rather than the vehicle that evoked the "table" concept. The way the table was initially evoked by means, for example, of a symbol like a written word or an image might be kept distinct from its symbolic interpretation. It seems that it is the initial literal referent that a sign intended to convey that is being interpreted symbolically. It is in the light of this that symbolic or literal interpretation might be better analyzed via the object-interpretant relation.

3.1.3 *Representational Function*

The third argument against resemblance can be traced back to Goodman's (1976) conventionalism theory. The theoretical underpinnings of the view that images do not copy reality can be found in Goodman (1976), who rejects resemblance as a general quality that cannot itself establish a relationship of reference. For example, Goodman (1976) observes that all the cars coming off an assembly line resemble one another, but nevertheless none is a picture of any of the others. That is, resemblance might exist without representation. Therefore, he concludes that conventionalism better explains the representational function of signs. That is, individuals recognize that something represents something else based on conventions -a function that resemblance alone cannot attain (Files 1996). However, Goodman (1976) seems to demand from resemblance (a dyadic relationship) more than it necessarily seeks to offer -that is, a complete triadic account of representation (Files 1996).

While the argument about the need for an interpreting mind seems justified, Goodman (1976) leaves the interpreting element of Peirce's (1931-58) system of signs out of his analysis when he construes conventionalism as a dyadic symbolic relation between a sign and an object (Files 1996). Goodman (1976) seems to suggest that symbols incorporate a representation function because they themselves, by definition, stand for something else. Symbols point to their object by means of conventions or rules established over a long period -a function that icons might not be able to accommodate on their own. The question then is whether a representation function is actually built into symbols because their purpose is to represent another concept?

As Goodman (1976) suggests the establishment of a representation function requires the recognition of a communicative purpose. A representation function, however, might be kept distinct from the type of association (Files 1996). A car cannot represent another car because it cannot alone act as a representation bearer. Conventions dictate whether resemblance serves a communicative purpose. For example, the individual should know whether the car is being used to refer to another car. We would argue, however, that in the same way that

resemblance needs an individual to recognize a representation function, there is nothing inherent in symbolic associations that make them point to their objects. Although symbolic associations might be thought of as automatically pointing to a referent, the fact that a symbolic association might be drawn does not suggest that this will have an effect on an individual.

Peirce's idea of signs, objects and interpretants as indispensable elements of the sign system points to the incompleteness of a theory of representation without all three elements being brought together. Icons, symbols, or indexes as types of associations alone, however, might not be sufficient to explain representation. For such associations to function as representation bearers they should have an effect on an individual (Peirce 1931-58). As Goodman (1976) suggests these dyadic relations require a cognitive agent to function as signs of something else. Individuals might have to identify whether a sign should act as representation bearer out of convention-based or resemblance-based associations. There seems to be nothing inherent in symbols or icons that indicate whether one type of association should be preferred over the other. For example, the sign "I" can be read as a column or as the word "I". It seems that a linguistic code still needs to be identified as such for the code to function as a symbol. The identification process might involve such issues as whether a linguistic mark resembles a symbol. For example, whether "I" appears along other linguistic marks in a printed page or within a painting or whether "I" itself resembles more a linguistic mark rather than a real column. This is information that rests outside the linguistic code. Yet, the observation that resemblance-based inferences might be required for linguistic codes to be recognized as such does not make them icons.

It suggests, however, that for a sign to function as a representation bearer, individuals should recognize such a function and identify the type of association (iconic, symbolic, or indexical) for signs to have an effect. This discussion might indicate that both icons and symbols function out of convention (Scott 1994). This might be a valid proposition. But, conventions might not make resemblance less useful for a theory of representation. Conventions might not govern whether a sign resembles its object, but rather whether representation should function out of resemblance-based associations. Similarly, conventions might dictate when conventional-based associations should be used in representation, but this might not make symbols any more or less conventional. Icons or symbols materialize when they manage to have an effect whereas resemblance or convention-based associations describe the route to such an effect. It is not clear why a theory of communication should dismiss different types of association in favor of an undifferentiated idea of a purely conventional system of representation.

