Explanations of comparative facts: A shift in focus

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Abstract

A comparative fact can be presented in two ways. 'Among white evangelical Christians, Obama had 40% fewer votes than McCain.' or 'Among white evangelical Christians, McCain had 40% more votes than Obama.' Focusing on why Obama had fewer votes than McCain may result in a different explanation from focusing on why McCain had more votes than Obama, although it is the same fact. Thus what determines whether we focus in our explanation on Obama or McCain?

In two studies, we show that people generally focused more on the first part of the comparative fact. However, when the comparative fact is presented in a negative frame ('less … than') there was a shift in focus from the first to the second part of the fact. For neutral items this moderating effect did not occur. The Principle of Lexical Marking (Clark, 1969) and Loss Aversion (Kahneman & Tversky, 1979) are discussed as possible accounts for this shift in focus.

Keywords: Explanation; Reasoning; Mental Representation

The focus of explanations

Absolute judgments are often more difficult than relative judgments (Laming, 1984; Miller, 1956; Stewart, Brown, & Chater, 2005). Evaluating whether the price of a new roof is expensive or not is more difficult than judging whether one quote is better value than another. As an aid, we often present facts in a comparative manner. The severity of the financial crisis in the UK, for instance, is seldom presented by itself but rather in comparison with other nations (the US or other European nations) or with previous crises. Advertisers use comparisons to highlight key features of their products in order to make a favorable evaluation easy to form.

The advantage of a contrast or comparison is not, however, restricted to judgments. It has also been argued that explanations for contrasts are in some circumstances easier than those for plain facts (Lipton, 2004). In line with Mill's Method of difference (Mill, 1862/2006), contrastive explanations explain a fact by highlighting the causal difference between the case to be explained and the otherwise similar case in which the fact does not hold (McGill, 1993). For instance, the severity of the financial crisis in Britain might be easier to explain by comparing it to that of the rest of Europe and finding differences between the nations that might account for it.

Unlike this example where the target of the explanation (the severity of the financial crisis in Britain) is apparent, there are cases where describing a comparative fact leaves open which part of the fact needs to be explained. Stating that, among white evangelical Christians, Obama had 40% fewer votes than McCain leaves open whether one needs to explain the appeal of McCain or the disapproval of Obama among those voters. Focusing on one or the other may result in a different explanation for the same fact.

Previous research has looked at this problem in terms of stereotyping (Grier & McGill, 2000), group typicality (Hegarty & Pratto, 2001) and Norm Theory (Kahneman & Miller, 1986). For instance, Miller, Taylor, & Buck (1991) observed that gender differences in voting behavior in the 1988 US election seemed to be exclusively explained in terms of women's voting patterns. In line with Norm Theory, they argued that men are considered the stereotypical voter and therefore the norm, whereas women are the more mutable voting group whose behavior could more easily change. Hence the explanations of the difference in voting patterns focused more on the 'deviant' behavior of women. To support their hypothesis, they asked people to explain differences in the number of doctor-visits that men and women in stereotypically male or female professions have in a year. The results revealed that explanations of a gender difference among University Professors focused more on women whereas the same difference among Elementary School Teacher was explained more in terms of men.

In contrast, Hegarty and Pratto (2001) have argued that the focus in explanations is not solely due to the mutability of one of the two groups' behavior but rather due to the groups' typicality within the relevant superordinate category. They asked participants for explanations of group differences between heterosexual and homosexual men in compliance with a treatment and found that people generally focused more on the characteristics of homosexual men. However when they changed the overarching treatment category from cancer to AIDS they found roughly equally many references to each group. They also showed that relative group size influenced who is considered the norm and as a result who is focused on. Furthermore they did not find any correlation of these effects with the mutability of the two groups. The behavior of homosexual men was consistently considered to be more mutable than that of heterosexual men.

Thus Hegarty and Pratto (2001) argued that rather than mutability, it is the typicality and size of the group that determines who is focused on in the explanation.

Present research

The above studies have highlighted some key aspects that influence what we focus on in our explanations—be it mutability of one of the groups, relative group sizes or typicality within an overarching group. In replicating one of the previous studies (Miller et al., 1991), we discovered two basic aspects of comparative facts that influence what we focus on in our explanations. These effects are important because they are more general than mutability, typicality and group size and therefore apply in cases where the others may not hold. To our knowledge these influences on the focus of explanations have not been reported before.

