The Influence of Causal Conditional Reasoning on the Acceptance of Product Claims

ELISE CHANDON
CHRIS JANISZEWSKI*

The believability of product claims depends on the consumer’s ability to generate disabling conditions (i.e., other events blocking a cause from having its effect) and alternative causes (i.e., other events causing the outcome). The consideration of disabling conditions hurts the believability of product claims supported by arguments stated in a cause → effect and a ~ effect → ~ cause format, whereas the consideration of alternative causes hurts the believability of product claims supported by arguments stated in an effect → cause and a ~ cause → ~ effect format. These results have implications for the selection of the most persuasive product claim format.

There is a long history of research into the processes that influence a consumer’s response to persuasive communications (for reviews, see Kardes 2005; Meyers-Levy and Malaviya 1999; Petty and Cacioppo 1983). At a general level, theories of persuasion posit that people respond to a persuasive attempt based on a critical assessment of the message (e.g., central route to persuasion, systematic processing) or an intuitive inference about easily processed cues (e.g., peripheral route, heuristic processing; Eagly and Chaiken 1993; Petty and Cacioppo 1986). At a more specific level, researchers try to understand the processes that contribute to persuasion. For example, a systematic assessment of a persuasive communication relies on elaboration, reflection, and inference processes (Ahluwalia 2000; Kardes, Posavac, and Cronley 2004).

Advertisers can influence the systematic assessment of a persuasive communication by altering the presentation format of the communication. For example, consider the causal claim represented in the advertising slogan “Crest fights cavities.” The advertiser wants the consumer to make the deductive inference that using Crest toothpaste will prevent cavities. Yet, there are other ways that this information could have been conveyed. It could have been claimed that the failure to use Crest leads to more cavities, that people with cavities regularly use Crest, or that people with cavities did not use Crest. The persuasiveness of these different argument formats will depend on the consumer’s ability to draw a deductive inference and the degree to which this inference is counterargued (Kardes 1988; Kardes et al. 2004; Wright 1980).

Prior research investigating a person’s willingness to accept a causal claim has focused on two types of counterarguments (Cummins 1995; Cummins et al. 1991; Dieussaert, Schaeken, and D’Ydewalle 2002). First, a person’s ability to think of disabling conditions can make a claim less believable. For example, knowing that people with high sugar diets are more likely to have cavities may decrease a person’s willingness to believe that Crest prevents cavities. The presence of disabling conditions casts doubt on the sufficiency of the cause (e.g., using Crest). Second, the person’s ability to think of alternative causes can make a claim less believable. For example, knowing that good oral hygiene also prevents cavities may decrease a person’s willingness to believe that Crest prevents cavities. The presence of alternative causes casts doubt on the necessity of the cause.

We contend that the persuasiveness of a product claim will depend on a consumer’s ability to consider disabling conditions and alternative causes. Experiment 1 shows that encouraging a person to generate disabling conditions reduces the believability of claims stated using some types of argument formats, whereas encouraging a person to generate alternative causes reduces the believability of claims stated using other types of argument formats. Experiment 2 shows that consumers naturally list disabling conditions as reasons not to believe some types of product claims but list alternative causes as reasons not to believe other types of product claims. Thus, it may be beneficial to search for moderators

*Elise Chandon is assistant professor of marketing, Pamplin College of Business, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061 (echandon@vt.edu). Chris Janiszewski is the Jack Faricy Professor of Marketing, Warrington College of Business Administration, University of Florida, Gainesville, FL, 32611-7155 (chris.janiszewski@cba.ufl.edu). The authors thank Noreen Klein for her helpful comments.

John Deighton served as editor and Stephen Hoch served as associate editor for this article.
Electronically published October 8, 2008
that encourage or discourage the generation of disabling conditions and alternative causes and, consequently, decrease or increase persuasion.

