

## Changing False Beliefs from Repeated Advertising: The Role of Claim-Refutation Alignment

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This research addresses refutation of false beliefs formed on the basis of repeated exposure to advertisements. Experiment 1 explores belief in the refutation as a function of the perceptual details shared (alignment) between the claim and the refutation as manipulated by whether the original claim was direct (assertion) or indirect (implication). Experiment 2 then examines whether this effect will carry through to belief in the original claim after exposure to the refutation. Findings indicate that direct refutations of indirect claims are believed more than refutations of direct claims. However, direct refutations of direct claims are more effective in reducing belief in the original claim. We argue that recollection of the original claim facilitates automatic updating of belief in that claim. Experiment 3 demonstrates that an alternative cue (a logo) in a refutation that facilitates recall of the original claim enables reduction of belief in the original indirect claim; this finding helps to pin down the mechanism—recall of the original claim—underlying belief updating. Further, Experiment 3 finds that multiple cues to recalling the original claim may prevent the automatic updating process. Theoretical and practical implications are discussed.

For several years, Splenda has advertised that Splenda is “made from sugar, so it tastes like sugar.” The implication is that Splenda is as natural as sugar. This claim has become credible due to the simple fact that the claim has been seen repeatedly. Repeating a claim increases its familiarity and this familiarity subsequently enhances belief in the claim (Hawkins & Hoch, 1992). Yet, despite the fact that consumers believe it, the claim is alleged to be false. Both Equal and the Sugar Association claim that Splenda is misleading consumers into believing that Splenda is as natural as sugar when in fact it is a chlorine-containing hydrocarbon and is not natural. In an attempt to thwart the false belief, the Sugar Association is advertising that “Splenda is not natural and does not taste like sugar” (Walker, 2005).

The question explored in this research is how effective are such refutations against claims that have been made

repeatedly and are believed to be true by customers? Correcting false beliefs created by advertisements is not easy. Disclaimers and disclosures are often ineffective (Johar & Simmons, 2000), and even corrective advertising may not reduce false beliefs (Johar, 1996). Directly refuting the claim may also not work. In fact, consumers generally believe contradictions of the original claim less than the original claim itself (Bacon, 1979; Brown & Nix, 1996).

In this research we investigate how the format of a refutation impacts belief in both the refutation and in the original claim. More specifically, we investigate whether refutations should be aligned in format to the original claim (e.g., the Splenda refutation) or they should be distinct in format to most effectively change beliefs. As explained in greater detail below, direct refutations of indirect claims (implied claims) will not be aligned with the original claim and are expected to be believed more than direct refutations of direct claims (assertions) which are aligned with the original claim. Yet refutations of direct claims are expected to be more effective in reducing belief in the original claim. This is because alignment between the refutation and the original claim is expected to increase recall of the original claim and enable updating of the original claim. However, if

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the alignment between the refutation and the original claim is too strong, the refutation may not be effective in reducing belief in the original. This is because high perceptual similarity between the original claim and the refutation may prevent processing of the actual meaning of the refutation.

This investigation can provide both theoretical and practical insights. From a theoretical viewpoint, this research can help pin down the role of alignment and claim recall in causing consumers to update beliefs. From a practical standpoint, the findings can help inform policy on how to best counter false advertising claims. The next section presents our theoretical framework. Experiment 1 then explores the impact of claim-refutation alignability (in terms of whether the original claim was directly or indirectly stated) on belief in the refutation. Experiment 2 examines whether this effect will carry through to belief in the original claim. Experiment 3 pins down the underlying mechanism and also explores the impact of multiple alignability cues on belief in both the refutation and the original claim.

## CONCEPTUAL BACKGROUND

It is well known that repeated exposure to ambiguous statements (statements that could be judged as either true or false) enhances the rated truth of these statements compared to a single exposure (e.g., Arkes, Boehm, & Xu, 1991; Bacon, 1979; Hasher, Goldstein, & Toppino, 1977). Less understood is how prior exposure to a claim impacts belief in a refutation of the claim. Refutations or contradictory statements are claims that directly state the opposite of a previously understood conclusion. The refutation may be perceptually similar to the original claim when the original claim is direct (asserted); in this case, the refutation would be alignable with the original claim. In contrast, the refutation may share few perceptual details with the original claim and therefore be less alignable with the original claim. An example of low alignability would be a case where the original claim is an implication (i.e., the conclusion is never stated outright) and the refutation is a contradiction of the implied conclusion. Refutations could also be alignable in terms of containing perceptual elements (e.g., a logo) that are similar to the original claim. The goal of this research is to determine whether there is a difference in the effectiveness of refutations based on alignment of the refutation with the original claim.

