What is More Memorable, Counterintuitive Concepts Interpreted Metaphorically or Literally?

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Abstract

A survey of randomly selected sample of television advertisements indicated that a significant number of these ads contain counterintuitive concepts. This makes sense in light of recent findings that suggest that minimally counterintuitive ideas are more memorable than intuitive ideas. However, a subsequent experiment performed to investigate the role of context in the memorability of such concepts suggested that counterintuitive concepts are only more memorable when they are interpreted literally rather than metaphorically.

Keywords: cognition and culture, counterintuitive concepts, memory, language

Introduction

What is it that makes some ideas more memorable than others? Why do people remember some messages while forgetting others? Finding answers to such question is not only important for cognition and culture researchers but also for marketing experts, consumer researchers, and advertisement designers who have to design ads that cut through the clutter of hundreds, if not thousands, of advertising messages that average consumer is bombarded with every day (Lasn 1999). Advertisers have to make sure that consumers remember their ads and recall them when they make their purchasing decisions better than their competitor's ads. It is not surprising then that marketing researches have considered a number of factors that are thought to impact the memorability for advertisements. These include relevance of an advertisement (Heckler & Childers 1992), the emotional appeal of an ad (Huang 2004), and the incongruity of an ad with the customer expectations, sometimes called the "shock-value" of an ad (Dahl, Frankenberger, & Manchanda 2003).

Cognition and culture researchers, however, have proposed another variable not considered, to date, by the marketing researchers namely, the *counterintuitiveness* of an idea. Boyer (1994), Sperber (1996), and others have argued that everything else being equal, minimally counterintuitive concepts (i.e., concepts that violate one ontological expectation) such as the concept of a sobbing oak) are more memorable than intuitive (concepts that do not violate any ontological expectations (such as a green oak) and maximally counterintuitive concepts (i.e., concepts that violate multiple ontological expectation such as a talking flying oak). Not all of this comes as a surprise to marketing researchers who have long known about the role played by novelty in making advertisements memorable. Indeed creative designers often employ elements that are designed to violate and challenge consumer's preconceived notions about a brand (Lee & Schumann 2004). Several studies show that incongruent ads are more likely to be perceived as original, humorous, and produce positive affective responses than congruent ads (Lee and Mason 1999; Alden, Mukherjee, & Hoyer 2000). Hecklers and Childers (1992) found that some types of incongruent ads are better recalled than congruent ads.

This evidence is supplanted by the work in social psychology and schema theory which indicates that when new information that is somehow incongruent with prior expectations or schema is presented, individuals will engage in more effortful or elaborative processing (Hastie and Kumar 1979; Mandler 1982). This extra processing of schema-violating information results in enriched connections being established among the new piece of information and existing knowledge structures which in turn results in better recall for the new information. This may explain why counterintuitive concepts are better recalled by people than intuitive concepts. Counterintuitive ideas that involve violations of expectations of basic categories should specially have transmission advantages as knowledge about such categories is shared by most people and hence are likely to bee seen as incongruent by most people. However, it does not explain as to why maximally counterintuitive concepts which violate even more intuitive expectations and hence should result in even more elaborate processing are not recalled better than minimally counterintuitive concepts.

To explain the better recall for minimally counterintuitive concepts (MCI), previously (Upal 2005) I have argued that maximally counterintuitive concepts are not recalled well because they cannot be coherently organized into an easy to remember schema (or that they have low *postdictability*). The *memorability hypothesis* (Upal 2005; Upal *et al.* 2007) states that the concepts and the contexts that maximize the $(postdictability - predictability)$ value should be best remembered by a learning agent that aims to build a predictive model of its environment because they offer most new information that cannot be foreseen by that agent.

Given a concept embedded in a text such as the concept of a flying cow shown in Figure 1, postdictability of a concept is defined as the ease with which that concept's inclusion in a piece of text can be justified after the textual unit containing that concept has been read and predictability of a concept is the ease with which the occurrence of the concept can be predicted prior to its having been read.

Odd News of the Day
  Bowling Green (KY): July 18, 2004. "I had just woken up and went to the kitchen to prepare some coffee to drink," said the Kentucky farmer Edwin Smith. "That's when I saw **the cow flying above the trees**. The twister had lifted the 500 pound creature well over 50 feet above the ground and was rotating it around like a doll. That was a scary experience," said Smith.

Figure 1: Prior context of the concept "cow flying above the trees" is shown in italics and the posterior context is shown in Arial type.