**CONDITIONAL REASONING**

The assessment of a causal product claim is an active, elaborative activity that depends on deductive inferences (Kardes et al. 2004). Insight into this inference process depends on an understanding of how people engage in conditional reasoning. In a standard causal conditional reasoning task, people are given a rule of the form “If \( p \), then \( q \)” (where \( p \) is called the antecedent and \( q \) the consequent) and then are asked to make an inference about the truth of a conditional premise. A conditional premise is a combination of a fact (also called a premise) and a conclusion (also called a conditional statement). This task gives rise to four classic conditional inferences (see table 1).

Among the four conditional inferences, modus ponens and modus tollens are logically valid. Newstead et al. (1997) use the following example to illustrate why the modus ponens (MP\(_{p\rightarrow q}\)) and modus tollens (MT\(_{q\rightarrow p}\)) inferences are true and the affirmation of the consequent (AC\(_{q\rightarrow p}\)) and the denial of the antecedent (DA\(_{p\rightarrow q}\)) inferences are false. Assume a person is given the rule “If it is a dog, then it is an animal.” A MP\(_{p\rightarrow q}\) conditional premise (e.g., fact: it is a dog; conclusion: it is an animal) is true (i.e., given the rule, the conclusion follows from the fact). A MT\(_{q\rightarrow p}\) conditional premise (e.g., fact: it is not an animal; conclusion: it is not a dog) is also true. However, an AC\(_{q\rightarrow p}\) conditional premise (e.g., fact: it is a dog; conclusion: it is not a dog) and a DA\(_{p\rightarrow q}\) conditional premise (e.g., fact: it is not an animal; conclusion: it is not an animal) do not follow from the original rule. Research shows that people who are not trained in formal rules of inference can distinguish valid conditional premises from invalid conditional premises (Evans, Clibbens, and Rood 1995; Evans et al. 1999), although there are many situations in which they do not (Evans 1993; Evans and Handley 1999).

Mental Model Theory

When a person has not been trained to use formal rules of inference, deductive reasoning must occur via another process. Mental model theory proposes that people use their general knowledge to represent models proposed by information in their environment. Then, people assess the validity of these models by trying to think of competing models that might contradict the conclusion (Evans 1993; Evans and Handley 1999; Evans et al. 1999; Goldvarg and Johnson-Laird 2001; Johnson-Laird and Byrne 1991). To illustrate, consider the MP\(_{p\rightarrow q}\) claim “If you brush your teeth, you will not get cavities.” Mental model theory assumes that a person will begin the reasoning process by representing the model (e.g., brush teeth -> do not get cavities). Next, the person will attempt to think of models (counterexamples) that contradict the model. These counterexamples can include situations in which the antecedent does not lead to the consequent (e.g., “I brush my teeth, and I have cavities”) or the consequent occurs in the absence of the antecedent (e.g., “I do not brush my teeth, and I do not have cavities”). Third, if the search for valid (i.e., diagnostic) counterexamples is successful (unsuccessful), the person rejects (accepts) the original model and its conclusion.

**Naive Causal Deduction**

Denise Cummins and her colleagues (Cummins 1995; Cummins et al. 1991) assess the diagnosticity of two types of counterexamples: disabling conditions and alternative causes. A disabling condition prevents the consequent, despite the presence of the antecedent, because it casts doubt on the sufficiency of the antecedent. For example, Cummins gave respondents the rule “If the brake was depressed, then the car slowed down.” She then asked a question corresponding to the MP\(_{p\rightarrow q}\) conditional premise (e.g., “Given that the brake was depressed, do you agree that the car slowed down?”). To assess the truth of the conditional premise, participants supposedly generated scenarios in which the brake was depressed but the car did not slow down (e.g., the brake lines were cut, the road was icy). To the extent that participants could generate these disabling conditions, they were less likely to believe MP\(_{p\rightarrow q}\) conditional premises. Cummins found a similar result for MT\(_{q\rightarrow p}\) conditional premises.

An alternative cause can generate the consequent independent of the antecedent, hence it can cast doubt on the necessity of the antecedent. Again, Cummins gave participants the rule “If the brake was depressed, then the car slowed down.” She then asked a question corresponding to the AC\(_{q\rightarrow p}\) conditional premise (e.g., “Given that the car slowed down, do you agree that the brake was depressed?”).