A purely conventional approach to visual representation, in a similar way to a copy approach to visuals, seems to extend a type of relationship (i.e.,

symbolic) between a sign and an object to the relationship between sign and interpretant (i.e., symbolic interpretation). Put another way, the argument against resemblance often frames the problem in terms of the nature of the relationship between a sign and its object (Scott 1994). The main drawback, however, in past research might not have been the misidentification of the form of this relationship, but the belief that interpretation should be limited to the identification of the visual objects (Kosslyn and Chabris 1990). The copy view of visuals prescribed the effect the sign should have on individuals based on the nature of the relation between the sign and its object. That is, imitation was seen as the main purpose of visual representation. In a similar way, conventionalism sees symbolic object-sign relations as dictating interpretation.

3.2 The Interpretant-Sign Relation

Peirce suggested that signs (icons, symbols, and indexes) signify their objects in distinctly different ways. Different types of associations, however, might co-exist in visual representation. Typography might be such an example. Research on the style of lettering indicates that the way a word is written can be interpreted symbolically based on the similarity of its physical appearance to other experiences (Doyle and Bottomley 2006; McCarthy and Mothersbaugh 2002). Such resemblance-based associations might fundamentally be categorized as icons because what signifies is the special way of writing a word -the particular way of rendering the code or its physical features- rather than the linguistic code itself. Similarly, the way a word sounds might also attach additional meaning to its object (Lowrey and Shrum 2007). This stream of research indicates that signs have a physical existence of their own based upon which individuals can attach additional similarity-based associations (Tufte 1997).

In a similar vein, convention-based associations might be attached to an icon. For example, a heart might conventionally signify love. It seems worthy of investigation to explore the factors that make these alternative routes likely to have an effect on individuals. For example, what initiates the individual to draw on their cognitive environment to seek meaning out of alternative routes? It might be hypothesized that such a process requires additional effort on the part of the individuals. Further, it is difficult to imagine that individuals will make all possible associations that can be based on a sign. Some restrictions would seem to apply to this process in order for it to be economically feasible in cognitive terms.

A regular theme in the definition of alternative sign interpretations is the idea of breaking some rules or the perception of some incongruity (McQuarrie and Mick 1996). What makes things difficult is that alternative readings are often

called symbolic or metaphoric. The use of symbolic interpretation conflates with the idea of convention-based associations (i.e., symbols). Yet, additional meanings seem to be initiated by a perception of incongruity. For example, Kennedy (1982) defines visual metaphor as the deliberate contradiction of standard canons of depiction in order to make a point, but not to revise or reject the standard canon. Kennedy's (1982) definition of visual metaphor implies that the visual sign system evolves. That is, Kennedy is trying to differentiate visual metaphor from actions that try to revise or reject the standard canon. In that respect, Kennedy's (1982) view coincides with Scott (1994) idea of conventional ways of depicting objects. For example, Scott (1994) eloquently discusses how visual language has evolved from realism to abstract representation.

Although it is not difficult to accept that the sign system evolves, it seems debatable whether visual theory should abandon the effort to investigate the essential nature of mediation between signs and objects. For example, it is hard to deny that there are different degrees of arbitrariness in the relation between the sign and its object in different visual representation styles. Even if we learn how to identify similarities between an object and a sign, this might inform the degree to which an association is based on resemblance or conventions (Larsen 2008) rather than rejecting similarity judgments.

Incongruity might be analysed in terms of representativeness. The idea that symbolic interpretations question the association between a sign and its object rather than the representativeness of the object might stem from the fact that additional meanings are attached to the object. This might be seen as questioning the established association between the sign and its object. For example, the metaphor "man is a wolf" simultaneously points to a real person and a wolf (and all the knowledge associated with these objects), but it might also be seen as disregarding the convention that the word "man" should refer to a person not a person-wolf entity. The object (man) has been informed (by means of associating it with a wolf). Therefore, "man" in this particular communicative context is no longer a typical member of what we would commonly categorize as "man". We might therefore locate incongruity in the discrepancy between what the symbol "man" conventionally signifies and what "man" refers to in the metaphor "man is a wolf". What ultimately is being indicated here does not seem to be the type of association, but the effect the symbol "man" has on the interpreter.