The memorability hypothesis explains that MCI concepts are more memorable because they are not easy to predict (low predictability) but are easily to explain once they have been seen (high postdictability). Intuitive concepts are not as memorable because they have high predictability and high postdictability. Maximally counterintuitive concepts, on the other hand, are less memorable than MCI concepts because they have low predictability as well as low postdictability. Minimally counterintuitive concepts thus represent a cognitive optimal for learning because they contain just enough new information that can be easily integrated with the learner existing knowledge.

Since predictability and postdictability value of a concept vary by the context in which a concept is embedded, the memorability hypothesis allows us to predict how changes in the prior and posterior context of a concept will impact the memorability of a concept. Let us say that a concept C embedded in a context T_1 has D_1 predictability and S_1 postdictability. If we change C's context to T_2 which changes its predictability to D_2 and postdictability value to S_2 then this change will increase C's memorability if and only if decrease in predictability is less than the decrease in the context's postdictability i.e.,

$$D_1 - D_2 > T_1 - T_2.$$
Otherwise, C will be less memorable in the new context.

While minimally counterintuitive ideas have been mostly investigated in the context of religion, if the claims about MCI ideas being more memorable are true then it would be surprising if they weren't found in other domains such as marketing with the pressure to produce ads that have staying power in consumer's minds. Further, if the memorability hypothesis is true then cognition and culture researchers may have some practical advice for advertisement designers about how to manipulate the memorability of individual concepts in ads. This paper studies the prevalence of minimally counterintuitive (MCI) concepts in commercial advertisements. The first study was designed to explore the prevalence of such concepts in television advertisements. The follow up study was designed how the context in which such concepts are embedded in affects the recall for such concepts.

Overview of Study One

This study was designed to see whether counterintuitive ideas are widespread in commercial advertisements as they are in religious contexts (Pyysiäinen, Lindeman, & Honkela 2003; Lisdorf 2004).

Material & Method

We randomly selected one hundred television advertisements from AdCritic.com, the largest online tv commercial data base. The selected ads were watched by two hypothesis blind coders who were asked to look for the presence/absence of any counterintuitive concepts (objects or events) in the ads.

Results & Discussion

The two coders agreed on the ratings for 85% of the ads. For the remaining 15%, one coder (the '*liberal coder*') found them to contain counterintuitive concepts while the other coder (the '*strict coder*') found them not to have a counterintuitive object or event in those ads. Neither coder found any ad containing maximally counterintuitive object or event. The liberal coder found that 37% of all ads examined had minimally counterintuitive concepts while the strict coder only found 22% of the ads to contain such concepts. Discussions aimed at resolution discovered a pattern among the ads in dispute. These ads appear to have features that can be classified as counterintuitive when the definition of counterintuitiveness is strictly applied as an object or event that has features that violate ontological assumptions about objects of that category. For instance, one of the ads shows a balloon popping out of an individual's head. The strict coder argued that this is a metaphor for the person having a Eureka moment which would make it intuitive since people can have Eureka moments. However, the liberal coder who literally interpreted the concept found a balloon coming out of an individual's head as violating his intuitive expectations about people since people's heads do not pop balloons. Even though both coders agreed that most of the counterintuitive concepts were unambiguously counterintuitive, a significant number of such concepts (a little over 40% of all counterintuitive concepts) could be interpreted metaphorically which made them intuitive, in at least the eyes of the strict coder. We wanted to see what

the implications of this were for memorability. Does interpreting counterintuitive concepts metaphorically make them less expectation violating and hence less memorable or does it make them more memorable because they are instances of figurative use of speech which people find more memorable? We designed Study II to answer such questions.

Overview of Study Two

Metaphors i.e., describing one thing in terms of another, are a common linguistic expression (Lakoff & Johnson 2003). Conventional wisdom indicates that metaphors and other figurative uses of language make the language more effective and persuasive. Students of rhetoric from Greeks to the present day argue that metaphors and other figures of speech can improve the quality and persuasiveness of one's speech (Aristotle 1952, Osborne & Ehninger 1962). Numerous self-help guides on how to improve one's speech recommend the use of figurative language to improve one's public speaking ability. Studies involving direct comparisons of the recall rates of an idea expressed metaphorically with the recall rate of the same idea expressed literally suggest that metaphorical use leads to better recall (Gibbs & Nagaoka 1985; Read, Cesa, Jones & Collins 1990). This may help explain why most advertisements use figures of speech (75% according to a survey of 2400 ads, Leigh 1994). However, the question that we are interested has not been investigated by these studies, namely, whether recall rates of the same textual expression would vary as the context in which it is placed is varied from one favoring the metaphorical interpretations to one supporting the literal usage of those concepts.