### TABLE 1

<table>
<thead>
<tr>
<th>Argument format</th>
<th>Label</th>
<th>Rule</th>
<th>Conditional premise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modus ponens</td>
<td>MP(_{p\rightarrow q})</td>
<td>If ( p ), then ( q )</td>
<td>( p ), ( q )</td>
</tr>
<tr>
<td>Modus tollens</td>
<td>MT(_{q\rightarrow p})</td>
<td>If ( p ), then ( q )</td>
<td>Not ( q ), Not ( p )</td>
</tr>
<tr>
<td>Affirmation of the consequent</td>
<td>AC(_{q\rightarrow p})</td>
<td>If ( p ), then ( q )</td>
<td>( q ), ( p )</td>
</tr>
<tr>
<td>Denial of the antecedent</td>
<td>DA(_{p\rightarrow q})</td>
<td>If ( p ), then ( q )</td>
<td>Not ( p ), Not ( q )</td>
</tr>
</tbody>
</table>
To assess the truth of the conditional premise, participants supposedly generated scenarios in which the car could slow down for reasons other than depressing the brake (e.g., the car was going uphill, the engine stopped working). To the extent that participants generated alternative causes, they were less likely to believe AC\(_{q\rightarrow p}\) conditional premises. Cummins found a similar result for DA\(_{q\rightarrow r}\) conditional premises.

There is considerable evidence that people engage in naïve causal deduction. De Neys and his colleagues replicate Cummins’s findings and demonstrate that there is a high correlation between the number of disabling conditions and alternative causes associated with a conditional premise and the acceptance of the premise (De Neys, Schaeken, and D’Ydewalle 2002, 2003). They also show that retrieving additional disabling conditions and alternative causes encourages the rejection of a conditional premise (De Neys et al. 2002). Liu, Lo, and Wu (1996) show that the acceptance of MP\(_{q\rightarrow p}\) and MT\(_{q\rightarrow p}\) conditional premises is directly related to \(Pr(q|p)\). They also show that the availability of disabling conditions directly influences \(Pr(q|p)\). Verschuren, Schaeken, and D’Ydewalle (2005) find that \(Pr(q|p)\) is correlated with the availability of disablers and that it influences the acceptance rate of MP\(_{q\rightarrow p}\), MT\(_{q\rightarrow p}\), and alternative premises. They also find that \(Pr(q|p)\) is correlated with the availability of alternative causes and that it influences the acceptance rate of AC\(_{q\rightarrow p}\) and DA\(_{q\rightarrow r}\) conditional premises.

### Research Plan

The evidence on causal conditional reasoning, and the role of disabling conditions and alternative causes in naïve causal deduction, is compelling. Yet, these processes need not be instrumental in the acceptance of product claims. First, the sample of conditional premises used to investigate naïve causal deduction was deterministic (e.g., “If Mary jumped in the swimming pool, then she got wet”), whereas product claims are often probabilistic (e.g., “If you use hair conditioner, then your hair will be healthy”). Second, the methodology used to draw conclusions about processes supporting conditional reasoning has provided correlational evidence. It would be useful to provide experimental evidence that disabling conditions and alternative causes influence the acceptance of a conditional premise.

Our research plan is as follows. In experiment 1, we investigate the influence of considering disabling conditions and alternative causes on the believability of a conditional premise. We ask participants to read a conditional premise, to list disabling conditions or alternative causes, and to make a conditional inference. We show that listing disabling conditions influences the acceptance of an MP\(_{p\rightarrow q}\) and a MT\(_{q\rightarrow p}\) conditional premise but not an AC\(_{q\rightarrow p}\) and a DA\(_{q\rightarrow r}\) conditional premise. Similarly, we show that listing alternative causes influences the acceptance of an AC\(_{p\rightarrow q}\) and a DA\(_{q\rightarrow r}\) conditional premise but not a MP\(_{p\rightarrow q}\) and a MT\(_{q\rightarrow p}\) conditional premise. Study 2 shows that disabling conditions are naturally recruited as evidence against a claim made using a MP\(_{p\rightarrow q}\) or a MT\(_{q\rightarrow p}\) argument format and that alternative causes are naturally recruited as evidence against a claim made using an AC\(_{q\rightarrow p}\) or a DA\(_{q\rightarrow r}\) argument format.