Experiment 1

The aim of the first experiment was to replicate Miller et al.'s (1991) study using adapted stimuli while addressing a methodological issue. The results of their study showed an overall main effect towards focusing on women in the explanation of doctor-visits. They attributed this effect to a high proportion of explanations that made reference to gynecological issues. Thus in Experiment 1 of the present study, doctor-visits were replaced with dentist-visits to counteract this bias. In addition, we extended the experiment by using an additional pair of professions (Football player & Ballet dancer) and including typical as well as neutral characteristics for each career.

Method

Participants 242 students at City University, London, (172 female) participated in the study. Participants volunteered or received course credits in return for participation.[1]

Materials Participants were asked to explain four facts. The facts were presented as findings of a large-scale study from a renowned research institute. Each fact described a difference between males and females on either a typical or neutral attribute for either a female- (Elementary school teacher / Ballet dancer) or male-dominated profession (Professor / Football player). Two facts were about professions in a teaching career whereas the other two were about professions in a sports career. The two neutral facts were number of Dentist-visits for the teaching careers and Cinema-visits for the sport careers whereas the typical attributes were the Communication skills for the teaching careers and Ambition for the sports careers.

Thus we had four professions with two attributes each. For each attribute by profession combination there were four conditions, here illustrated with the Football–Ambition item:

- Professional female football players are more ambitious than professional male football players.
- Professional female football players are less ambitious than professional male football players.
- Professional male football players are more ambitious than professional female football players.
- Professional male football players are less ambitious than professional female football players.

Each participant saw four facts, one of each of these four conditions rotated across the four professions each with one of the four attributes according to career path.

Thus there was a total of 64 possible stimuli derived from four conditions rotated across four professions with two types of attributes (typical vs. atypical) each.

Three-page booklets were created with the first page containing the instructions and a consent form. Each of the subsequent pages contained two facts. Below each fact were four empty lines for participant to write down their explanations. The order of the four facts was randomized with the constraint that neither facts for the same career path nor attributes of the same type appeared on the same page.

Procedure The study was conducted in group-sessions and participants took no longer than five minutes to complete the questionnaire.

Pretest Forty-eight (33 female) City University students completed a pretest to determine both typical and neutral attributes for each profession and verify their gender stereotypes. For each profession participants were asked to imagine a particular person in as much detail as possible. They were then asked to provide typicality ratings for nine attributes (three of each type of attribute: typical, atypical and neutral). After having provided typicality ratings for four pairs of professions (Flight attendant – Pilot, Nurse – Doctor, Ballet dancer – Football player, Elementary school teacher – University Professor), they were asked again to imagine a person in each profession, answer three filler questions and indicate either the gender or the name of the person they imagined to determine the gender stereotype. No differences were observed between these two ways of measuring the gender stereotype.

The Ballet dancer – Football player pairing showed the strongest stereotyping with 92% and 98% respectively confirming the stereotype. The Professor – Elementary school teacher pair was the second strongest in stereotyping with 90% and 85% confirming the stereotype. For each profession pair we chose the attribute with the highest average typicality rating as well as the one closest to the mid point.

Results

Coding Analysis Of the total of 968 possible explanations across the 242 participants, 42 explanations were missing or incomplete. Two independent judges coded the remaining

[1] An unequal distribution of male participants across the various conditions due to the relatively small sample size made an evaluation of the influence of gender on the focus of the explanations impossible.

explanations as either overall focusing on male or female characteristics. A further 12 explanations could not be coded as they did not contain a reference to a specific gender (e.g. "this is probably due to individual differences in this profession" or "I think this may be caused by gender socialisation processes"). The two judges had an agreement of just under 94% with Cohen's Kappa inter-rater reliability of .9. Consensus was found through discussion.