### Alignment

Alignment is typically discussed in relation to the comparison of alternatives on different attributes (e.g., Medin, Goldstone, & Markman, 1995; Zhang & Markman, 1998). These studies indicate that mental comparisons between objects (e.g., two brands of cars) invoke three types of relationships: (1) commonalities (e.g., Cars A and B are both Japanese); (2) alignable differences (Car A gives 25 mpg

and Car B gives 30 mpg); and (3) nonalignable differences, which pertain to unique features of the objects (e.g., Car A has driver's side airbags and Car B has a power-operated roof). Pham and Muthukrishnan (2002) applied the notion of alignability to examine attitude change and found that this same mental comparison also takes place when information that challenges a previously established evaluation is presented (e.g., Car A does not provide a smooth ride challenges the evaluation that Car A is a luxury car). They argue that challenges commensurable with prior information are alignable and challenges that lack commensurability are non-alignable. Their results demonstrate that new information is more likely to have an influence on judgments when it is alignable with the initial information.

In this research, we are interested in how refutations of advertising claims affect consumer beliefs (rather than judgments or evaluations). Refutations are always assumed to be direct negations. We argue that the format of the refutation in relation to the original claim creates conditions in which the refutation is either more or less aligned with the original claim. We refer to a refutation that directly contradicts an original direct claim as an aligned refutation. "Avis does not offer collision damage insurance" is aligned with the direct claim that "Avis offers collision damage insurance." The wording is identical except for the negation of the claim.

In contrast, we refer to a refutation that states that the previously understood conclusion is false, but is not aligned with the format of the original claim as a nonaligned refutation. To better understand this notion, consider an implied claim. Implied claims are those that do not provide complete information but require the perceiver to draw conclusions from the given information on the basis of rules that associate the information to the conclusions in a subjectively logical fashion (Hastie, 1983; Kardes, 1988b). In the case of omitted conclusions, there are two claims which logically imply a third claim that is left unstated (Kardes, 1988a; Sawyer & Howard, 1991; Stayman & Kardes, 1992). For the omitted conclusion, "All car rental companies offer collision-damage insurance payments. Avis is a car rental company," the refutation is "Avis does not offer collision damage insurance." This refutation is not aligned because it is different in format from the original claim; it refutes a claim that was never stated, only implied.

### Belief in the Refutation

What is the better way to refute a claim—with a refutation that is aligned or one that is not aligned with the original claim? As has been shown repeatedly, statements that feel familiar are judged to be truer than statements that do not feel familiar (e.g., Begg, Anas, & Farinacci, 1992; Hawkins & Hoch, 1992; Law, Hawkins, & Craik, 1998; Roggeveen & Johar, 2002). This logic would lead to the argument that refutations that are aligned will feel more familiar and hence be believed more than nonaligned refutations. Yet,

alignment may help consumers to retrieve the original claim from memory. Previous research has demonstrated that contradictions are rated as more false than new statements only when the original claim is accessible and retrieved from memory at the time of processing the contradiction. Bacon (1979) found that contradictions were rated more false than new statements only when subjects knew there were changes to previously seen statements. Gilbert, Krull, and Malone (1990) found that contradictions were only rated as more false if consumers engage in an effort-dependent mechanism in which they attach a false "tag" to the representation. And, Begg and Armour (1991) found that contradictions were rated more false than new statements only when the original claim was remembered in detail. Retrieval of the original claim results in defensive processing of the refutation, and hence lowers belief in the refutation. This logic would argue that seeing a refutation will set in motion a recollection process, and a refutation that is aligned with the original claim is more likely to cue the original claim in memory. This would result in aligned refutations being believed less than nonaligned refutations. These competing hypotheses are tested in Experiment 1 using assertions (direct claims) and implications (indirect claims) to manipulate the format of the original claim; the refutation is always direct. Taken together, this creates conditions where the refutation is aligned vs. nonaligned.

## EXPERIMENT 1

In addition to testing belief in refutation, this experiment also tests belief in conclusions in order to ensure equal beliefs between asserted and implied claims.

### Method

Participants were shown ambiguous statements about consumer products during three different sessions. Sessions one

and two served as exposure phases allowing us to create different levels of repetition of the claims seen during the test phase, that is session three. During the exposure phases, one third of the subjects saw only filler claims, meaning that when the claims were seen during the test phase they were "new." Another one third of the subjects saw implications where a conclusion about a brand had to be inferred from two other claims, and the other one third saw assertions where the same conclusion about the brand was simply stated. Finally, during the test phase, half the claims seen were assertions and half were refutations. For those that had seen an implication during the exposure phases, the assertion or refutation seen in the test phase was not aligned with the initial exposure. For example, "Avis offers collision damage insurance" is the conclusion of the implication "All car rental companies offer collision damage insurance. Avis is a car rental company." The refutation of an implication was the opposite of the implied meaning (e.g., "Avis does not offer collision damage insurance"). In both cases, the assertion/refutation seen during the test phase is not aligned with the original claim.

For those who had seen an assertion during the exposure phases, the assertion or refutation seen in the test phase was aligned with the initial exposure. For example, everyone in those conditions saw that "Avis offers collision damage insurance" during the exposure phase. They saw that same assertion during the test phase for assertions, and saw "Avis does not offer collision damage insurance" during the test phase for refutations. In both the cases, the assertion/refutation seen during the test phase was aligned with the original claim. In total, there were six different conditions created (see Table 1).