### Experiment 1

Experiment 1 investigated the influence of disabling conditions and alternative causes on the acceptance of a conditional premise. Consistent with prior correlational evidence (Cummins 1995), we expected that asking people to generate disabling conditions would reduce the acceptance of a conditional premise stated using a MP\(_{p\rightarrow q}\) or a MT\(_{q\rightarrow p}\) argument format. In contrast, we expected that asking people to generate alternative causes would reduce the acceptance of a conditional premise stated using an AC\(_{q\rightarrow p}\) or a DA\(_{q\rightarrow r}\) argument format.

**H1a:** Generating disabling conditions will reduce the acceptance of conditional premises stated using a MP\(_{p\rightarrow q}\) or a MT\(_{q\rightarrow p}\) argument format but not using an AC\(_{q\rightarrow p}\) or a DA\(_{q\rightarrow r}\) argument format.

**H2b:** Generating alternative causes will reduce the acceptance of conditional premises stated using an AC\(_{q\rightarrow p}\) or a DA\(_{q\rightarrow r}\) argument format but not using a MP\(_{p\rightarrow q}\) or a MT\(_{q\rightarrow p}\) argument format.

### Method

**Stimuli.** A pretest was used to identify product claims that had the potential to elicit both disabling conditions and alternative causes. An initial set of 25 product claims was selected based on the authors’ subjective assessment of the believability of the claims. Forty-eight pretest participants were asked to generate reasons why each statement might be false. Participants were instructed to produce reasons that were realistic and different from each other, as well as to avoid simple variations of the same idea. Participants’ responses were used to generate a list of disabling conditions and alternative causes. The list was used to score each participant’s protocols. Eight product claims that had a high, and relatively similar, number of disabling conditions (\(M = 2.40\)) and alternative causes (\(M = 2.66\)) were selected as stimuli (see the appendix). Product claims were given at the category level so that the differential familiarity with brand names would not influence the results.

**Design.** The experiment used a 4 (argument format: MP\(_{p\rightarrow q}\), MT\(_{q\rightarrow p}\), AC\(_{q\rightarrow p}\), DA\(_{q\rightarrow r}\); within subject) by 3 (reasons generated: disablers, alternatives, none; between subject) mixed design with two sets of four product claim replicates (between subject) and two argument format orders (a between-subject counterbalancing factor). The first replicate set included product claims corresponding to Certo, Crest, Jeep, and Pampers (see the first four statements in the appendix), and the second replicate set included product claims corresponding to Head & Shoulders, Pantene,
were then given a sample conditional premise: 

The dependent measure. Participants were told that they would be asked to list reasons the conclusion could be false. The instructions listed sample reasons including “the person did not use a liquid dishwasher detergent but the dishes are spotless.” The instructions listed sample reasons including “faulty dishwasher,” “unusually shaped dishes not adapted for dishwasher use,” and “there was no hot water available.” Similarly, participants in the alternative causes condition were told, “Now imagine that a person used a liquid dishwasher detergent but the dishes are not spotless. Can you think of reasons why the dishes might not be spotless (even though the person used a liquid dishwasher detergent)?” The instructions listed sample reasons including “faulty dishwasher,” “unusually shaped dishes not adapted for dishwasher use,” and “there was no hot water available.”

