The Effects of Hedges in Persuasive Arguments: A Nuanced Analysis of Language

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The Effects of Hedges in Persuasive Arguments

A Nuanced Analysis of Language

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Drawing together research on persuasion and text comprehension, two experiments test the effects of hedge placement (Experiment 1) and hedge type (Experiment 2) on attitudes, source evaluations, and perceptions of argument strength. Participants read an editorial in support of implementing comprehensive exams at their university. Experiment 1 shows that hedges placed on data statements (and not interpretation statements) lead to negative perceptions of the policy, source, and argument. This is especially pronounced on source evaluations among individuals with more scientific training. Experiment 2 reveals that colloquial, but not professional, hedges placed on interpretation statements lead to more negative evaluations relative to no hedges. Data related to perceptions of the source are moderated by individual differences in scientific reasoning. This research suggests that hedges describing data statements and/or that use colloquial language can, but do not always, undermine persuasive attempts.

Keywords: *persuasion; attitudes; hedges; qualifiers*

Many variables can affect the extent to which a persuasive communication changes attitudes and guides perceptions of the message and the source of the message (Hovland, Janis, & Kelly, 1953). Several models have been proposed (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986), often examining how persuasion occurs as a result of aspects of the message itself (e.g., argument strength, number of arguments) or as a result of aspects of the way the message is presented (e.g., source likability or authority; see review by Eagly & Chaiken, 1993). Moreover, depending on how a persuasive communication is composed and conveyed, certain aspects of communications are more demanding of cognitive resources than others.

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Research has shown that individuals will be more affected by resource-demanding aspects of a persuasive communication if the individual is both motivated and able to attend to those aspects of the communication (e.g., Cacioppo, Petty, Kao, & Rodriguez, 1986; Chaiken, 1980; Kruglanski & Thompson, 1999; Leippe & Elkin, 1987; Petty, Cacioppo, & Goldman, 1981).

Researchers have shown that certain linguistic aspects of persuasive messages can affect how they are received by an audience. For example, hesitations and disclaimers are linguistic markers that denote powerlessness and can undermine persuasive attempts (for a review, see Ng & Bradac, 1993). Relevant to the current research are persuasive communications that contain hedges. Hedges, a specific type of qualifier, are words used to modify the meaning of a statement by commenting on the uncertainty of the information or on the uncertainty of the writers. For example, a politician may say 1a rather than 1b or 1c because 1a will be perceived as more powerful despite the potential threat to the actual truth of the unqualified statement.

1a. The threat of capital punishment deters criminals from doing heinous acts, thereby reducing the threat to the citizens in our state.
1b. *Probably*, the threat of capital punishment *kind of* deters criminals from doing *sort of* heinous acts, and this *possibly* reduces the threat to the citizens in our state.
1c. *In general*, the threat of capital punishment deters criminals from doing *some of the most* heinous acts, and this *may* reduce the threat to the *most vulnerable* citizens in our state.

Several studies have shown that powerless language that included the use of hedges, such as those in 1b (e.g., probably, kind of, sort of, and possibly), undermined persuasion and/or perceptions of the source and message (Carli, 1990; Gibbons, Busch, & Bradac, 1991; Holtgraves & Lasky, 1999; Hosman, 1989; Hosman, Huebner, & Siltamen, 2002). Moreover, researchers have isolated the effects of hedges versus other linguistic markers and showed that messages with hedges led to less persuasion, more negative perceptions of the source, and weaker evaluations of the argument relative to a no-hedge control message (Blankenship & Holtgraves, 2005; Hosman & Siltamen, 2006). The presence of hedges dampened perceptions of the source of the message as well as the strength of the argument and led to less persuasion (Blankenship & Holtgraves, 2005). The authors of this research underscored the complexity of these effects, thereby showing that hedges undermined persuasive attempts by changing evaluations of the argument as well as perceptions of how the argument was conveyed. This study suggests that hedges diminish the strength of the claims that are made in an argument and undermine persuasive attempts in multiple ways.