### Subjects and Design

Subjects were 90 undergraduate and graduate students who were paid \$8 each for their participation. The experiment used a 3 × 2 between-subjects design. The factors consisted of item repetition (new: one exposure as an assertion/refutation

TABLE 1  
Experiment 1 Stimuli

<i>Type of Claim Shown During Test Phase</i>	<i>Repetition and Alignment Status of Claims Shown During Test Phase</i>	<i>Specific Claims Seen During Exposure phases (Sessions One and Two)</i>	<i>Specific Claims Seen During Test Phase (Session Three)</i>
Conclusion	New (not seen in exposure phase)	20 fillers	4 assertions 36 fillers
	Repeated not aligned (seen in exposure phase as indirect claim)	4 implications 16 fillers	4 assertions 36 fillers
	Repeated aligned (seen in exposure phase as direct claim)	4 assertions 16 filler	4 assertions 36 fillers
	Refutation	New (not seen in exposure phase)	20 fillers
Refutation	Repeated not aligned (seen in exposure phase as indirect claim)	4 implications 16 fillers	4 refutations 36 fillers
	Repeated aligned (seen in exposure phase as direct claim)	4 assertions 16 filler	4 refutations 36 fillers

vs. indirect: two exposures as an implication followed by one exposure as an assertion/refutation vs. direct: two exposures as an assertion followed by one exposure as an assertion/refutation) and test claim type (assertion vs. refutation).

### Stimuli

Pairs (one assertion and one implication) of product claims were selected to ensure equivalent meaning for implied and asserted claims. The claims were based on stimuli used by Law (1998). Twenty statements were pretested to determine if the externally provided conclusion (the assertion) and the internally generated conclusion (the implied conclusion of an implication) conveyed the same meaning. For example, "Avis offers collision damage insurance" (an assertion) and "All car rental companies offer collision damage insurance. Avis is a car rental company" (an implication) were tested to determine if they conveyed the same meaning. Thirty participants were shown pairs of claims and asked if the meaning of the assertion and the implication were the same or different. If participants answered that they were different, they were then asked to briefly describe the difference.

Pairs of statements that 60% or more of participants interpreted to mean the same were reviewed. On the basis of the descriptions of those who interpreted the meaning to be different, statements were edited to ensure the equality of meaning between the implication and the assertion forms. The end result was four pairs of statements (one implication and one assertion) that participants interpreted to mean the same thing (see Appendix A).

### Procedure

Six sets were created to counterbalance when statements were presented as assertions vs. refutations and whether they were presented as new, assertions/refutations of indirect claims or assertions/refutations of direct claims. The sets created are represented in Table 1.

This arrangement resulted in the subject viewing 20 statements in sessions one and two and 40 statements in session three. Each set was presented to 14–15 subjects. Subjects participated in three sessions separated by unrelated tasks that lasted 5 min each. The experiment, which took place in a classroom, lasted approximately 30 min. In all sessions, subjects were specifically told to think about what the claim meant. This was done to increase involvement and ensure that subjects would internally generate the conclusions for the implications.

At the onset of the first session, subjects were given a packet with a coversheet explaining that the researchers were interested in the clarity and effectiveness of advertising claims appearing in a variety of media in the United States and Canada. They were then told that the researchers would like their opinions on how understandable the claims were. Furthermore, they were informed that they would

have 10 sec to read the claim and indicate how easy or difficult the claim was to understand (on a seven-point scale). The experimenter then paced the subjects through the packet indicating when they should turn to the next page. Each page of the packet contained one claim. There were 20 items in total.

After the distracter task, subjects were presented with a second packet consisting of a cover sheet followed by the same 20 items. The items were ordered differently, and subjects were told that again the researchers were interested in the clarity and effectiveness of claims appearing in a variety of media. They were then told that the researchers would like their opinion on the clarity of the meaning of the claims. Again, subjects were told they have 10 sec to read the claim and indicate the clarity of the claim (on a seven-point scale). The experimenter again paced them through the packet.

After a second distracter task, subjects were presented with a packet consisting of a coversheet followed by 40 randomly ordered statements. The coversheet explained that the purpose of the study was to gather consumer opinions of specific claims used in advertising. They were informed that they had seen some of the claims in the previous studies and others were new. They were also told that some of the claims were true and others were false. Finally, they were informed that they would have 15 sec to read the claim and indicate their opinion about the truth of the claim on a seven-point scale (from 1 = definitely false to 7 = definitely true), how familiar the claim felt (from 1 = very unfamiliar to 7 = very familiar), and whether the opposite of the claim had been seen in a previous study (from 1 = definitely disagree to 7 = definitely agree). The researcher then paced the subjects through the packet indicating when they should turn to the next page.

### Results

Mean familiarity, recall of seeing the opposite, and truth ratings are in Table 2.