Procedure. The procedure consisted of two stages. Stage 1 familiarized participants with the procedure. Participants were informed that they would be asked to assess whether a fact led to a conclusion. Participants were shown a sample rule and a corresponding fact and conclusion. Then, participants in the two reasons conditions were told that they would be asked to list reasons the conclusion could be false. They were told, “Consider the following rule: if a person uses a liquid dishwasher detergent, the person’s dishes will be spotless.” Then, participants in the disabling conditions condition were told, “Now imagine that a person uses a liquid dishwasher detergent but the dishes are not spotless. Can you think of reasons why the dishes might not be spotless (even though the person used a liquid dishwasher detergent)?” The instructions listed sample reasons including “faulty dishwasher,” “unusually shaped dishes not adapted for dishwasher use,” and “there was no hot water available.” Similarly, participants in the alternative causes condition were told, “Now imagine that a person does not use a liquid dishwasher detergent but the dishes are spotless. Can you think of reasons why the dishes might be spotless (even though the person did not use a liquid dishwasher detergent)?” The instruction listed sample reasons including “the dishes are brand new,” “the dishes were washed by hand,” and “the dishes were not dirty after eating.”

Next, all participants were given an explanation of the dependent measure. Participants were told that they would have to determine whether a fact leads to a conclusion. They were then given a sample conditional premise:

<table>
<thead>
<tr>
<th>Argument format</th>
<th>Presentation</th>
<th>Conditional premise</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPₚ₋ₚ</td>
<td>Rule</td>
<td>If the person uses a breath mint, the person will have fresh breath.</td>
</tr>
<tr>
<td>Fact</td>
<td>The person uses a breath mint.</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>The person will have fresh breath.</td>
<td></td>
</tr>
<tr>
<td>ACₚ₋ₚ</td>
<td>Rule</td>
<td>If the person does not use a breath mint, the person will have fresh breath.</td>
</tr>
<tr>
<td>Fact</td>
<td>The person did not use a breath mint.</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>The person will have fresh breath.</td>
<td></td>
</tr>
<tr>
<td>MT₋ₚ₋ₚ</td>
<td>Rule</td>
<td>If the person has fresh breath, the person used a breath mint.</td>
</tr>
<tr>
<td>Fact</td>
<td>The person has fresh breath.</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>The person used a breath mint.</td>
<td></td>
</tr>
<tr>
<td>DA₋ₚ₋ₚ</td>
<td>Rule</td>
<td>If the person will have fresh breath, the person used a breath mint.</td>
</tr>
<tr>
<td>Fact</td>
<td>The person did not use a breath mint.</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>The person will not have fresh breath.</td>
<td></td>
</tr>
</tbody>
</table>

The validity of the conclusion was assessed using a 7-point rating scale, where 1 was “very sure I cannot draw this conclusion” and 7 was “very sure I can draw this conclusion,” with 4 representing “cannot tell.” Participants in the no-reasons condition only received an explanation of the dependent measure (i.e., the instructions did not mention reasons).

In stage 2, participants in the reasons conditions were asked to (1) generate reasons and (2) judge the validity of the conclusions for four conditional premises. Participants in the reasons conditions (e.g., generate disablers, generate alternatives) were given a minimum of 1 minute to generate reasons. Participants in the no-reasons condition simply assessed the validity of the conclusions for four conditional premises.

Results

Four hundred nineteen students from an undergraduate subject pool at the University of Florida participated in the study in exchange for extra credit. Reasons were coded as disabl...
as less (equally) valid when participants were asked to generate disabling conditions (alternative causes) than when they were not. For the MP₁argument format, generating disablers (M = 4.49) led to less acceptance of the conditional premises as compared to not generating reasons (M = 5.07; F(1, 401) = 8.45, p < .01), whereas generating alternatives (M = 4.96) had no influence on the acceptance of the conditional premises as compared to not generating reasons (M = 5.07; F(1, 401) = .28, p > .05). For the MT₂argument format, generating disablers (M = 3.48) led to less acceptance of the conditional premises as compared to not generating reasons (M = 3.84; F(1, 401) = .79, p = .06), whereas generating alternatives (M = 3.66) had no influence on the acceptance of the conditional premises as compared to not generating reasons (M = 3.84; F(1, 401) = .66, p > .05). These results are consistent with hypothesis 1a.