The memorability hypothesis suggests that literally interpreted concepts should be recalled better because they have lower predictability values than metaphorically interpreted concepts. Thus we expected the metaphorically interpreted concepts to be recall less frequently than literally interpreted concepts.

Material & Method

We designed two short stories (about 200 words each) containing six counterintuitive concepts each (shown in Appendix). Two versions of each story were designed for a total of four stories. One version reinforced the literal interpretation while the other supported the figurative interpretation of the embedded concepts. Packets containing two stories each were then designed. Each packet contained literal version of one story and metaphorical version of the other story. Four packets were prepared by changing the order in which stories appear: Packet 1 contained the literal version of Story 1 followed by metaphorical version of Story 2, Packet 2 contained the metaphorical version of Story 2 followed by literal version of Story 1, Packet 3 had literal version of Story 2 followed by metaphorical version of Story 1, and Packet 4 contained

the metaphorical version of Story 1 first and then the literal version of Story 2. Twenty eight University of Toledo undergraduate and graduate students ranging in age from 16 to 40 years participated in the experiments. Subjects were asked to read both stories to understand them so that they could answer questions to follow. Next, they were given a distraction task involving simple arithmetic problems to solve for one minute. Following this they were asked to recall both stories.

Results & Discussion

Two hypothesis blind coders (same coders as used in Experiment 1) were asked to code each response by whether the subject had recalled a concept or not. Initially, coders agreed on 97% of the concepts. The remaining differences were resolved through discussion and a common coding arrived at. This coding indicated that subjects recalled 64.3% (108 concepts out of 168 total concepts) of concepts embedded in literal meaning supporting concepts while only 38.7% (65 out of 168 concepts) embedded in metaphorical supporting concepts were recalled. This means that changing the context in which concepts are embedded from literal to metaphorical, we were able to decrease the recall for counterintuitive concepts. Memorability hypothesis suggests that this happens because our subjects expected the concepts we employed in our stories to be interpreted metaphorically rather than literally and hence concepts in metaphorical contexts had higher predictability values than concepts in the literal contexts. However, since all the counterintuitive concepts in metaphorically interpreted stories are interpreted metaphorically and all the counterintuitive concepts in literally interpreted stories are interpreted literally, after reading the first few concepts readers should be able to develop expectations about what type of concept interpretations are to follow. That is if the first few concept are also interpreted literally subjects will have higher expectations for a literal interpretations of the following concepts, and if the first few concepts are interpreted metaphorically predictability ratings for the following metaphorically interpreted concepts should be higher. Thus if the observed difference between the recall rates is due to higher predictability values for metaphorical concepts then this difference should be most pronounced for the concepts that appear first in the stories. That is the memorability hypothesis predicts that differences in recall rates between the first concepts read by the subjects under the two conditions should be higher than differences between the recall rates of the last concepts read by the subjects under the two conditions. A second prediction of the memorability hypothesis is that recall rates for the concepts that appear first in the stories should be higher than the concepts that appear last in the stories because by the time readers reach the last concepts, they have developed expectations e.g., whether these concepts are likely to be metaphorically interpreted or literally interpreted. These higher predictability values should result in lower recall for the concepts that occur last in the stories.

Table 1: Number of times the first and the last concept were recalled in literally and metaphorically interpreted versions. The recall rates (i.e., the number of times each was recalled divided by 28) are shown in parenthesis.

	Literal Interpretation	Metaphorical Interpretation
First Concept	28 (100.0%)	15 (53.6%)
Last Concept	16 (57.1%)	7 (25.0%)

As Table 1 shows the difference between the recall rates of the concepts read first (42.9%) are higher than differences between the recall rates of the concepts read last (28.6%) and the recall rates of the concepts read first are higher than the recall rates of the concepts read last. This is what we expected to find. These results add to the accumulating evidence for the view that context plays a critical role in the memorability of counterintuitive concepts (Upal 2005; Gonce *et al.* 2006; Upal *et al.* 2007). Counterintuitiveness is not the inherent property of the concepts themselves but of the concepts along with the context in which they are embedded.

Conclusions

Study 1 advances the state of research in cognition and culture by showing that counterintuitive concepts are widespread in a non-religious domain, namely, that of commercial advertising. This further supports the notion that such concepts have memorability advantages that help them spread faster and farther. The second study further supports the findings that context in which people encounter concepts occur plays important role in making these concepts more or less memorable. Our findings also support the notion originally advanced by Franks (2003) that counterintuitive conceptual representations do not necessarily involve negation of ontological properties and that, "a more plausible account may be forthcoming by allowing a more complex approach to the representations, deriving from understanding their nature as concept combinations." (page 41). Our analysis adds to that of Franks by identifying metaphorical conceptual combinations and by studying their impact on memorability.