Hedges, however, are sometimes required to capture the probabilistic nature of reality and the limits of statements (Toulmin, 2003). In fact, the use of hedges (or modifiers) is typical of professional writing to make absolute statements more accurate as in 1c (Butler, 1990; Hyland, 1998; Markkanen & Schroeder, 1997; Skelton, 1988). Hedges play a critical role in academics' presentations of their own work (Hyland,

1998) as well as the paraphrasing of others' findings and conclusions. For instance, Horn (2001) found that when authors of biology research articles paraphrased others' results, they maintained the hedges from statements in the original sources approximately two thirds of the time. This textual analysis supports both the use of hedges in academic writing and the importance of these hedges to the meaning of statements of experimental results. Thus, not all modifiers denote *powerless language* and nonscientist readers may also be sensitive to the professional use of hedges.

In considering the professional academic use of hedges more closely, two characteristics seem most important: their placement and type. In academic articles, hedges are not equally distributed throughout a research article. Skelton (1988) analyzed 20 journal articles from the hard sciences and found that most of the hedging (19.33 per 1,000 words) occurred in the discussion, followed by the introduction (9.70 per 1,000 words). Hedging in the results/method section was much more rare (4.39 per 1,000 words). This research suggests that scientists choose to use hedges when interpreting their own and others' data, but not when they are describing the methodology and data from a given study.

An analysis of the Blankenship and Holtgraves (2005) message revealed that half of the hedges were on statements presenting data. Consider Claims 2 and 3 below:

2. Ninety-two percent of the students who take the comprehensive exams *sort of* have jobs on graduation.
3. The institution of comprehensive exams would *probably* improve the effectiveness of Northern Illinois University.

Claim 2 includes a hedge (sort of) on a verifiable statement of specific results. Either 92% of the students had jobs or they did not, and the presence of the hedge reduces the accuracy of the statement. In contrast, Claim 3 is an evaluative statement of a prediction. Although the exams may improve the university's effectiveness, this is uncertain. Thus, it is expected that using hedges on definite statements presenting data, such as Claim 2, would undermine the potency of the statement, whereas using hedges on interpretation statements, such as Claim 3, would not.

In addition to the placement of hedges and how they can alter the meaning of a given claim, the type of hedges (e.g., 1b vs. 1c) may be more or less appropriate in different contexts, and this might also affect one's perception of the message. Based on a corpus analysis of a large set of research articles, Hyland (1998) classified common academic hedges in terms of their syntactic role. These include adjectives and adverbs (e.g., most, possibly, probably), judgmental verbs (e.g., suggest, imply), evidential verbs (e.g., appear, seem), and modal verbs (e.g., may, should). Whereas the Blankenship and Holtgraves (2005) message did include two of these common academic hedges (i.e., possibly and probably), two thirds of their hedges were never found in academic papers (i.e., sort of, kind of). The type of hedge may influence one's perspective of the speaker, message quality, and persuasiveness. It may be that

colloquial hedges are viewed as powerless, but academic hedges are viewed as professional.

The current research was designed to test the alternative predictions drawn from the persuasion and discourse literatures concerning the use of hedges to better understand how and why hedges might undermine persuasive communications. One possibility is that the presence versus absence of hedges undermines the effectiveness of persuasive attempts in general. This prediction is consistent with the view that all hedges are viewed as powerless. A second possibility is that the effects of hedges depend on how they are used and whether the chosen hedges are appropriate to the persuasive context. We conducted two experiments to test whether the presence of hedges in general or the placement (Experiment 1) and type (Experiment 2) of hedges undermined persuasion, perceptions of the source, and evaluations of the argument in response to a persuasive message.

Experiment 1

In prior research showing the deleterious effects of hedges on argument strength (Blankenship & Holtgraves, 2005), hedges typically accompanied statements of research results rather than statements of interpretations of results. The placement of hedges in relation to research results may have exaggerated the negative effects of hedges on argument strength. The purpose of Experiment 1 was to replicate and extend research by Blankenship and Holtgraves, which showed that a message with hedges adversely affected the persuasiveness of the message relative to a message without hedges. In the current study, participants read one of three editorials concerning the positive effects on universities and students of implementing senior comprehensive exams. The control condition, identical to the control condition of Blankenship and Holtgraves, contained no hedges. The two other versions contained hedges. The data condition was identical to the hedge condition of Blankenship and Holtgraves with most of the hedges on data statements. The interpretation condition presented the same six hedges but all were moved to the next closest interpretative statement. This experiment tested whether the placement of hedges or the mere presence of hedges determines when hedges undermine persuasive attempts. Specifically, we hypothesized that hedges used to temper statements about data would undermine argument effectiveness but that hedges used to temper statements about interpretations would not undermine argument effectiveness.