### Manipulation Checks

To ensure that participants perceived the repetition of statements, an ANOVA was done on familiarity. Results revealed a significant main effect of item repetition ( $F(2, 84) = 38.92, p < .001$ ) such that for both assertions and refutations, familiarity in the direct claim condition was greater than familiarity in the indirect claim condition ( $p$ 's  $< .05$ ) and both were greater than familiarity with the items seen only once ( $p$ 's  $< .05$ ).

Importantly, the ANOVA on recall of seeing the opposite claim revealed a significant interaction ( $F(2, 84) = 33.80, p < .001$ ). As expected, those who were tested with assertions in session three did not recall seeing the opposite. For refutations, recollection of seeing the opposite was

TABLE 2  
Experiment 1 Results: Means in The Assertion or Refutation Conditions in Session Three

	Tested Claim	Condition		
		New	Repeated Nonaligned (Indirect Claim Seen During Exposure Phases)	Repeated Aligned (Direct Claim Seen During Exposure Phases)
Mean familiarity	Assertion	2.62	5.31	6.48
	Refutation	2.41	3.41	4.57
Mean recall of opposite	Assertion	1.40	1.63	1.12
	Refutation	1.62	4.72	5.88
Mean truth	Assertion	4.48	5.18	5.77
	Refutation	3.64	3.39	2.43

Note: Refutation is always in assertion form (i.e., a contradiction of the assertion claim). All ratings are on seven-point scale with higher numbers indicating higher levels of familiarity, recall, or truth.

greater when the refutation was of a direct claim than when it was of an indirect claim ( $M_{\text{direct}} = 5.88$ ,  $M_{\text{indirect}} = 4.72$ ,  $F(2, 84) = 8.69$ ,  $p < .01$ ). Both were greater than when the claim was new ( $M_{\text{direct}} = 5.88$ ,  $M_{\text{new}} = 1.62$ ,  $F(2, 84) = 116.27$ ,  $p < .001$ ;  $M_{\text{indirect}} = 4.72$ ,  $M_{\text{new}} = 1.62$ ,  $F(2, 84) = 61.4$ ,  $p < .001$ ). These results support the idea that a refutation of a direct claim is a stronger cue to the original claim in memory than a refutation of an indirect claim.

### Belief

The ANOVA using item repetition (new vs. indirect vs. direct) and claim type (assertion vs. refutation) as the independent variables revealed a significant main effect of claim type ( $M_{\text{assertion}} = 5.14$ ,  $M_{\text{refutation}} = 3.16$ ,  $F(1, 84) = 100.13$ ,  $p < .001$ ). Assertions are given higher truth ratings than refutations. This result is similar to Hawkins and Hoch's (1992) finding that there is a greater truth effect for positively worded statements compared to negatively worded ones.

Importantly, the interaction was also significant ( $F(2, 84) = 13.32$ ,  $p < .001$ ). Follow-up contrasts reveal that for assertions, there was a significant difference between new claims and claims that were originally indirect ( $M_{\text{new}} = 4.48$ ,  $M_{\text{indirect}} = 5.18$ ,  $F(1, 84) = 4.13$ ,  $p < .05$ ), and between new claims and claims that were originally direct ( $M_{\text{new}} = 4.48$ ,  $M_{\text{direct}} = 5.77$ ,  $F(1, 84) = 13.90$ ,  $p < .001$ ). This replicates the basic truth effect finding of increases in belief with repetition. There was no significant difference in the increase in truth-value due to repetition for claims which were originally direct or indirect.

For refutations, there was a significant difference between refutations of claims which were originally direct vs. indirect ( $M_{\text{indirect}} = 3.39$ ,  $M_{\text{direct}} = 2.43$ ,  $F(1, 84) = 7.79$ ,  $p < .01$ ), and between claims which were originally direct and new claims ( $M_{\text{new}} = 3.64$ ,  $M_{\text{direct}} = 2.43$ ,  $F(1, 84) = 12.26$ ,  $p < .001$ ). Refutations of claims which were originally direct were believed less than refutations of claims which were originally indirect and also less than new claims. There was no significant difference between

refutations of claims which were originally indirect and new claims ( $M_{\text{new}} = 3.64$ ,  $M_{\text{indirect}} = 3.39$ ,  $p > .4$ ), indicating that participants believed a refutation of an indirect claim as much as if they had never seen the original claim.

### Mediation Analysis

Mediation analyses were conducted to examine the mechanisms underlying these effects. Consistent with prior literature, the analysis confirms that familiarity completely mediates the effect of repetition on belief for both claims which were originally indirect and direct. See Figure 1 for details.