Similarly, a highly imaginative hybrid image of a person and wolf still has to point to known objects. At the same time, however, the reader is invited to see the person as wolf. The person depicted no longer represents a typical member of the category "man". The depicted person is unrepresentative of other persons. Thus, what is being violated is not so much the standard canons of depiction

(Kennedy 1982) rather than our standard canons of categorization. This reflects the intuitive idea that the sign is not representative of a real object (Scott 1994). However, it is the object that is unrepresentative of other similar objects rather than of the canon of depiction. The sign still represents this particular untypical object or person.

A number of studies have tried to categorize visuals based on surface differences -for example, distinguishing between juxtaposition and hybrid images (Forceville 1996; Gkiouzepas and Hogg 2011; McQuarrie and Mick 1999; Phillips and McQuarrie 2004). Such accounts, however, rather than categorizing surface differences in depiction, they identify violations of our knowledge structures. For example, a hybrid image of a wolf and a person challenges our basic knowledge that these two objects do not commonly form a single entity. In the light of this, Lakoff and Johnson's (1980) suggestion that metaphor is a matter of cognition rather than of language might be extended to the visual domain (Forceville 2002). Two more or less dissimilar objects are combined in a more or less unrealistic fashion. Relational violations (Biederman, Mezzanotte, and Rabinowitz 1982), however, might merely be part of our knowledge about how objects are related to each other in a given context.

This might further suggest that juxtaposition or hybrid types of images do not reflect visual categories *per se*. Visual rhetoric types might better be seen as categorizing the contexts within which violations of our knowledge structures are to be judged. Thus, such categorizations might be highly sensitive to the objects that are included (Gkiouzepas and Hogg 2011) and to the communicative context. For example, in a replacement visual a single object is replaced by another less expected object whereas in a hybrid image a part of a single object is replaced by a part of another object (Gkiouzepas and Hogg 2011). We experientially know that hybrid objects are less likely to be observed in real settings because they violate a more fundamental relation. That is, the context in which violation is judged in hybrid images is that of the unity of an object. Under such an account of visual incongruity, stylistic mannerisms might be seen as still another type of violation. Stylistic elements, however, do not introduce a single entity, but rather an atypical attribute such a low angle of view. Such an attribute can only define an abstract category such as "objects seen from a low angle of view" (e.g. parents, skyscrapers, powerful others, etc).

Ultimately, the reasoning underlying such categorizations of visual types seems to be inductive. That is, individuals, based on past observations, judge the extent to which a particular visual arrangement coincides with their knowledge about the world, without, however, ever being able to completely exclude such a possibility that there is no real world equivalent (Rips 1975). This might be because we do not commonly consider our experiences as forming a finite population. We are aware of the fact that our experiences are only a sample of

the universe of instances. However, we also have beliefs about how strongly attributes and objects are associated with each other (Rosch et al. 1976). What might deserve more attention in research on visual rhetoric types is the extent to which the individual sees such irregularities as justifying the expenditure of cognitive resources to re-categorize the depicted object as something else in order to be able to interpret the visual imagery.

3.3 The Object-Interpretant Relation

In visual communication theory, the relation between the interpreter and the represented object has received little attention. We suggest that interpretation, either literal or symbolic, might not be characterized by the nature of the relationship between a sign and its object. For example, an image of a heart might be seen as resembling an organ or as representing love. In both cases, however, it is the sign's referent (i.e., heart) that is categorized in an individual's cognitive environment as an organ or as an emotion. Peculiar to abstract concepts such as love is that no clear perceptual features can be associated with them. Interpretation might be seen as starting from the recognition of such an association; and relies on whether or not the individual accepts this (literal) interpretation as sufficient for understanding its meaning in a communicative context, or if a re-categorization of the identified object is required.

Categorization studies posit that individuals identify objects at a basic level category, commonly characterized by the name of the object such as "hammer" or "chair" (Rosch et al. 1976). Categories below the basic level are subordinate categories, for example, "claw hammer" or "kitchen chair". Subordinate categories contain many attributes that overlap with other categories. In contrast, superordinate categories do not refer to specific objects, but to more abstract concepts such as "tools" or "furniture". The members of a superordinate category have fewer attributes in common. The process of judging the identity of objects is based on the validity of a given perceptual or functional cue/attribute (x) as a predictor of a given category (Rosch et al. 1976). For example, the cue validity of the motor action of sitting down on a chair might be high for the category of "chairs". Both functional and perceptual information inform the cue validity of an entire category, which might be defined as the summation of cue validities for each of the attributes of the category (Rosch et al. 1976).