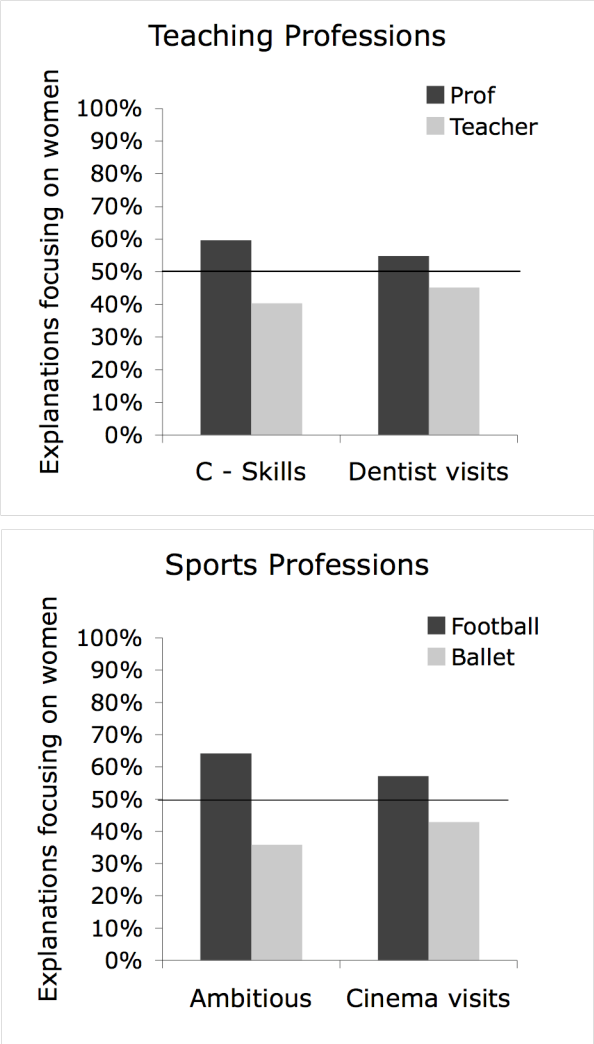

Figure 1: The influence of Gender on the focus of explanations.

Influence of Gender Figure 1 shows the percentage of explanations that made overall more reference to female characteristics. Each graph presents the profession pair for one of the two career paths across the two types of attribute. For both career paths, most explanations for stereotypically female jobs focused on men, whereas the reverse was true for explanations of attributes for stereotypically male jobs. Separate Chi-square analyses for each career path by attribute type inferentially supported these findings (see Table 1)[2]. This effect seemed to be somewhat weaker for neutral attributes than for typical attributes. However exploratory hierarchical loglinear analysis showed the effect to be constant across attribute types ($\chi^2(1, N = 912) = 1.03$, $p = .31$) and career paths ($\chi^2(1, N = 912) = .24$, $p = .62$).

Table 1: Chi-Square results for each attribute.

Attribute	Chi-Square
C-skills	$\chi^2(1, N = 227) = 8.58$, $p < .01$
Dentist-visits	$\chi^2(1, N = 230) = 4.99$, $p < .05$
Ambition	$\chi^2(1, N = 234) = 17.4$, $p < .01$
Cinema-visits	$\chi^2(1, N = 221) = 5.48$, $p < .05$

Influence of Position & Frame In addition to the influence of Gender, the data revealed that in 66% of the explanations people intuitively focused more on the group mentioned first in the fact (e.g., "Profession male football players are more ambitious than profession female football players."). This effect was independent of whether the profession was stereotypically male or female and the same across items ($\chi^2(1, N = 912) = 90.9$, $p < .001$).

However this bias towards focusing on the first part of the fact was moderated for some items by the way the fact was framed. Based on the odds ratio, framing a fact about a typical attribute in terms of 'less … than' (47%/53%) made it 5 times less likely that the explanation would focus on the first part of the fact than when it was framed as 'more … than' (82%/18%). For neutral attributes the framing did not influence the bias toward the first part of the fact (see Figure 2). Separate Chi-Square analyses for typical and neutral attributes confirmed that the bias interacted with the way the fact was framed for typical attributes ($\chi^2(1, N = 461) = 60.1$, $p < .01$) but not for neutral attributes ($\chi^2(1, N = 451) = .7$, $p = .42$).

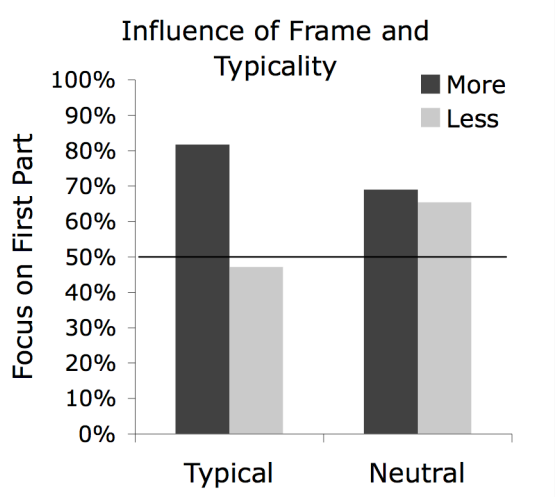

Figure 2: The influence of Frame and Typicality on the focus of explanations.