Consistent with the ANOVA results, the regression results show that belief in refutations of claims that were originally indirect are not impacted by exposure to the original claim ( $\beta = -.087$ ,  $p > .3$ ). However, belief in refutations of claims that were originally direct are impacted by exposure to the original claim ( $\beta = -.369$ ,  $p < .001$ ). Further, a higher level of recall of having seen the opposite claim predicts a weaker belief in the refutation ( $\beta = -.428$ ,  $p < .001$ ). Finally, when both exposure to the original claim and recollection of seeing the opposite are included in the model, only recollection is a significant predictor of belief

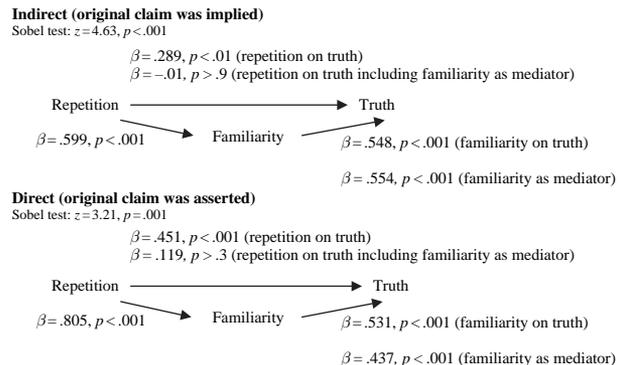


FIGURE 1 Experiment 1 assertion mediation results.

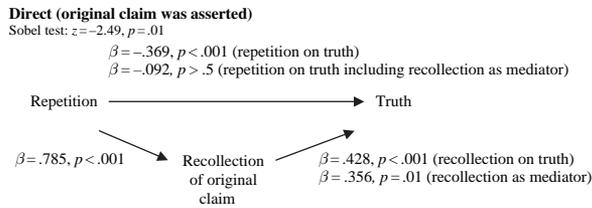


FIGURE 2 Experiment 1 refutation mediation results.

( $\beta = -.356, p = .01$ ). A Sobel test also confirms this mediation ( $z = -2.49, p = .01$ ). Thus, in the case of refutations of direct claims, recollection of having seen the opposite mediates the impact of prior exposure to the original claim on belief in the refutation. See Figure 2 for details.

## Discussion

These findings support the hypothesis that refutations aligned with the original claim (e.g., original claim was a direct assertion) are believed less than refutations that are not aligned with the original claim (e.g., original claim was indirect, i.e., an implication). Mediation results are consistent with the posited underlying process. Refutations that are aligned with the original claim cue stronger recall of the original claim and this recall decreases belief in the refutation itself. When the refutation is not aligned with the original claim it does not cue the original claim and the refutation is believed as much as if the original claim had never been seen.

This experiment also ruled out the alternative explanation that repeated exposure impacts belief differently for direct and indirect claims. Belief in the assertion was equally high regardless of whether the assertion was direct (aligned with the original claim) or indirect (not aligned with original claim). What this experiment does not answer, however, is how these refutations impact belief in the original claim. Experiment 2 is designed to explore this issue.

## EXPERIMENT 2

Experiment 1 demonstrated that belief in refutations of direct claims (refutations aligned with the original claim) is lower than belief in refutations of indirect claims (refutations not aligned with the original claim). But will this effect carry through to belief in the original claim after exposure to a refutation?

Pham and Muthukrishnan (2002) found that when there is a lack of commensurability between two sets of information, the evaluative implication of the challenging information is obscured. But when there is commensurability between the two sets of information, the challenging information causes greater judgment revision of the original information. This would imply that when a refutation is not

aligned with a claim, the refutation is unlikely to impact belief in the original claim. On the other hand, aligned refutations are more likely to reduce belief in the original claim. This reasoning leads to the hypothesis that belief in the original claim will be lower after exposure to refutations of direct claims (i.e., refutation is aligned) vs. indirect claims (i.e., refutation is not aligned). We base this hypothesis on the idea that an alignable refutation will cue the original claim in memory (as found in Experiment 1) and enable updating. This finding suggests that belief in the refutation does not mediate the belief in the original claim; rather, updating occurs when the original and refutation claims are alignable despite lower belief in the refutation.

## Method

Subjects were 89 undergraduate and graduate students who were paid \$8 for their participation. The experiment used a  $3 \times 2$  between-subjects design which manipulated claim repetition (new: one exposure as an assertion in session four vs. indirect: two exposures as an implication in sessions one and two, one exposure as an assertion in session four vs. direct: three exposures as an assertion in sessions one, two, and four) and refutation (seen vs. not seen in session three). The basic experimental procedure was nearly identical to Experiment 1. The key difference was that there were four sessions. In session three half the subjects saw refutations and half did not. During session four, the test phase, all statements were in assertion form and only belief was measured. Six sets were created to counterbalance the conditions. The sets created are represented in Table 3.

## Results

Mean truth ratings are given in Table 4.

