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Fake Guns and Stone Lions: Conceptual Blending and Privative Adjectives

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1. Introduction

Kamp (1975) defines a privative adjective as one for which, given adjective A and noun N, the claim 'No AN is a N' is necessarily true. For example, 'fake' is a privative because 'No fake gun is a gun,' is true by definition. In order to explain how 'fake' acts as a modifier, the semanticist's job has been to provide a mechanism for specifying the similarities and differences between real and fake guns. Because, at least at first blush, privatives pose a greater problem for the semanticist than, say 'brown cow,' Franks (1995) has argued that privative constructions should be employed as a test for models of conceptual combination. One such model is Franks' (1995) sense generation model. Another is offered by conceptual blending theory (Coulson, 1997; Fauconnier & Turner, 1996). In this paper we contrast the treatment of privative adjectives in these two models. Specifically, we compare how the examples 'fake gun' and 'stone lion' are dealt with in conceptual blending theory and in the sense generation model. Although both models are motivated by the observation of substantial flexibility and context-sensitivity in actual instances of meaning construction, these phenomena are dealt with differently in the two models. While Franks' approach is an attempt to extend objectivist semantics to explain data which resist a strictly compositional account, our own model is motivated by ideas in cognitive semantics. In contrast to the view of language as a code which combines context-invariant meanings, the cognitive semanticist argues that language provides clues for the language user to flexibly address her knowledge base so as to construct a contextually appropriate message-level representation.

2. Conceptual Blending

Conceptual blending is a set of operations for combining cognitive models (Lakoff, 1987) in a network of *mental spaces* (Fauconnier, 1994), viz., partitions of speakers' referential representations. In this section we provide a general introduction to conceptual blending, including its relationship to mental space theory. Many traditional approaches to language assume that elements of linguistic structure can be systematically decoded to yield a propositional representation of the meaning. In contrast, cognitive semanticists treat language as a tool for construing conceptual content. In mental space theory, then, the primary purpose of language input is to help speakers integrate linguistic information with background and contextual knowledge in order to formulate an overall understanding of the discourse situation.

2.1 Mental Spaces

Mental space theory (Fauconnier, 1994) is a theory of *referential structure*, a level of conceptual organization between the situation being described and the linguistic structures that describe it (Langacker, 1993). Consequently, words do not refer directly to entities in the world (nor to elements in a set-theoretical model). Rather, linguistic cues prompt speakers to set up elements in referential structure that may or may not refer to objects in the world. Created to represent discourse that concerns various factive (as well as non-factive) contexts, mental spaces can be thought of as temporary containers for relevant information about a particular domain.

On Fauconnier's (1994) model, a mental space contains a partial representation of the entities and relations of a particular scenario as perceived, imagined, or remembered by a speaker. This representation typically includes *elements* to represent each of the discourse entities, and simple *frames* to represent the relationships that exist between them. Speakers set up spaces in order to partition the information evoked by a discourse into a series of simple cognitive models. Links between spaces capture the relationships that exist between elements and their counterparts in other spaces. In this way, complex scenarios can be represented by a series of mental spaces and connections between them.

2.2 Trashcan Basketball

Imagine two college students are up late studying for an exam. Suddenly, one crumples up a piece of paper and heaves it at the wastepaper basket. As the two begin to shoot the 'ball' at the 'basket,' the game of trashcan basketball is born. Because it involves the integration of knowledge structures from different domains, trashcan basketball can be seen as the product of conceptual blending. In conceptual blending, frames from established domains (known as *inputs*) are combined to yield a hybrid frame (a *blend* or *blended model*) that contains partial structures from each of its inputs, as well as unique representational structure of its own. For example, in trashcan basketball, the input domains are trash disposal and (conventional) basketball, and the resultant blend incorporates a bit of both domains to yield a novel concept.

Conceptual blending involves the temporary construction of simple cognitive models and the establishment of cognitive mappings between different spaces. A *mapping*, or *mental space connection*, is the understanding that an object or element in one space corresponds to an object or element in another space. For example, when we call a crumpled up piece of paper a 'ball' we are exploiting a mapping between two domains. Because one way of understanding the object is as a crumpled up piece of paper, we can structure one mental space, call it the Trash domain, with a simple cognitive model of a piece of paper. However, in our game it's understood as a trashcan basketball. So in another mental space, this same object is represented by a cognitive model of a trashcan basketball.