[2] Separating the analyses by items was necessary to ensure independence of cells.

Discussion

The results showed that for explanations of comparative facts people tended to focus on the less stereotypical member of the group, corroborating Miller et al. 's (1991) findings. Explaining a gender difference among members of a stereotypically male profession, most people pay more attention to the characteristics of female members, whereas the reverse was true for a stereotypically female profession.

Unlike Miller et al. (1991) however, we found that people intuitively paid more attention in their explanation to the group mentioned first. People tended to focus more on male football players when males were mentioned first and female ballet dancers when females were mentioned first despite the fact that they are the stereotypical group for each profession. In addition this bias towards focusing on the first part was moderated in typical attributes by the way the fact was framed. Thus when the fact was presented as 'less … than' (e.g., "Professional female football players are less ambitious than professional male football players") a larger proportion of people focused on the second group than when it was presented as 'more … than'.

To our knowledge this effect of framing in the realm of explanation has not been reported before. It represents an important finding because it shows that one can change what people pay attention to in their explanation by simply changing the way the to-be-explained fact is framed. Presenting Hilary Clinton as more liberal than Obama may elicit different explanations than presenting her as less conservative than Obama.

What is interesting about our data is that, although fairly strong for typical attributes (one is 5 times more likely to focus on the first part of the fact when the attribute is framed as 'more … than' than when it is framed as 'less … than'), the framing effect did not occur for neutral attributes. For neutral items there was a constant bias towards explaining the first part of the comparative fact.

What is the difference between being more or less ambitious and going more or less often to the cinema that makes the framing effect appear in the former but not the latter case? We termed the attributes as typical and neutral in regards to the different professions. However one might also consider them as positive and neutral. Being ambitious as a sports-professional and having good communication skills in a teaching profession are positive attributes, whereas the number of dentist- and cinema-visits do not really have either a positive or negative connotation in relation to either profession. If the typical attributes are perceived as positive, then a 'less … than' frame would be considered negative for the target group. Comparative facts have the characteristic that makes it possible to turn the negative frame for one group into a positive frame for the other group. Male footballer being less ambitious than female footballer means that the women are more ambitious than their male counterparts. Thus our data suggest that some people avoid focusing on the negative framing of a positive attribute and instead turn their attention to the positive framing of the attribute for the comparison group. This shift in focus only occurred for attributes that have a positive valence. It did not occur for attributes that are neutral in valence. People did not avoid focusing on the 'less … than' frame of neutral attributes like going to the cinema.

Experiment 2

The aim of Experiment 2 was primarily to replicate the finding that both the position and the way the fact is framed influence what we focus on in our explanations. A secondary purpose was to validate a new procedure in the testing process. Previous research including Experiment 1 used two independent judges to code the explanations. Here we asked participants, after having provided their explanation, to go through their explanation and evaluate whether the reasoning in their explanation was more about one or the other group presented in the comparison. This procedure avoids difficulties of interpretation in the coding stage and was more time-efficient.

Method

Participants 397 (55 male) students from the Catholic University, Leuven, participated in the study in return for course credits.

Design A between subjects design was used with Item topic (Sports vs. Politics), Item (Footballer vs. Ballet dancer or Liberal vs. Conservative), Frame (More vs. Less), and Position (whether Males or Females / Professor or Teachers constitute the first part of the fact) as factors. For the sports profession we adopted the typical attribute of Experiment 1 (ambition). The political items compared Professors with Teachers on either being liberal or conservative[3].

Two dependent variables were used. The first reflected the degree to which the explanation focused on one or the other option on an 11-point scale with each end representing one of the two comparison groups. The second measured the overall focus in the explanation as a forced choice.

Materials Participants were asked to provide an explanation for one particular fact. The fact was again presented as a finding of a large-scale study from a renowned research institute. Each fact was either about a gender difference in sports professions (Football or Ballet) or a difference in political attitude (being liberal or conservative) between teachers and professors. As in Experiment 1 each fact could take one of four forms depending on the Position (which group constituted the first part of the fact) and the Frame ('more … than' or 'less … than'). The position of the two comparison groups on the rating scale and the forced choice options were counterbalanced. The items for Sports were therefore identical to those from Study 1.