Analyses involved a series of planned comparisons. Refutations of indirect claims did not impact belief in the original claim. Participants believed the original claim as the same regardless of whether a refutation had been seen or not ( $M_{\text{no refutation}} = 5.40, M_{\text{refutation}} = 5.23, F < 1$ ). In contrast, refutations of direct claims did impact belief in the claim. Participants believed the original claim less when a refutation was seen ( $M_{\text{no refutation}} = 5.53, M_{\text{refutation}} = 4.95, F(1, 83) = 2.80, p < .05$  one-tailed). Thus, refutations of direct claims cause a greater change in belief in the original claim than refutations of indirect claims (even though Experiment 1 found that refutations of direct claims are less likely to be believed). Participants who saw a refutation of a direct claim believed the original claim to the same extent as those who first saw the original claim in the test phase ( $M_{\text{new}} = 4.75, M_{\text{direct}} = 4.95, F < 1$ ). The refutation was therefore successful in bringing beliefs down to the same level as beliefs without repeated exposure to the original claim. Participants who saw a refutation of an indirect claim believed the conclusion of the implication more than those

TABLE 3  
Experiment 2 Stimuli

<i>Refutation Seen or Not Seen During Session Three Exposure</i>	<i>Repetition and Alignment Status of Claims Shown During Test Phase</i>	<i>Claims Seen During Exposure Phase (Sessions One and Two)</i>	<i>Claims Seen During Exposure Phase (Session Three)</i>	<i>Claims Seen During Test Phase (Session Four)</i>
Refutation	New (not seen in exposure phases)	20 fillers	4 refutations 16 fillers	4 assertions 36 fillers
	Repeated not aligned (seen as indirect claim during exposure phases)	4 implications 16 fillers	4 refutations 16 fillers	4 assertions 36 fillers
	Repeated aligned (seen as direct claim during exposure phases)	4 assertions 16 fillers	4 refutations 16 fillers	4 assertions 36 fillers
No refutation	New (not seen in exposure phases)	20 fillers	20 fillers	4 assertions 36 fillers
	Repeated not aligned (seen as indirect claim during exposure phases)	4 implications 16 fillers	20 fillers	4 assertions 36 fillers
	Repeated aligned (seen as direct claim during exposure phases)	4 assertions 16 filler	20 fillers	4 assertions 36 fillers

TABLE 4  
Experiment 2 Results: Mean Truth Ratings in the Original Claim by Condition

		<i>New</i>	<i>Repeated Nonaligned (Indirect Claim Seen During Exposure Phases 1–2)</i>	<i>Repeated Aligned (Direct Claim seen During Exposure Phases 1–2)</i>
Mean truth	Refutation in session three	4.75	5.23	4.95
	No refutation (filler in session three)	4.62	5.40	5.53

Note: All ratings are on seven-point scale where higher numbers indicate greater levels of belief in the original claim.

who had never seen the implied claim (but had seen the refutation) ( $M_{\text{new}} = 4.75$ ,  $M_{\text{indirect}} = 5.23$ ), although this contrast did not reach conventional levels of significance. Thus, refutations of direct claims disrupt the enhancement in belief due to repetition, whereas refutations of indirect claims do not.

### EXPERIMENT 3

The previous two experiments focused on alignment in terms of the claim type (direct vs. indirect) and suggested that aligned refutations cue recall of the original claim and, hence, enable updating. If the posited recall process is correct then any cue in the refutation that facilitates recall of the original claim should have the same effect. This experiment examines one such cue, the use of a logo in the original vs. refutation claim, to provide further evidence of the posited recall process. For example, a claim may contain a logo, and the refutation may also contain the same logo (claim-refutation aligned) or the refutation may not include the logo (not aligned). The purpose of Experiment 3 is to

pin down the mediating effect of original claim recall by showing that an alternate claim-refutation alignability cue (logo) can reduce belief in the original claim to the same extent as the claim format was shown to do in Experiment 2. Additionally, this experiment explores how multiple alignability cues impact consumers' belief in the original claim. When a refutation is strongly aligned with the original claim (e.g., aligned both in terms of claim type and logo vs. aligned along one cue), we expect that the refutation may be less effective in reducing belief in the original claim. This is because a strongly aligned refutation may cause participants to judge the claim on its perceptual familiarity rather than processing the meaning of the refutation. In fact, consumers may not even recognize that the strongly aligned refutation is the opposite of the original claim. Thus, belief in the original claim is unlikely to be reduced by the strongly aligned refutation.

We focus on the claim format (as in Experiments 1 and 2) and on whether a logo was included on both the claim and the refutation, or only on the claim and not the refutation. The explicit manipulation of these two factors creates strongly aligned and less strongly aligned conditions. When both the refutation format and the logo align with the

original claim, the refutation is strongly aligned (direct original claim with logo-refutation with logo). When either the refutation format or the logo (but not both) are aligned with the original claim, the refutation is less strongly aligned (direct original claim with logo -refutation with no logo or indirect original claim with logo -refutation with logo).