Thus mental spaces are used to represent each of the domains, while linked elements represent the identity of the ball in Trashcan Basketball with the crumpled paper in the Trash domain. Moreover, the idea of trashcan basketball doesn't come out of nowhere, but by analogy to the *real* game of basketball played with a leather ball and a ten-foot basket. Mental space connections can be based on identity, similarity, or analogy. Moreover, when a mental space connection exists between two elements, the Access Principle allows speakers to refer to an element in one mental space with a word more appropriate for a linked element in a different space (Fauconnier, 1994).

Because a proper understanding of the game of trashcan basketball involves the simultaneous apprehension of the relationship between knowledge recruited from established domains as well as aspects of the novel concept, it is represented in a *conceptual integration network* (Fauconnier & Turner, in press). A conceptual integration network is a network of mental spaces structured with frames the speaker constructs from contextual information and background knowledge. The prototypical integration network is comprised of four mental spaces, one for each of the input domains, one for the blended domain, and a generic space which represents abstract properties that apply to structure in all of the spaces.

For example, Figure 1 represents the conceptual integration network for the concept of a trashcan basketball. In this network, there is an input space structured by a model built from knowledge about basketball, an input space with cognitive models of trashcans, and a blended space with a cognitive model that combines information from the two inputs. Although the generic space in this example is not elaborated in Figure 1, it is included in the network because abstract, schematic information derived from the blending process can be appealed to in extensions of the concept. In this example, the generic space involves throwing an object into a container and suggests the initial cross-space mappings between the Trash and Basketball domains.

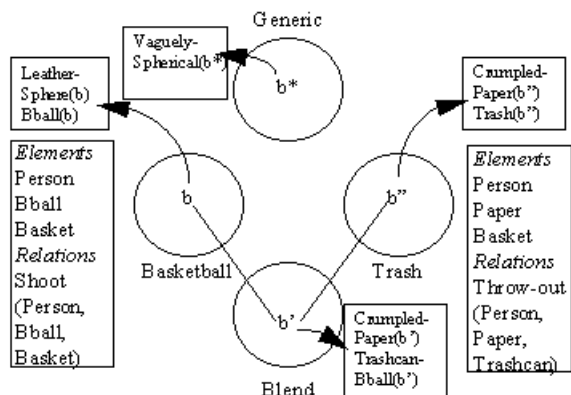


Figure 1. Conceptual Integration Network for Trashcan Basketball

Importantly, trashcan basketball does not result from an isolated mapping between a wad of paper and a basketball. Rather, it arises from a whole system of correspondences which speakers can establish between the various domains. Further, the emergent features of the combined concept trashcan basketball can be seen as arising in part from abstract processes of conceptual projection from one domain to another -- understanding a wad of paper *as* a basketball. However, it also arises out of concrete interaction with the trashcan basketball in the course of the game. Because the physics of interacting with a piece of paper are different from those of interacting with a leather ball, participants in the game will naturally discover the differences in the objective features of shooting a regular versus a trashcan basketball.

Meaning construction in conceptual blending is thus both flexible and knowledge-rich. Frames recruited for integration in a network can vary from context to context, as can the nature of the integration. The content of a particular conceptual blend depends on the amount and type of knowledge available about the input domains. In the absence of particular knowledge about a domain speakers rely on default models of prototypical instances. However, speakers can also construct models which are highly idiosyncratic in response to situational demands.

2.3 Blending Processes

Blending involves three processes, composition, completion, and elaboration, each of which provides for the possibility of emergent structure. *Composition* involves attributing a relation from one space to an element or elements from the other input spaces. Composition can be as simple as integrating two elements such as 'Sally' and 'Paul' with a simple frame, such as Daughter-of. Composition also occurs in trashcan basketball when the frame for Ball is integrated with the element b' set up to represent the crumpled up piece of paper. Although emergent structure in composition might appear to be due to the juxtaposition of predicates and arguments from different input domains, it actually arises from contextual accommodation of a concept from one domain to apply to elements in a different domain.