[3] Note that for the political item people were asked to explain a difference between teachers and professors rather than between genders.

Procedure The study was conducted as part of a series of studies. Participants took part in groups of 25 and required no more than 3 minutes to complete the questionnaire. Each participant provided one explanation for a comparative fact and subsequently rated that explanation for the degree to which the explanation focused on one or the other component of the fact. In addition, participants gave an overall judgment of their focus in their explanation.

Results

Influence of Gender First we looked at the effect of gender stereotyping on the focus in explanations in the sports profession items in order to validate the procedure of Experiment 2. Overall only 39% of explanations regarding a gender difference among ballet dancers focused on women whereas for football players it was 53% ($\chi^2(1, N = 193) = 3.96$, $p < .05$). Thus the data for sports professions replicated the influence of gender stereotyping on who received most attention in explanations.

Influence of Position & Frame In order to test the influence of Position and Frame on the overall judgment of focus, a 2 × 2 × 2 × 2 × 2 hierarchical loglinear analysis was carried out with Item topic (Sports vs. Politics), Item (Male/Professor vs. Female/Teacher), Position (e.g., Professor-First vs. Teacher-First) and Frame (more vs. less) as independent variables. As in Experiment 1, we found an overall preference to explain the first part of the fact (65% of people; $\chi^2(1, N = 374) = 32.4$, $p < .001$). This bias was again moderated by the way the attribute was framed with 81% focusing on the first part when it was framed as 'more ... than' and only 49% focusing on the first when it was framed as 'less ... than' ($\chi^2(1, N = 374) = 41.2$, $p < .001$). Figure 3 illustrates that this moderating effect on the bias was not equally strong for all items. Similar to the neutral items in Experiment 1, the moderating effect of the Frame was smaller for explanations about why professors and teachers have different levels of conservatism. This was reflected in a significant interaction between Item topic, Item and Frame on the proportion of people focusing on the first part of the explanation ($\chi^2(1, N = 374) = 4.7$, $p < .05$).

The dependent measure reflecting the degree to which an explanation focused on one or the other group matched the forced choice option. The degree to which people focused on the first part of the explanation was significantly above the mid point of the scale on a one-sample t-test ($M = 5.9$, $SD = 3.1$, $t(373) = 5.9$, $p < .001$). An Analysis of Variance (ANOVA) with the degree of focus on the first part as dependent variable and Item topic, Item, Position and Frame as between-subjects factors revealed a significant main effect of Frame ($F(1, 358) = 22.1$, $p < .001$) reflecting the moderating effect of Frame on the bias towards focusing on the first part of the fact. [4]

[4] None of the effects reported here were influenced by the participants' gender.