Four planned contrasts were used to test the hypothesis that conditional premises stated using the AC₂argument format and DA₂argument formats would be perceived as less (equally) valid when participants were asked to generate alternative causes (disabling conditions) than when they were not. For the AC₂argument format, generating alternatives (M = 3.32) led to less acceptance of the conditional premises as compared to not generating reasons (M = 3.81; F(1, 401) = 4.89, p < .01), whereas generating disablers (M = 3.86) had no influence on the acceptance of the conditional premises as compared to not generating reasons (M = 3.81; F(1, 401) = .19, p > .05). For the DA₂argument format, generating alternatives (M = 2.99) led to less acceptance of the conditional premises as compared to not generating reasons (M = 3.52; F(1, 401) = 5.79, p < .05), and generating disablers (M = 3.89) unexpectedly led to more acceptance of the conditional premises as compared to not generating reasons (M = 3.52; F(1, 401) = 3.80, p = .06). These results are consistent with hypothesis 1b.

Discussion

The results of experiment 1 showed that actively generating disabling conditions reduced a person’s acceptance of conditional premises stated using a MP₁argument format but not the person’s acceptance of conditional premises stated using an AC₂or a DA₂argument format. In contrast, actively generating alternative causes reduced a person’s acceptance of conditional premises stated using an AC₂or a DA₂argument format but not the person’s acceptance of conditional premises stated using a MP₁or a MT₂argument format. These results supplement the conditional reasoning literature in two important ways. First, experiment 1 stimuli consisted of rules that were probabilistic (e.g., advertising claims) as opposed to deterministic (i.e., statements of fact). Second, unlike prior studies, the content of the rule and the propensity to consider disabling conditions and alternative causes were not confounded. That is, the same content was used to assess the influence of disabling conditions and alternative causes on the acceptance of the four types of conditional premises.

Experiment 1 is a good starting point for understanding how naive causal deduction might influence the acceptance of product claims, but it is not representative of how people naturally experience and respond to advertising claims. Experiment 1 used a procedure that is common to the conditional reasoning literature. Participants were asked to consider a rule (i.e., a product claim), consider a fact, consider a conclusion, and then decide whether the conclusion could be drawn from the fact given the rule. Although this procedure maximizes the internal validity associated with a conditional reasoning test, it limits the external validity associated with the evaluation of advertising claims. In experiment 2, we asked participants to counterargue product claims stated using a fact-conclusion format.

EXPERIMENT 2

The objective of experiment 2 was to show that consumers naturally use disabling conditions and alternative causes to judge the validity of a conditional premise. Unlike experiment 1, in which participants were forced to generate disabling conditions or alternative causes prior to judging the validity of the conditional premise, the experiment 2 procedure asked participants to report reasons to reject the conditional premise. Thus, we expected that an assessment of a MP₁or a MT₂argument would result in the listing of disabling conditions as the reason to reject the claim, whereas an assessment of an AC₂or a DA₂argument

---

TABLE 3

RESULTS OF EXPERIMENT 1

<table>
<thead>
<tr>
<th>Argument format</th>
<th>Control group Claim acceptance</th>
<th>Generate disablers group Disablers generated</th>
<th>Alternatives generated</th>
<th>Generate alternatives group Claim acceptance</th>
<th>Disablers generated</th>
<th>Alternatives generated</th>
<th>Claim acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP₁ₚ→q</td>
<td>5.07</td>
<td>2.42</td>
<td>.00</td>
<td>4.49*</td>
<td>.03</td>
<td>2.31</td>
<td>4.96</td>
</tr>
<tr>
<td>MT₁ₚ→q</td>
<td>3.84</td>
<td>2.36</td>
<td>.00</td>
<td>3.48*</td>
<td>.00</td>
<td>2.33</td>
<td>3.66</td>
</tr>
<tr>
<td>AC₂ₚ→q</td>
<td>3.81</td>
<td>2.32</td>
<td>.00</td>
<td>3.86</td>
<td>.00</td>
<td>2.41</td>
<td>3.32*</td>
</tr>
<tr>
<td>DA₂ₚ→q</td>
<td>3.52</td>
<td>2.30</td>
<td>.00</td>
<td>3.89*</td>
<td>.01</td>
<td>2.26</td>
<td>2.99*</td>
</tr>
</tbody>
</table>

*Cell mean differs from control group mean at p < .05 significance.