Completion is pattern completion which occurs when structure projected from the inputs matches information in long-term memory. For example, in trashcan basketball, if one student shoots and the other attempts to defend the goal, pattern completion could result in evoking the frame for a one-on-one basketball game. Completion is closely related to *elaboration*, a process which involves performance and/or mental simulation of the event in the blend. For example, one might employ elaboration in order to understand the concept of moon rock basketball, basketball played on the moon with moon rocks. The activation of novel structure can either be done by computation, or, as in the trashcan basketball examples, may rely extensively on interaction with the environment as construed with existent blended models.

In this section we have gone over some of the introductory concepts in conceptual blending theory. We suggest that the processes of conceptual blending are rooted in speakers' imaginative capacities. In particular, blending processes rely heavily on cross-space mapping abilities which enable speakers to forge links between elements whose objective properties can differ quite substantially. We return to conceptual blending in section 4 where we discuss how conceptual integration networks can be used to represent the meaning evoked by privative constructions. However, in the next section we turn to the sense generation model, a leading model of concept combination in cognitive science.

3. Sense Generation Model

Franks (1995) argues that the sort of conceptual combination which occurs in privatives is in fact no different from conceptual combination of nouns with other sorts of adjectives (c.f. Kamp, 1975) and poses the sense generation model to account for a number of different privative constructions. The way the model generates a sense for a particular combination of privative and head is by ascribing features to a discourse referent set up to represent the combined concept.

One feature of Franks' account is his acknowledgment of the importance of perspectival relativity in classification judgments and how it serves to limit the generalizability of those statements in particular ways. As in mental space theory, perspectival relativity implies that we can adopt various perspectives on the same discourse referent. This allows us to understand a particular apple as a dessert, a cricket ball, or a still life, depending on what perspective we have adopted. In the sense generation model, perspectival relativity is handled by *pegs*, or discourse referents, and *alecs*, perspective-relative instantiations of pegs.

Moreover, as in conceptual blending, meanings are built up in context based on information available from long-term memory.

In-context meanings, or *senses*, consist of attribute-value structures (AVS). Senses of privative constructions are built up in a similar way as senses for other sorts of compounds: by recruiting attribute-value structures for the modifier and the head, and performing operations on the representations in order to yield the resultant compound sense. The core of the sense generation model is its three processes for sense generation: unification, priority union, and metonymic type coercion.

Unification is a monotonic operation which simply summates the two sets of features. Consequently, unification can only occur when there is no conflict between the values of shared attributes of the component concepts. The second process, *priority union*, is used in cases where the two concepts have conflicting values for a given attribute. When combining concepts A and B to form AB, the combined concept inherits all nonshared attributes and non-conflicting attribute-value pairs directly. In cases where A and B have a conflicting value for a given attribute, the combined concept inherits the value of the modifier. Thus priority union is unification with overrides.

More relevant to privative constructions, *metonymic type coercion* (MTC) is a process by which the modifier can alter the sense of the head noun. There are two types of metonymic type coercion, *MTC with rebuttal* and *MTC with undercutting*. In both sorts of MTC, the attribute-value structure of the head is divided into central and diagnostic attributes. Privatives work as operators on the attribute-value structures of the head. Negative privatives such as 'fake' in 'fake gun,' or 'false' in 'false eyelashes,' trigger MTC with rebuttal. In this process, the central features of the head are negated while its diagnostic features are combined with those of the modifier via priority union. Equivocating privatives such as 'alleged' in 'alleged bomber' are dealt with via MTC with undercutting. In this process, the diagnostic attributes are inherited while the central attributes of the head are left unspecified.

An additional feature of the model, known as *implicit attachment*, can modify explicitly evoked senses by unification with contextually evoked concepts. If there is an informational demand for further specification, the attribute-value structure of an implicitly attached noun can be unified with explicit senses in the compound. For example, if you are in the park and someone says, 'stone lion,' the AVS's for 'stone' and 'lion' could be unified with the AVS for an implicitly evoked noun such as *statue*.