**Method**

Subjects were 39 undergraduate and graduate students who were paid \$12 for their participation. The experiment manipulated the alignment of the refutation in two ways. One manipulation of alignment was similar to Experiments 1 and 2, where alignment was manipulated by claim format (indirect: two exposures as an implication in sessions one and two, one exposure as a refutation in session three, and one exposure as an assertion in session four vs. direct: three exposures as assertion in sessions one, two, and four, and one exposure as a refutation in session three). The second manipulation of alignment involved whether a logo was shown with the claims and the refutation (aligned) or only with the claim (not aligned). Three conditions were then created, two that were less strongly aligned (indirect original claim with logo—refutation with logo; direct claim with logo—refutation with no logo), and one that was strongly aligned (direct claim with logo—refutation with logo). The logo used was a pack-shot of the brand or simply the brand name shown in color in addition to the claim itself.

The basic experimental procedure was similar to Experiment 2. The key differences were that in session three, all subjects saw refutations and belief in the refutation was measured. In sessions one, two, and four, all original claims were shown with brand logos. In session three, some of the refutations had the brand logo and some did not. When no logo was shown with the refutation, this created the logo nonalignment condition. When a logo was shown with the refutation, this created the logo alignment condition. Similar to Experiment 2, the refutation always directly contradicted the assertion, thus creating a claim alignment condition when the claim was originally asserted and a claim non-alignment condition when the claim was originally implied. During session four, all statements were in assertion form and belief in the original claim, as well as confidence in this belief, was measured. Each session contained 18 claims, 4 test claims, and 14 filler claims. Three sets were created to counterbalance the conditions. The conditions created are represented in Table 5.

**Results**

Mean ratings are given in Table 6.

Findings indicate that including the logo on the refutation of an indirect claim (an alternative method of aligning the refutation with the original claim) was as effective as

**TABLE 5**  
Experiment 3 Stimuli

<i>Alignment</i>	<i>Sessions One and Two (Exposure Phase)</i>	<i>Session Three (Refutation Belief)</i>	<i>Session Four (Original Claim Belief)</i>
Less strongly aligned (indirect original claim with logo—refutation with logo)	4 implications with logo 14 fillers	4 refutations with logo 14 fillers	4 assertions with logo 14 fillers
Less strongly aligned (direct original claim with logo—refutation with no logo)	4 assertions (matched to implications) with logo 14 fillers	4 refutations (no logo) 14 fillers	4 assertions with logo 14 fillers
Strongly aligned (direct original claim with logo—refutation with logo)	4 assertions (matched to implications) with logo 14 filler	4 refutations with logo 14 fillers	4 assertions with logo 14 fillers

*Note:* Participants were randomly assigned to one of the three rows.

**TABLE 6**  
Experiment 3 Results: Mean Truth Ratings in Original Claim by Condition

<i>Claim Alignment</i>	<i>Belief in Original (Session Four)</i>	<i>Belief in Refutation (Session Three)</i>	<i>Recall in Seeing Opposite (Session Four)</i>
Less strongly aligned (indirect original claim—refutation with logo)	4.87	3.23	4.98
Less strongly aligned (direct original claim—refutation with no logo)	4.85	3.00	4.89
Strongly aligned (direct original claim—refutation with logo)	5.72	3.77	4.00

*Note:* All ratings are on seven-point scale where higher numbers indicate greater levels of belief or stronger recall.

refuting a direct claim (as shown in Experiment 2). Belief in the original claim was equivalent across the two conditions ( $M_{\text{less strongly aligned (indirect, logo)}} = 4.87, M_{\text{less strongly aligned (direct, no logo)}} = 4.85, F < 1$ ). As expected, when the refutation was strongly aligned (logo on the refutation of a direct claim), belief in the original claim was not reduced to the same extent as when the refutation was less strongly aligned ( $M_{\text{strongly aligned (direct, logo)}} = 5.72, M_{\text{less strongly aligned (indirect, logo)}} = 4.87, F(1, 36) = 3.61, p < .05, \text{one-tailed}; M_{\text{strongly aligned (direct, logo)}} = 5.72, M_{\text{less strongly aligned (direct, no logo)}} = 4.85, F(1, 36) = 3.77,$

$p < .05$ , one-tailed). Even though they failed to update their prior beliefs, participants in the strongly aligned refutation condition were no less confident than those in the other condition ( $M_{\text{strongly aligned (direct, logo)}} = 5.24$ ,  $M_{\text{less strongly aligned (indirect, logo)}} = 4.25$ ,  $M_{\text{less strongly aligned (direct, no logo)}} = 4.69$ ,  $p$ 's n.s.).

Participants were asked at time 4 (after viewing the original claim) whether they had seen the opposite of the statement (i.e., whether they had seen the refutation). In support of our hypothesis that participants did not process the meaning of the refutation, subjects who saw a strongly aligned refutation were less likely to recall having seen the opposite compared with those who saw a less strongly aligned refutation ( $M_{\text{strongly aligned (direct, logo)}} = 4.00$ ,  $M_{\text{less strongly aligned (indirect, logo)}} = 4.98$ ,  $M_{\text{less strongly aligned (direct, no logo)}} = 4.89$ ), although these contrasts did not reach conventional levels of significance.