These experiments also have important implications for the marketing researchers and practitioners. First, we explain why counterintuitive concepts are so prevalent in commercial advertisements. Second, our experiments provide further empirical support for the memorability hypothesis which can be used to design more memorable messages.

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Appendix

Story 1

Literal Meaning Supporting Version

When I went to the office this morning I saw a couple of suits walking by. Most people in my office don't wear suits so I was surprised to see people in Armani suits.

I glanced at the headlines on the newspaper as I sat in my chair. It said something about the crown announcing a sharp reduction in the income tax. I was surprised to read about a tax cut by the left wing labor government.

My boss called me into office his before lunch and told me to work with the bright intern Monica we just hired. She came highly recommended and the company hopes to hire her permanently if she does well.

My secretary told me that she has to take the rest of the day of to go to a relative's wedding. Blanche has deep roots in the area. She knows more about the area than anyone would ever want to know.

It's almost quitting time. I guess I'll have to leave soon. I hate going home to a chatty couch potato. He sits at the couch all day long and complains about getting fat.

On my way home I usually listen to talk radio. Boy this host has a sharp tongue. I have heard that he is just as quick witted in real life as he is on the radio.

I took the leftover food from the fridge when I got home and heated it up to eat it. I think I fell asleep as I was watching tv.

Metaphorical Meaning Supporting Version

When I went to the office this morning I saw a couple of suits walking by. No body was wearing the suits and I was surprised to see them moving around without feet or legs.

I glanced at the headlines on the newspaper as I sat in my chair. It said something about the crown announcing a sharp reduction in the income tax. I was surprised to read about a talking crown.

My boss called me into his office before lunch and told me to work with the bright intern Monica we just hired. Her whole body emits a greenish yellow light that can be seen from quite a distance.

My secretary told me that she has to take the rest of the day of to go to a relative's wedding. Blanche has deep roots in the area. She carries a knife with her so that she can cut her roots whenever she needs to walk.

It's almost quitting time. I guess I'll have to leave soon. I hate going home to a chatty couch potato. I thought it will stop talking after I peel its skin but it still talks.

On my way home I usually listen to talk radio. Boy this host has a sharp tongue. I have heard his tongue is made out of steel and he uses it to cut objects.

I took the leftover food from the fridge when I got home and heated it up to eat it. I think I fell asleep as I was watching tv.

Story 2

Literal Meaning Supporting Version

Bob got a letter from an old flame. Bob thought about how a flame could have written a letter. Why didn't the paper burn when the flame tried to write on it? The letter said, "thanks for your note, Sweetheart. You are a heart made out of sugar and I am a flame. We can never be together." "Clearly this letter is not addressed to me," Bob thought. I have not written to anyone lately. He stuffed the letter back into the envelope and put it in a mailbox.

An interesting week I'm having he thought. Just last week, he found out that he had been accepted at the school of his dreams. He was walking on air. Gravity seemed to have no effect on him. People below him were surprised to see him walking in the air above their heads.

This weekend he met a girl with smoldering eyes. He was worried that fire in her eyes would burn something and thought about pouring some water on her face to put it out.

He felt an instant magnetic attraction towards her. Her body was made out of magnetic material that attracted objects towards her. He wasn't feeling very good so he decided to leave the party. On the way home his car broke down. It had been coughing for weeks. He gave her cough syrup yesterday evening but to no avail. He could hear her coughing all night long from his bedroom. He left the car by the side of the road and walked home.

Metaphorical Meaning Supporting Version

Bob got a letter from an old flame. Bob thought about what she must have been thinking as she wrote the letter. Could she be thinking of getting back together. The letter said, "thanks for your note, Sweetheart. I appreciate your desire to get back together but we are not meant for each other." "Clearly this letter is not addressed to me," Bob thought. I have not written to anyone lately. He stuffed the letter back in the envelope and put it in the mailbox.

An interesting week I'm having he thought. Just last week, he found out that he had been accepted at the school of his dreams. He was walking on air. He was just so

happy. His friends were also happy to see a smile on his face after such a long time.

This weekend he met a girl with smoldering eyes. He met her at a friend's party and had liked her the first time he saw her. "I'm lucky to have met her," he thought.

He felt an instant magnetic attraction towards her. It was as if something was pulling him towards her. All of a sudden, he wasn't feeling very good so he decided to leave the party. On the way home his car broke down. It had been coughing for weeks. He thought it was just the muffler but the engine had finally stopped. He left the car by the side of the road and walked home.