3.1 Fake Guns and Sense Generation

Franks (1995) demonstrates the sense generation model by showing how it handles the celebrated example 'fake gun.' The first step in sense generation for this construction is the activation of the AVS for the head noun 'gun'. Franks proposes Fires(Bullets), Made-of(Metal), and Function(Kill) as central features of the concept gun, and Trigger(+), Barrel(+), and Handle(+) as diagnostic features. Because 'fake' is a negating privative, it is handled by MTC with rebuttal. Consequently, the central attributes of 'gun' are negated while its diagnostic attributes are maintained. The end result is an AVS matrix for an object that looks like a gun, but lacks its essential properties.

The sense generation model also provides two mechanisms for context-sensitivity. The first is the context-sensitivity of the initial activation of the AVS for 'gun'. Contextual and communicative constraints can constrain the initial activation of values in the AVS. Moreover, if there is a need for further specification in order to individuate the referent, the sense generated for 'fake gun' can be unified with the AVS for a situationally appropriate noun via implicit attachment. This can result in different AVS matrices for a 'fake gun' which is a *toy*, and a 'fake gun' which is a *replica*. Overall, the sense generation model provides a rigorous way of accounting for similarities and differences between real and fake guns.

3.2 Deceptive Simplicity

Or so it would seem. However, the success of the sense generation model is highly dependent on the assumption of default models. By examining less prototypical cases of 'fake gun,' we find that there is more to being a fake gun than not firing bullets. For example, consider the case of an old, rusty gun that no longer works. It has all the diagnostic features of a gun, and lacks certain essential features. Yet even if such a gun were used in a robbery, it's unlikely that speakers would deem it a 'fake gun.'

On the other hand, imagine that someone buys the defunct gun at a garage sale with the express intention of using it in a robbery. Perhaps he wants people to think it's a gun, but doesn't want to actually hurt anyone. In this scenario, our rusty gun probably would be deemed a 'fake gun,' albeit an atypical one. The importance of the faker's plans and intentions in this example is not readily handled by the sense generation model. This is because it does not incorporate a crucial component of being fake: the faker's intention to create a discrepancy between his own beliefs about the fake object and those of his victim or victims. Moreover, a successful fake implies that the audience reacts to a fake gun in the same way they might react to a real gun.

We suggest that the real/fake distinction lies beyond the attributes of the gun itself. Rather, the character of a fake gun will depend on the faker's motivation, the scenario in which the gun is to function, and the knowledge of the prospective victim. For example, in a prototypical scenario where a burglar holds up a store with a fake gun, the important thing is for the object to look like a gun. Other diagnostic features such as weight are far less important. However, if the victim is a gun collector, and the con-artist wants to sell him a fake 19th-century gun, a successful fake will likely have most of the diagnostic features, and most of the central ones as well.

In fact, the best fake 19th-century gun is probably a real gun which was manufactured just after the turn of the 20th century. At this point an advocate for classical (and 'quasi-classical') approaches to concept combination might object that the modification of 'gun' by '19th-century' will require adding Manufactured-in-the-19th-century(+) to the set of central attributes. However, while this objection explains why our fake gun was not manufactured in the 19th century, it leaves the issue of why it *can* fire bullets unanswered. Further, we can just as well imagine a parallel scenario in which the fake gun is lacking in the diagnostic features of a gun.

For example, imagine that we are attempting to sell a fake Colt 45 to a collector. Although the object has been mangled beyond recognition, we have cleverly inscribed the trademark onto what might have once been the gun's handle. Knowing that collectors consider this inscription to be the hallmark of authenticity, we tell our victim that the gun was damaged when it was confiscated by the FBI and show him the trademark. This mangled mass of metal lacks any gun features except for one (presumably central) one.

Thus it would seem possible to have fake guns which possess central attributes of guns^[1], as well as ones which lack diagnostic attributes.

4. Conceptual Blending and Fake Guns

In the last section, we explained how the sense generation model accounts for the meaning of privative constructions such as 'fake gun.' The term 'fake' is an operator which alters the AVS matrix for *gun* by maintaining attributes which are diagnostic, while negating those which are central. However, we have presented examples suggesting that the determination of shared versus nonshared attributes is often a function of the situational factors which surround the use of a given gun. In this section we suggest that the property of being fake is not just a matter of the properties of the gun. Rather, the meaning of fake lies in the relationship between the intentions of the actor who uses a fake gun, and the potential reaction of the actor's audience. In fact, understanding constructions such as 'fake gun' is primarily a matter of mapping, and involves the ascription of features only derivatively.