Symbolic processing might be understood in terms of the relation between an object and an interpreting mind. The essence in symbolic processing, however, is that the represented object is understood in a different way. A clear example where individuals are invited to interpret an object in a new way is that of metaphor. Metaphor has been defined as understanding one thing (i.e. the target) in terms of another (i.e. the source). The definition of metaphor implies that

symbolic processing might be analyzed in terms of the target object, the source object, and the process involved in understanding the former in terms of the latter.

What does it mean, however, to understand objects in new ways? The category-transfer model (Glucksberg and Keysar 1990) posits that individuals, in order to understand metaphor, have to form an ad hoc category. For example, the metaphor "my job is a jail" induces a general category which includes objects that are confining or unpleasant. The feature-matching model (Ortony 1979) adds to our understanding of metaphor comprehension by suggesting that the source of the metaphor (e.g., jail) possesses highly salient features (e.g., involuntariness, confinement) that are not as highly salient in our understanding of the target (e.g., jobs). Finally, the structural alignment model (Gentner, Bowdle, Wolff, and Boronat 2001) suggests that the objects are first matched for higher order (similar) relations and then lower order (but otherwise dissimilar) local matches are projected from the source to the target of the metaphor. For example, confine(prisoners) might be matched to confine(employees).

In the present paper, we propose a categorization-based (Rosch et al. 1976) model of interpretation that draws from current accounts of metaphor. In particular, objects might be seen as being either literally interpreted when they are being identified within established categorizations and/or seen in terms of symbolic interpretation when the cue validity of an existing (or a new) attribute is being increased in the established categorization of an object. For example, in the metaphor "my job is a jail" the cue "lack of freedom" increases its validity in the new ad hoc categorization of jobs as compared to its validity in the established categorization. A literal interpretation, however, might only be possible in theory because whenever an object is categorized within established categorizations, the cue validity of its associated attributes are more or less being reinforced.

Cue validity is an important concept in our theory because it suggests that not every attribute is equally likely to anchor a new ad hoc category, but only those attributes that have the higher cue validity for that category. The cue validity of the attribute(s) anchoring the ad hoc category might also explain why some salient features of the sources remain unmatched (Camp 2006). An attribute of high cue validity in the source domain does not guarantee that the level of its validity will remain the same in the ad hoc category. This is because the attribute has the role of predicting (unifying) new members (e.g. jail and job) in the new category while still discriminating that category from others.

The validity the common attribute had in established categorizations might also play a role in symbolic processing. That is, individuals might prefer those attributes that still preserve, to an extent, the literal or established (and therefore proven in time) categorizations of objects. All things being equal, features that

are more salient (have a high cue validity) for a given target (i.e. having discriminative power) might also be preferred over less salient features. The underlying premise is that it is to individuals' advantage to maintain the overall structure of their cognitive environment. This might explain the difficulty category-based models (Glucksberg and Keysar 1990) had in explaining why different effects might be produced when the same source is applied to different topics (Camp 2006). For example, "my marriage is a jail" might not produce the attribute "living in a small cubicle" as compared to the metaphor "my job is a jail" (Camp 2006). This might be because the validity of the "small cubicle" cue might be less than other possible features (e.g., lack of freedom) in the marriage domain. This is not to suggest that only attributes having a high cue validity in the target domain will be preferred -which might account for the idiosyncratic nature of some interpretations in symbolic processing (Phillips 1997).

Idiosyncratic meanings might be considered as such because the attribute selected might have lower cue validity than other possible matches in the target domain. For example, choosing the attribute "unbroken" as a likely attribute to be transferred in marriages might even sound counter-intuitive because the attribute might not have the same cue validity (context notwithstanding) for marriages as "lack of freedom". In turn, such as an idiosyncratic selection will result in lower cue validity for the ad hoc category. For example, it might not predict the new ad hoc category as effectively as the attribute "lack of freedom" might predict the new members (jail and marriage). In a similar vein, an idiosyncratic interpretation might reflect a selection of an attribute (e.g., being served tasteless food) that does not have high cue validity in the source domain. This is because the ad hoc category has also to predict the source of the metaphor (e.g. jail).