Method

Participants. The participants in this study were 150 students (46% male, excluding two individuals who did not report their gender) from a Midwestern university. The

students were drawn from two undergraduate courses and participated in the study in exchange for course credit. Forty percent of the sample was drawn from an introductory psychology course and the remaining 60% was from a research methods course. The research methods course is also taught in the psychology department and is taken primarily by students in their junior year of college.

Materials. Participants read and responded to one of three versions of an editorial offering support for the implementation of final exams.[1] The content of the editorials was the same as that used by Blankenship and Holtgraves (2005) except that the name of the university where the policy would be implemented was changed to be the school the participants attended. All versions of the editorial contained strong arguments for why final exams should be implemented at the university (e.g., improve learning, expand employment opportunities). The versions of the editorial varied by condition and differed based on whether the editorial contained hedges, and if so, where the hedges were placed. The editorial used in the control condition did not contain any hedges and was identical to that used in prior research. Two other versions contained the same six hedges used previously: sort of (two), kind of (two), probably (one), and possibly (one). For the data hedges condition, it was decided to have the argument identical to that used previously so that two conditions replicated prior research directly. This meant that most, but not all, of the hedges appeared in statements of research results (data hedges). The final version, interpretation hedge condition, moved all hedges to statements interpreting research results rather than statements presenting actual data. The control text was 310 words, the data hedge text was 320 words, and the interpretation hedge text was 319 words. The Flesch–Kincaid reading grade level of each of the three texts was 12th grade.

After reading the editorial, participants completed the primary questionnaire that contained four sets of items to measure their attitude toward the proposal, evaluation of the source, perceptions of the strength of the argument, and the appropriateness of the language used in the editorial. These items were identical to those used by Blankenship and Holtgraves (2005) and the last measure was the same as their manipulation check. The first four questions were 7-point semantic differential items assessing participants' attitudes about the implementation of comprehensive exams (*harmful/beneficial*, *unfavorable/favorable*, *foolish/wise*, and *undesirable/desirable*). A Likert-type item was also included for participants to report how much they agreed with the proposal to implement comprehensive exams from 1 (*strongly disagree*) to 7 (*strongly agree*). These five items evidenced good internal consistency ($\alpha = .90$).

Participants also answered 13 semantic differential items measuring participants' perceptions of the source of the editorial. Consistent with prior research (Blankenship & Holtgraves, 2005), four of these items were used to assess participants' evaluation of the source (*very unknowledgeable/very knowledgeable*, *very untrustworthy/very trustworthy*, *very unlikable/very likable*, and *very incompetent/very competent*). These items also evidenced high internal consistency ($\alpha = .81$).

The third set of items included four semantic differential items that assessed participants' perceptions of the strength of the argument presented (*very unsound/very sound*, *very illogical/very logical*, *very poorly reasoned/very well reasoned*, and *very weak/very strong*). Cronbach's alpha equaled .91.

Finally, participants were given a postexperiment questionnaire that included several questions to obtain demographic information and to check participants' sensitivity to the manipulation. Participants reported in a free-response format their thoughts about suggested changes to improve the argument made in the editorial. In addition, four questions served as a manipulation check. Participants rated whether they felt the author of the editorial used appropriate language in general and also whether they used an appropriate number of particular words (e.g., sort of, probably). Cronbach's alpha equaled .91.

Design and procedure. This experiment was a one-way, three-cell design. Participants were randomly assigned to one of three editorial conditions (no-hedge, data hedge, or interpretation hedge). The dependent variables included attitudes about the policy, perceptions of the source, and evaluations of the argument strength.