We suggest speakers treat 'fake' as a space builder that prompts a mapping between an actual scenario in which the actor employs the fake gun, and a counterfactual scenario in which his audience reacts as if it were a real gun. For example, in Figure 2 we sketch a blend in which the actor uses a plastic gun to rob his victim. The object in the blended space inherits the property of being plastic from the space that represents the actor's knowledge. Moreover, it inherits the property of being a gun from the victim's belief space. The establishment of this sort of a mapping goes beyond the mere presence or absence of central versus diagnostic features, and relies on the speaker's ability to coordinate frames in actual and counterfactual spaces via cross-space mappings.

In the default scenario that Franks evokes to demonstrate the sense generation model, the mappings between the fake gun model and its counterpart in the gun domain are similarity mappings between features in the object frames. However, being fake need not entail similarity between the fake object and its counterfactual counterpart. The important thing is that its properties might induce the victims to believe that the counterfactual scenario obtains. In the right context, a single feature might produce the desired belief. For example, a pipe in the back of the neck, a hairbrush in the raincoat, or a balloon popping in a room full of hostages with their heads to the floor might all serve as fake guns. In 1997, in a testament to the adage that truth is stranger than fiction, Carlos Diaz was sentenced to 18 years in prison for stealing \$20 and a watch while armed with a zuchinni concealed in his jacket.

Determination of what features are relevant requires the construction of a model of the actor's actions and the victim's perception of those actions as illustrated in Figure 3. Mappings are constrained by the understanding that in the faker's mind there is a causal connection between his own actions and the victim's beliefs. Of course, the victim need not *actually* be deceived for the fake object to be a fake.^[2] However, the characteristics of fake objects arise because of the way in which the intent to deceive is central to the concept of fake. Conceptual combination in each case is driven by the way in which theory of mind determines cross-space mappings between the actor's intention and the victim's would-be belief. Diagnostic features of guns, both fake and real, result from apprehension of the more extensive set of mappings between the relevant spaces.

In conceptual blending, the ascription of features is only a side effect of coordinating the representational structure in the various spaces. Consequently, projection, representation, and rerepresentation can all make objective features of the gun largely irrelevant.

For example, suppose we're comparing two gun diagrams in order to determine which one is the fake. While neither of the drawings has the central attributes of a gun, we might single out one of them because (in the drawing) the barrel is solid rather than hollow. Although diagrams bear little objective resemblance to guns, conventions for diagrammatic representation allow us to map between relevant aspects of the diagram and our knowledge of guns. Further, socially defined activities such as play present similar problems for a feature-based account.

For example, if I'm playing cops and robbers, I might stick my thumb in the air and point my index finger at my playmate saying, 'Give me the money, or I'll shoot!' After he complies I might laugh saying, 'Hah! It's only a fake!' In this case, whether I had a real gun or not, bullets wouldn't come out of my finger. Moreover, in such a context, the difference between a real gun and a fake gun might well involve whether my playmate pretends to die after being shot with the gun. Because conceptual blending theory relies on the establishment of mappings based on similarity, identity, and analogy, it predicts the use of these relational counterparts as well as the similarity-based ones. We elaborate on the importance of relational counterparts in the next section.

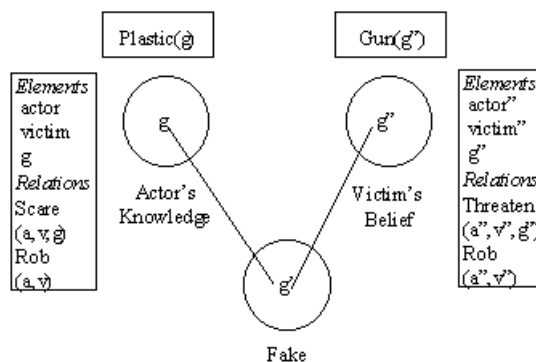


Figure 2. Spaces in Fake Gun Blend

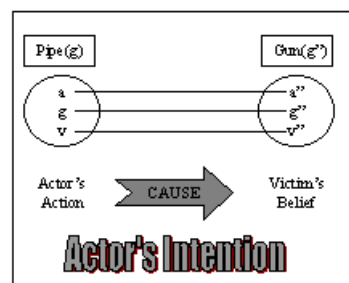


Figure 3. Actor's Intention in 'Fake Gun'