Our conceptualization of symbolic and literal processing might also explain the idea of metaphor informativeness. For example, selecting highly salient attributes that result in ad hoc categories and that have high total cue validity might not be considered informative. This is because objects that share highly salient attributes might already have been accounted for or associated within established knowledge structures. In fact, such matches come close to a literal categorization. However, metaphors might point to features that were not noticed or (being even more informative) they might introduce new features to the target. Therefore, the idea of informativeness points to new knowledge -that is, features not previously highly associated to the target.

This might explain why not all metaphors are equally informative. For example, just pointing to an already highly salient attribute does not significantly alter established knowledge structures as compared to the introduction of new features or the increase of the cue validity of a previously low salient attribute. Therefore, informativeness might be defined mainly in terms of the magnitude of

change in the cue validity of the target attribute. The cue validity of a new attribute, for example, will have to increase from zero in the target domain. It is in this light that a literal or a symbolic interpretation might be understood in categorization terms. Further, the higher the magnitude of change, the more symbolic the interpretation. Put another way, the greater the magnitude of change the more distinct will be the ad hoc category as compared to the established categorizations of the object.

Magnitude of change might also be understood in terms of the metaphor's source. Ortony (1979) suggested that a high salient source attribute that matches a low salient attribute of the target increases perceptions of metaphoricity. We further suggest, however, that salience imbalance might ultimately be understood in terms of the magnitude of change in the validity of the target attribute. In particular, a high salient source attribute reflects individuals' beliefs about how strongly this attribute is associated with its object. Thus, the strength of association in the source domain might moderate the resulting magnitude of change in the target attribute (Gkiouzepas and Hogg 2014).

However, theories of metaphor are trying to account for the whole set of attributes that could possibly be transferred in a metaphor or for cross-domain mappings (Bowdle and Gentner 2005). In the metaphor literature, aptness reflects the extent to which a metaphor source captures important features of the target of a metaphor – thus, aptness might be strongly influenced by attributes that fail to map onto the target of a metaphor. Aptness and conventionality (metaphor familiarity) were thought of as being orthogonal. For example, a metaphor can be apt without being conventional "Beavers are lumberjacks", but also a metaphor can be conventional without being apt "The clue is a red herring" (Thilbodeau and Durgin 2011). Aptness is, however, a problematic notion because it correlates with metaphor conventionality and manipulations of processing fluency (Thilbodeau and Durgin 2011).

Although the metaphor and analogy literatures are not strictly linked to each other, the notion of aptness in metaphor is related to the idea of analogical soundness (Gentner, Rattermann, and Forbus 1993). In the analogy literature, however, soundness refers to the subjective perception of a structural match between the domains compared in an analogy. That is, the extent to which the domains share a relational system (i.e., common relations between attributes or other relationships). Although it is well documented that structural similarity increases perceptions of analogy soundness, structural similarity is commonly contrasted with surface physical similarities between attributes such as in the analogy "the glass gleamed like water" (Gentner et al. 1993).

Further, the analogy literature tends to hold an undifferentiated view of relational similarity. For example, when comparing a film-based camera to a digital camera, the objects button and flash from the film-based camera can be

mapped onto their counterparts in the digital camera (Moreau, Markman, and Lehmann 2001). Similarly, in the analogy "a battery is for a mobile phone what an energy drink is for an individual", individuals might align the battery to the energy drink and the mobile phone to the individual based on the relational similarity that both of them provide energy to their objects. However, individuals might not only have "beliefs about properties of category members, but also have beliefs about the properties of such properties" (Rips 2001, p. 824). Therefore, similarity might extend beyond a general match between objects' features (Gregan-Paxton and Moreau 2003) to the equivalence of the experiences (or attributes) compared in a metaphor.