*Cell mean differs from control group mean at p < .10 significance.
would result in the listing of alternative causes as the reasons to reject the claim.

Similar to experiment 1, we presented these claims using a category label (e.g., breath mint) as opposed to a brand label (e.g., Certs) in order to avoid biases created by familiarity with the brand or its advertising. There was one noteworthy change in the experiment 2 procedure relative to experiment 1. We made the procedure more representative of how a person might experience an advertising claim. More specifically, we presented a conditional premise (i.e., fact/conclusion) and asked the participant to list two reasons the conditional premise could be false.

Method

Stimuli and Design. The product claims were the claims used in experiment 1. The experiment used a four-cell (argument format: MP, MT, AC, DA) within-subject design with two product claim presentation orders (a between-subject counterbalancing factor). A Latin square design was used to control the assignment of argument format to each product claim (i.e., a participant saw eight product claims, two stated in each argument format). The presentation order counterbalance factor conditions were Head & Shoulders, Certs, Crest, Jeep, Pampers, Pante, Slim-Fast, Whiskas, and the reverse. The key dependent measure was the type of counterargument listed.

Procedure. The procedure was fairly simple. The instructions told participants that they would see nine statements (the first statement was always a practice statement). Participants were told, “For each statement, we will ask you to read it and list the reasons it could be false.” For each conditional premise, an initial page presented the premise (e.g., a fact and conclusion). Participants hit a Continue button to advance. The second page presented the conditional premise a second time and asked participants to list two logically valid reasons why the statement could be false. We specified “logically valid reasons” because we wanted the respondents to give us reasons that were diagnostic, which might not necessarily be the same as reasons that were most accessible. This process was repeated for the next eight conditional premises. Unlike experiment 1, the procedure contained no reference to, or information about, disabling conditions and alternative causes. In effect, participants were free to respond using any format they wished.

Results

Eighty one students from an undergraduate subject pool at the University of Florida participated in the study in exchange for extra credit. The counterarguments were coded as alternative causes, disabling conditions, and other. These thoughts were then aggregated across the eight replicates. They are listed in table 4.

As predicted, there were main effects of argument format on the number of disabling conditions and alternative causes listed by the participants. The number of disabling conditions listed was higher when the MP format (M = 1.35) and MT format (M = 1.28) argument formats were used as compared to when the AC format (M = .22) and DA format (M = .36) argument formats were used (F(1,73) = 185.60, p < .001). The number of alternative causes listed was higher when the AC format (M = 1.26) and DA format (M = 1.09) argument formats were used as compared to when the MP format (M = .27) and MT format (M = .25) argument formats were used (F(1,73) = 171.49, p < .001). There was no interaction of argument format and the counterbalance factor on the number of disabling conditions (F(1,79) = 2.09, p > .05) or alternative causes (F(1,79) = 1.17, p > .05) listed.

Discussion

Experiment 2 shows that people naturally recruit disabling conditions when assessing the validity of claims made using a MP or a MT argument format and naturally recruit alternative causes when assessing the validity of claims made using an AC or a DA argument format. Thus, the experiment provides further evidence that these are the types of counterarguments that are recruited when assessing the validity of a product claim.

GENERAL DISCUSSION

In this article, we have provided evidence that a person’s acceptance of a product claim is influenced by his ability to think of disabling conditions and alternative causes. When asked to generate disabling conditions, participants were less prone to believe conditional premises stated using a MP or a MT argument format as opposed to an AC or a DA argument format. When asked to generate alternative causes, participants were less prone to believe in conditional premises stated using an AC or a DA argument format as opposed to a MP or a MT argument format. Experiment 2 extended these findings by showing that people naturally recruit disabling conditions when assessing the validity of claims made using a MP or a MT argument format and naturally recruit alternative causes when assessing the validity of claims made using an AC or a DA argument format. This research shows that, unless a product claim is clearly more engaging in a specific format, it may be informative to test the claim in a MP or a MT argument format for those claims that naturally generate more alternative causes than disabling
conditions and, similarly, to test the claim in an AC_{p\rightarrow q} or a DA_{p\rightarrow q} argument format for those claims that naturally generate more disabling conditions than alternative causes.