5. Stone Lions

Besides 'fake' and 'alleged,' Franks (1995) points to a third type of privative construction, the *functional privative*. Functional privatives are adjectives (or adjectival nouns) that behave like privatives in some constructions but not in others. For example, 'stone' acts like a privative in 'stone lion' but not in 'stone bridge.' In this section we describe how the sense generation model handles 'stone lion' and contrast it with the treatment of these sorts of constructions in conceptual blending theory. We argue that a major shortcoming of the sense generation model is the lack of a mechanism for cross-domain mapping.

5.1 Stone Lions in the Sense Generation Model

To account for functional privatives such as 'stone lion,' the sense generation model appeals to the mechanism of implicit attachment in which the AVS of a contextually evoked word can contribute to the meaning of the combined concept via priority union. Because implicit attachment is such a potentially powerful mechanism, it is subject to certain constraints. First, an implicit attachment, or NI, is required to be situationally appropriate. Further, an implicit attachment must be subsumed by the sense of the

phrase it instantiates. In his discussion of how the implicit attachments (NI's) are derived, Franks (1995) writes:

The NI lexical concept is then the concept associated with the head noun of a phrase that individuates the referent. For example, if a discourse or text states that, *A girl was sketching a stone lion in the park*, the instantiation of *stone lion* would likely be as a statue of a lion, and not an ornament in the shape of a lion. The NI lexical concept selected would then be statue, and not ornament. This is one constraint on NI selection: In addition to being situationally appropriate, an AVS description of the instantiation must be subsumed by the sense AVS of the phrase that it instantiates; in this case, the AVS for a *statue* of a lion would be subsumed by one for *stone lion*.

Although the sense generation model provides a clever mechanism to provide the meanings for functional privatives in which the head is physically constructed from the modifier (as in 'stone lion'), it is compromised by the requirement that the implicitly attached lexical concept be subsumed by the phrase it instantiates. In the sentence, 'A girl was sketching a stone lion in the park,' Franks discusses the reading where 'stone lion' refers to the statue in the park. However, in this context 'stone lion' might just as well be interpreted as referring to the girl's drawing. A sketched stone lion is not a lion any more than a stone lion is a lion (from the reality perspective), but unless the lexical concept for 'sketch' is subsumed by that for 'stone lion' it cannot serve as an implicitly attached concept.

For the sense generation model to work, then, the lexical concepts for stone and lion must be such that they can subsume senses of 'statue,' 'ornament,' and, apparently, 'sketch.' However, this suggests the lexical concept for 'stone lion' is a veritable Pandora's Box, containing all the AVS's which 'stone lion' might possibly assume in context. As noted above, 'stone lion' could refer to a pictorial representation of a stone lion such as a sketch, a painting, or a photograph. In a dramatic production (perhaps a sequel to *CATS*), 'stone lion' might refer to a plastic prop which represents a statue in the play. Or, if the statue is played by a human actor, 'stone lion' would refer to a person representing herself as a statue representing a lion. In fact, the flexibility of speakers is such that unless the lexical concept of for each word contains an infinite set of AVS's, the sense generation model will be unable to account for all possible instances of word usage.

5.2 Blending Stone Lions

However, the crucial factor in meaning construction in these cases is not feature unification, but conventions for mapping. Just as Picasso and Michelangelo utilize different representational conventions, so too do different modes of representation, such as sketches, photographs, dramatizations, and the like. The deep reason for the existence of these constructions is that we have a general notion of *representation* as well as experience mapping between different sorts of representations. Understanding functional privatives is not as much a problem of semantics, as of understanding the representational conventions that allow us to map between spaces with different degrees of iconicity. Thus by positing general blending mechanisms constrained by conventions of representation, we make a special feature mechanism superfluous.