For example, the energy provided by a battery to a mobile phone might be perceived as being different from the energy a drink offers to an individual -for instance, being of a different kind or serving different functions. An individual, for instance, might use the energy to run whereas the mobile phone might use the energy to serve as a camera. The equivalence of the attributes might then go beyond surface perceptual or relational similarities between components and involve the nature, functions, agents, or goals commonly associated with these properties. Structural relationships therefore might not be able alone to explain the effects of attribute equivalence. Attributes are not independent from their respective domains, but neither are they necessarily reducible to a general structural match.

Related to this, Heit and Rubinstein (1994) have found that individuals were more willing to make the inference that "whales have a liver with two chambers that act as one" when based on the premise that bears have the same anatomical property as compared to the premise that tunas have the same anatomical property. However, they were more likely to infer that "whales usually travel in a back-and-forth or zig-zag trajectory" based on the premise that tunas rather than bears behave in the same way. That is, inferences were stronger when the kind of property (anatomical or behavioral) matched the kind of similarity between the animal categories (anatomical or behavioral). This research might suggest that the attributes selected are based on the validity of the common attribute -that is, its power to unify the new category while discriminating the new category from others.

Thus, judgments of cue validity might not only involve a general match between features, but also include knowledge about the attributes themselves. The finding that metaphor conventionality is highly correlated to the construct of aptness (Thilbodeau and Durgin 2011) is not surprising given that some conventional metaphors might only reflect the extent to which the common cue is highly salient in the source ("The clue is a red herring") and successfully predicts the members (clue and red herring) of the ad hoc category. Deception is a highly salient feature of the "symbolic" meaning of red herring. However, it

fails to capture other attributes of the "clue" domain. That is, the total cue validity (all common attributes considered together) in the ad hoc category formed by the analogy "The clue is a red herring" might be lower than for the "Beavers are lumberjacks".

However, the former metaphor might not be as apt as the latter because the common attribute (deception) might be experientially less equivalent in the clue-red herring than in the beaver-lumberjack coupling -not least because the attribute of deception is only "symbolically" related to red herrings. Yet, it efficiently captures "deception" in the abstract target domain (i.e. clues). Conventional sources might capture important features of the target, but the common attribute might not be experientially similar (i.e. less apt). Apt metaphors might have common attributes that are experientially similar and thus increase judgments of familiarity. However, aptness in this latter case might not be a sufficient condition for a metaphor to become conventional because the metaphor is experientially redundant.

In terms of the structural alignment model, it might be suggested that the higher order relation deception(red herring) and deception(clue) might not be as identical as the relation saw(beavers) and saw(lumberjacks). This might reflect individuals' knowledge about these functional cues. For example, the object of the "saw" function in beavers and lumberjacks is similar (i.e., a tree). Thus, relational and feature similarities might not be as independent as the structural alignment model seems to suggest. Higher order relations might reflect individuals' extended knowledge of cues -that is, feature similarity need not be bound to perceptual properties. In sum, the structural alignment model might be seen as deepening our understanding of symbolic processing by proposing a way to structure and hierarchize the cues that might be selected for categorization

4 Discussion

The present paper presented a unified theory of visual communication based on Peirce's system of signs. In particular, we described the visual domain as a system of interrelationships between signs, objects, and interpretants. Some time was devoted to trying to define visual communication in terms of the relation between signs and objects and the corresponding issues of representational resemblance and correspondence. This stream of research has advanced visual theory by pointing to the richness of visual meaning. Despite these efforts, however, visual theory might have missed the essence of visual communication, which might be about pointing to the world outside the visual domain.

What might be more fundamental in trying to understand how visual communication works in visual imagery (such as advertisements) is to try and grasp the relationship between objects and interpretants. To that end, the present chapter has proposed a new way of conceptualizing literal or symbolic

interpretation based on a basic human function –that of identifying and categorizing objects in the world by clustering attributes together (Rosch et al. 1976). We conceptualized literal and symbolic interpretations not in terms of the object-sign relation, but as the extent to which a sign induces established knowledge structures or invites individuals to alter those structures about the depicted object. We believe that the way attributes are clustered together and metamorphosed seems to be a promising way of conceptualizing visual communication that can inform our theories of symbolic processing. We hope that our paper helps visual theory move beyond the debates over representational realism and initiates debates about theories of how individuals' knowledge structures work

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