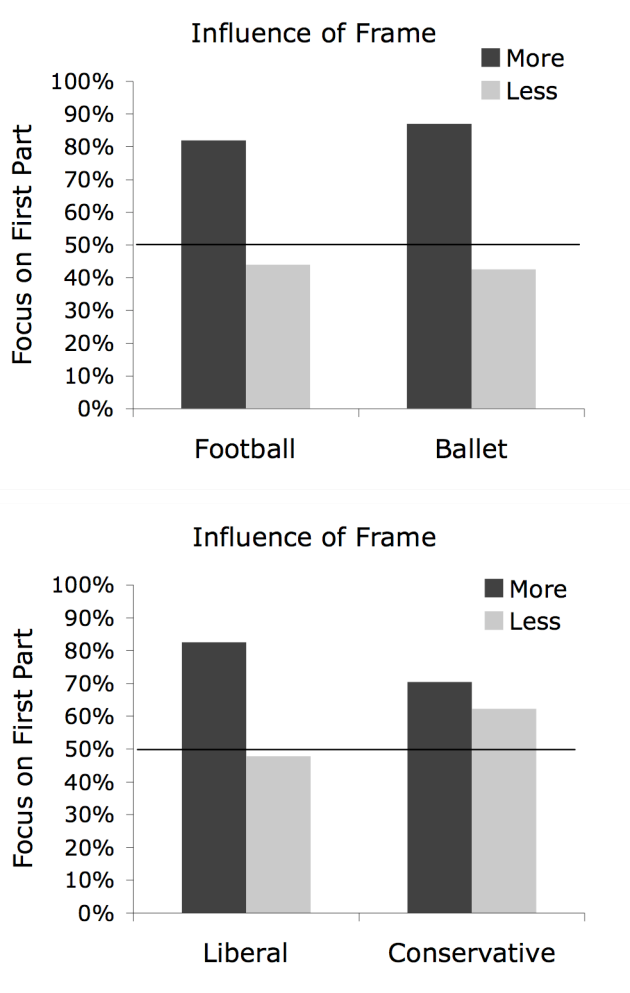

Figure 3: The interaction between Item topic, Item and Frame on the focus of explanations.

Discussion

Experiment 2 replicated the effect of gender stereotyping in the sports profession items and thereby validated the change in procedure. Using external judges or asking participants to do their own coding did not affect the results. The data also replicated the influence of Position and Frame on the focus of the explanations. People again focused more on the first part of the comparative fact, which was moderated by the way the attribute was framed. This moderating effect however was only present in the sports profession items and the liberal attribute of the political items. Although the data showed a similar pattern for the conservative attribute, the moderating effect of Frame was not significant.

Although being liberal or conservative were assumed to be roughly of the same valence, the data for the conservative attribute behaved in a similar way as the neutral items in Experiment 1. In a sample of 29 students from the Catholic University of Leuven, the majority judged being liberal as a positive (19/29) whereas being conservative a neutral (18/29) characteristic. Thus people avoided focusing on the

negatively framed attribute for the target group and rather explained the positive characteristic of the comparison group. In contrast participants did not avoid focusing on the 'less … than' frame when the attribute was more neutral.

Experiment 2 therefore provides additional evidence that the shift in focus occurs for positively valenced rather than neutral attributes. In hindsight, however, our data do not entirely rule out the influence of the typicality of the attribute for the group. Participants may well perceive being liberal as a more typical attribute for Professors and Elementary school teachers. This possibility will have to be addressed in future studies.

General Discussion

Facts are often presented in relative terms by comparing one case with another. This helps both in evaluating the fact (Laming, 1984; Stewart et al., 2005) and in finding possible explanations for the fact (Lipton, 2004). Presenting a fact in a comparative manner offers at least two ways to present the fact. We can, for instance, present the financial crisis in Britain as more severe than in the rest of Europe or we can present the financial crisis in Europe as less severe than that in Britain. Our results suggest that these two ways of presenting the same fact changes what people focus on in their explanation and hence changes their explanation.

The Principle of Lexical Marking (Clark, 1969) may provide an explanation for the shift in focus. This principle suggests that for pairs of adjectival terms (high-low, bright-dim, etc.) one of the terms is represented in a less complex form in our semantic memory than the other. The so-called unmarked term is the one that defines the scale (e.g., height, brightness). It is also noncommittal. Asking 'how high is the bridge?' leaves open whether the bridge is high or low, whereas 'how low is it?' implies that it is low. In a comparative question like 'Why was Obama less popular with evangelical Christian voters than McCain', people might focus more on McCain being more popular because 'being popular' is the unmarked term on a popularity scale. If 'being less' popular is represented in a more complex form, takes longer to process (Clark, 1969) and may therefore be more difficult to explain, it is understandable that people would think about the flipside of the coin and explain the greater popularity of McCain. If lexical marking was the complete story though, one might expect the shift in focus not to be restricted to positively valenced attributes.

Although loss aversion (Kahneman & Tversky, 1979) is mainly a theory about subjective utility, it may be useful in thinking about why this effect seems to be restricted to valenced attributes. Negative events appear to mobilize physiological, affective, cognitive, and certain types of social resources to a greater degree than do positive or neutral events (Kusev et al., 2008). For a negatively presented difference, participants might therefore not restrict their efforts to providing an explanation for the target group, but also consider the comparison group. This would explain the differential effect of neutral and positive attributes on the shift in focus.

Previous research has suggested several factors that may influence what we focus on in our explanation (Grier & McGill, 2000; Hegarty & Pratto, 2001; Miller et al., 1991). Here we have shown that over and above those influences, there are also influences on the more fundamental level of presentation. Future research will have to scrutinize possible theories—including lexical marking and loss aversion—that can account for this shift in focus. Here we have provided a first demonstration of this effect in the realm of explanations.

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