Further, a general blending mechanism provides a better account of the way in which features accommodate (in Langacker's 1987 sense) to the different domains in which they occur. For example, the sense in which a trashcan basketball is 'round' differs from the sense in which a leather basketball is 'round.' In conceptual blending, to say that both balls are 'round' means that the element set up to represent each ball can be integrated with a frame for *round*. The jagged character of the *roundness* of a trashcan basketball is an emergent property which can be *perceived* by participants, and *conceived* by people who can imagine a crumpled up piece of paper. In blending theory, this sort of composition need not entail the ascription of objective properties. Rather, it relies on the speaker's ability to exploit relational aspects of cognitive models to establish mappings.

Moreover, 'stone lion' can also assume any number of metaphorical meanings that the sense generation model is entirely unable to handle. A 'stone lion' might be a very stoic lion, or a lion which stands very still. Similarly, if the family cat assumed a frozen pose in the course of hunting a robin, it might be referred to as a 'stone lion.' Finally, 'stone lion' could be used to refer to objects with almost no connection to real lions, such as a deposed dictator in exile, or an idea which seemed forbidding at one time, but was never instantiated.

While the connection between 'stone lion' and these latter two concepts is not straightforward, neither is it random. Because mappings in mental space theory can be based on identity, similarity, and analogy, it affords a unified treatment of stone lions which are representations of lions, representations of stone lions, metaphorical stone lions, and even representations of metaphorical stone lions, as in a painting of the family cat stalking his prey.

Moreover, while most of the above examples are privative, the conflicting features of 'stone' and 'lion' do not seem to preclude non-privative treatment of 'stone lion.' For example, in an exhibit at the zoo, we might use 'stone lion' to refer to the lion asleep on a stone, the lion standing by the big stone, the lion who was once asleep on the stone, a lion with a stone around his neck, a lion

playing with a stone, and so on. These are examples of a phenomenon Clark (1983) has referred to as the *contextuality* of interpretation.

In conceptual blending theory, the contextuality of language use is attributed to creative mechanisms that can build new models in response to background and local information. Because the overt language of a nominal compound such as 'stone lion' provides minimal clues to how the integration of input frames is to proceed, the language user is forced to rely on contextual information and background knowledge. An important aspect of conceptual blending theory, absent from the attribute-value listing employed in the sense generation model, is the use of structured representations which facilitate cross-domain mappings. Because the representations evoked in mental spaces are hierarchically structured such that causal and relational information is readily available, they enable the establishment of mappings that help constrain the projection of structure to the blend (see also Wisniewski & Gentner, 1991).

6. Conclusions

Our main argument against the sense generation model has been that it seeks to characterize concept combination at the wrong level. Its main shortcoming is its reliance on the ascription of objective features rather than on the higher-level mapping operations that define such features. Conceptual blending is offered as a superior approach to concept combination, because of its appeal to causal and relational information represented in cognitive models; for the use of contextually motivated models rather than representations which have been artificially divided into central and diagnostic features; and, for the role of cross-space mappings constrained by concepts for deception and various kinds of representation.

For humans, representation is not just an internal mental activity, but a physical and a social one. Sometimes part of being a gun is the builder's intention to make a gun. Similarly, sometimes being a gun is the result of stipulating that an object is a gun. Because human activity involves the projection of partial structure from domain to domain, there is far more counterpart structure in the world than we typically realize. Like our two students playing trashcan basketball, this counterpart structure is not just recognized but actively imposed.

Further, tracking this counterpart structure does not involve the apprehension of objective features, but the integration of their perception with contextually relevant frames. Consequently, an adequate account of meaning construction needs a mechanism (such as mental spaces) which can represent the complex embeddings due to drama, pictorial representation, pretense, beliefs, and so on. Moreover, it points to a non-traditional locus of conceptual productivity. Rather than the algorithmic combination of discrete concepts (monotonic and nonmonotonic combinations alike), our observations point to the importance of the human ability to accommodate frames at various levels of abstraction to suit varying contextual conditions.

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[1] In fact, if we compare the number of armed robberies in which a gun is used to threaten versus those in which shots are actually

fired, one might argue that the essential feature of a gun is not to shoot, but to threaten. John Barnden has noted that if this is indeed the case, then its quite common for fake guns to possess a central feature of a gun.

[\[2\]](#) In fact, we probably have the concept *fake* because actors often fail to fool their victims.