Results on belief in the refutation provide further support for our hypothesis that participants did not process the meaning of the refutation. Belief in the refutation (at time 3) was highest for strongly aligned claims compared to the other two conditions ( $M_{\text{strongly aligned (direct, logo)}} = 3.77$ ,  $M_{\text{less strongly aligned (indirect, logo)}} = 3.23$ ,  $M_{\text{less strongly aligned (direct, no logo)}} = 3.00$ ,  $F(1, 36) = 4.11$ ,  $p < .05$ ). Previous research has shown that refutations are rated as more false provided they are recognized as being refutations (Bacon, 1979; Begg & Armour, 1991; Gilbert et al., 1990). These results support our contention that consumers did not recognize the strongly aligned refutation as being the opposite of the original claim. These results are also consistent with the pattern of results found across Experiments 1 and 2 where belief in the refutation was lower in the less strongly aligned refutation conditions (e.g., direct, no logo), even though updating of beliefs was the highest in these conditions. Taken together, these results support our hypotheses that refutations that are aligned with the original claim cue recall of the original claim. On the one hand, this results in resistance to belief in the refutation but on the other hand, this results in updating of beliefs in the original claim.

## GENERAL DISCUSSION

It is difficult to refute claims that have been shown repeatedly and are believed to be true by customers (Bacon, 1979; Johar, 1996). This research explored how the alignability of the refutation and the claim impacts belief in both the refutation and the original claim. Direct refutations of direct claims (aligned) are believed less than refutations of indirect claims (not-aligned). This is because a refutation of a direct claim increases recall of the original claim on exposure to the refutation. However, this enhanced recall also results in updating of the original claim. Taken together, these results suggest that the updating is automatic. Despite lower belief in the refutation, belief in the original claim is adjusted to reflect the refutation. How-

ever, if the alignment is on multiple dimensions, the consumers may not recognize the refutation as being a refutation. Thus, because they do not process the meaning of the refutation, their belief in the original is less likely to be reduced by the refutation.

Theoretically, this research extends prior work on alignment and judgment revision (Pham & Muthukrishnan, 2002) by showing the process by which alignability impacts belief. It also explores the impact of multiple alignability cues. Experiment 1 showed that refutations of direct claims cue the original claim in memory—participants were more likely to recollect having seen the opposite claim on exposure to the refutation if the refutation and the original claim were both assertions. Recall of the original claim reduces belief in the refutation. At the same time, recall of the original claim also enables adjustment to the original claim. Importantly, Experiment 3 demonstrated that the alignment between the refutation and the original claim should not be too high. In this case perceptual familiarity precludes processing of the claim and updating is resisted.

These findings have theoretical implications for the debate on the mechanisms underlying the truth effect. While some research points to an encoding explanation, other research suggests that the effect occurs at the time of retrieval (Skurnik, Yoon, Park, & Schwarz, 2005). Our findings suggest that both forces may be at work. Claim familiarity can increase perceptions of truth through an encoding process of fluency but can also increase perceptions of truth through the process of bringing the previously processed claim to mind and facilitating updating.

The results suggest that belief updating may be an automatic process where consumers do not verify the credibility of the refutation before making an adjustment to their beliefs. Future research is needed to test the notion of automatic adjustment by including measures of consumers' awareness of altering beliefs and their intentions to do so. Future research should also examine other elements of the refutation that are likely to cue the original claim. Such elements could include the spokesperson, the type of appeal, or whether the refutation itself is asserted or implied. Indirect refutations that imply that the original claim is invalid may be effective under conditions where consumers expend effort on processing the refutation (e.g., high need for cognition consumers) or over time. Research could use a temporal inertia perspective to examine the delayed effects of direct vs. indirect refutations (Kardes et al., 2001).

Substantively, this research provides a guide to public policy makers and companies as to how best design effective refutations. In the case of Splenda, it appears that the Sugar Association has designed an effective refutation by directly contradicting Splenda's claim. Future research should also extend this research by examining the impact of repeated exposure to refutations on belief in the original claim as well as motivational factors that may prevent belief updating.

## APPENDIX A: THE STIMULI

Implication	All car rental companies offer collision-damage insurance payments. Avis is a car rental company.
Assertion	Avis offers collision-damage insurance.
Refutation	Avis does not offer collision-damage insurance.
Implication	A good VCR reliability history indicates that that brand of VCR needs few repairs. Sony VCRs have good reliability histories.
Assertion	Sony VCRs need few repairs.
Refutation	Sony VCRs need many repairs.
Implication	Abrasive hydrated silicon in toothpaste removes caffeine stains from teeth. Crest toothpaste contains abrasive hydrated silicon.
Assertion	Crest toothpaste removes caffeine stains from teeth.
Refutation	Crest toothpaste does not remove caffeine stains from teeth.
Implication	All good cordless phones sound a tone if the handset gets too far from its base. Panasonic cordless phones are good phones.
Assertion	Panasonic cordless phones sound a tone if the handset gets too far from its base.
Refutation	Panasonic cordless phones do not sound a tone if the handset gets too far from its base.

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