There was one unexpected finding. Experiment 1 found that when participants were asked to generate disablers, the perceived validity of the DA_{p\rightarrow q} formatted claim (e.g., $M = 3.89$) increased compared to the control group (e.g., $M = 3.52$). This pattern of results has been found in previous research (De Neys et al. 2002, 2003; Markovits and Potvin 2001) in which premises associated with many disablers were perceived as more valid when stated using an AC_{p\rightarrow q} or a DA_{p\rightarrow q} argument format. De Neys and his colleagues argued that generating disabling conditions prevented people from generating alternative causes. This interference effect could explain our unexpected result. Curiously, Markovits and Potvin (2001) found that generating alternative causes decreased the perceived validity of premises stated using MP_{p\rightarrow q} and MT_{p\rightarrow q} formats. They reasoned that generating disablers prevents the generation of alternatives (the De Neys result) but that the reverse is not true. In fact, it seems that generating alternatives leads to spontaneously generating disablers. To reconcile these two findings, De Neys et al. (2002) suggested that people tend to retrieve disablers before alternatives. Indeed, in experiment 2, the data showed directional evidence that participants generated more disablers than alternatives. More specifically, the DA_{p\rightarrow q} format led to generating relatively fewer alternatives ($M = 1.09$) as compared to the AC_{p\rightarrow q} format ($M = 1.26$; $F(1, 80) = 3.15, p < .1$) and slightly more disablers ($M = .64$) as compared to the AC_{p\rightarrow q} format ($M = .22$; $F(1, 80) = 5.53, p < .05$).

Results of experiment 2 suggested that participants tend to generate the highest number of counterarguments (both disablers and alternatives) when statements were stated in the MP_{p\rightarrow q} format (compared to the DA_{p\rightarrow q} format). For the MP_{p\rightarrow q} format, the total number of counterarguments generated in experiment 2 ($M = 1.62$) was higher than the total number of counterarguments generated in the DA_{p\rightarrow q} format ($M = 1.45$; $F(1, 80) = 5.37, p < .05$). However, results in experiment 1 seemed to indicate that the MP_{p\rightarrow q} format led to a higher acceptance rate than that of the DA_{p\rightarrow q} format. In the control group condition of experiment 1, the acceptance rate for the MP_{p\rightarrow q} format ($M = 5.07$) was higher than that of the DA_{p\rightarrow q} format ($M = 3.52$; $F(1, 146) = 66.59, p < .05$). How could this apparent contradiction be explained?

It is possible that a factor might moderate the consideration of alternative causes and disabling conditions. Investigations into counterfactual thinking suggest that the accessibility of different types of counterarguments will depend on the framing of the causal claim. Roese, Hur, and Pennington (1999) investigated scenarios in which protagonists failed to achieve a promotion goal (e.g., “Jane failed to get an A in a class”) or a prevention goal (e.g., “John mistakenly ate nuts and suffered an allergic reaction”). Participants were asked to consider the scenario and provide counterfactual thoughts (e.g., “If only . . .”).
low us to gain a better understanding of why certain conditional premises, and by extension product claims, are more believable.

APPENDIX

STIMULI IN EXPERIMENT 1

Product claims:
1. If a person uses a breath mint, then the person will have fresh breath.
2. If a person uses toothpaste, then the person will not have cavities.
3. If a person uses a four-wheel-drive vehicle, then the person can travel on rough terrain.
4. If a person uses diapers with stretchy elastic, the diapers will not leak.
5. If a person uses antidandruff shampoo, the person will not have dandruff.
6. If a person uses hair conditioner, then the person’s hair will be strong, shiny, silky, and soft.
7. If a person consumes diet food, then the person will lose weight.
8. If a person gives food to a cat, then the cat will purr.

REFERENCES


Pett, Richard E. and John T. Cacioppo (1983), *Attitudes and Per-
suasion: Classic and Contemporary Approaches, Dubuque, IA: Brown.