Participants recruited from introductory psychology completed the experiment in small groups of up to 20 individuals. Participants recruited from the research methods course took part in the experiment during their regularly scheduled class time. Following consent procedures, the experimenter introduced the topic and conveyed the cover story to the participants (Blankenship & Holtgraves, 2005). Participants were told that the psychology department at their university was assisting the College of Communication, Information, and Media in evaluating editorials that had been sent in by colleges and universities around the country. Participants also learned that the editorial topic they would be reading about was on the implementation of comprehensive final exams for seniors, a policy presumed to be counterattitudinal. Participants were also told that the president of their university was recommending a number of changes to begin the next academic year as a result of recent academic evaluations. One of the proposed changes included the implementation of comprehensive final exams for all seniors.

Participants read the assigned editorial and returned it to the experimenter before receiving the evaluation questionnaire. Participants were instructed to read the editorial carefully and then to respond to the items on the questionnaire.

Results and Discussion

To evaluate the effectiveness of the manipulation, a one-way, three-group (editorial condition: control, data hedge, and interpretation hedge) ANOVA was conducted on the manipulation check. Higher values indicate more positive evaluations of the language used in the editorial. The ANOVA yielded an effect of condition, $F(2, 147) = 23.24$, $p < .01$. Tukey post hoc tests indicated that participants in the control condition

($M = 4.87$, $SD = 1.16$) rated the language as more professional than did those in the interpretation hedge condition ($M = 3.50$, $SD = 1.79$) and the data hedge condition ($M = 2.89$, $SD = 1.49$). Moreover, participants in the interpretation hedge condition rated the language as more professional than did participants in the data hedge condition even though the set of hedges were identical. Only the placement differed among the two experimental conditions. This suggests that participants recognized the use of hedges in the editorial and that the presence of hedges affected their perceptions of the appropriateness of language used in the editorials. The editorial containing interpretation hedges was rated more positively than the editorial containing data hedges. However, the editorial containing no hedges was evaluated more positively than the editorial containing interpretation hedges, suggesting that even the hedges of interpretations were still perceived as somewhat inappropriate.

Next, we conducted a one-way, three-group ANOVA to examine whether editorial condition affected participants' attitudes about the policy. This analysis revealed a significant effect, $F(2, 147) = 6.07$, $p < .01$. Post hoc tests indicated that participants who were either in the control ($M = 4.73$, $SD = 1.38$) or in interpretation ($M = 4.47$, $SD = 1.27$) condition were more in favor of the policy than those in the data hedge condition ($M = 3.84$, $SD = 1.28$). However, unlike the effect described above, participants' attitudes in the control condition were not different from those in the interpretation hedge condition. Consistent with our hypotheses, the placement of hedges affected participants' attitudes. Participants were less persuaded by the editorial if it contained hedges on data statements than if the editorial contained hedges on interpretation statements or did not contain hedges.

Next, we conducted a one-way ANOVA to evaluate the extent to which editorial condition affected perceptions of the source of the editorial. This analysis yielded a significant effect, $F(2, 147) = 6.57$, $p < .01$. Consistent with our hypotheses, the source of the argument was evaluated less positively in the data hedge condition ($M = 4.00$, $SD = 1.13$) than in the control ($M = 4.72$, $SD = 0.94$) or interpretation ($M = 4.55$, $SD = 1.05$) condition. The control and interpretation conditions did not differ from each other.

Finally, there was also a significant effect of editorial condition on argument quality ratings, $F(2, 147) = 8.57$, $p < .01$. Again, post hoc tests indicated that the argument was perceived as being lower quality by participants in the data condition ($M = 3.87$, $SD = 1.40$) than in the control ($M = 4.85$, $SD = 1.19$) or interpretation ($M = 4.74$, $SD = 1.29$) condition, which were not reliably different.

These results replicate the findings of Blankenship and Holtgraves (2005) that the source of a message marked with hedges primarily on data statements was viewed more negatively and that the message itself was viewed as less persuasive and weaker compared with an unhedged message. As predicted, data-hedged statements were also viewed more negatively than interpretative-hedged statements, which were not viewed negatively relative to an unhedged message. This hedge location difference may have been even greater had we put all the hedges on data statements rather than opt to make the condition identical to Blankenship and Holtgraves's condition.

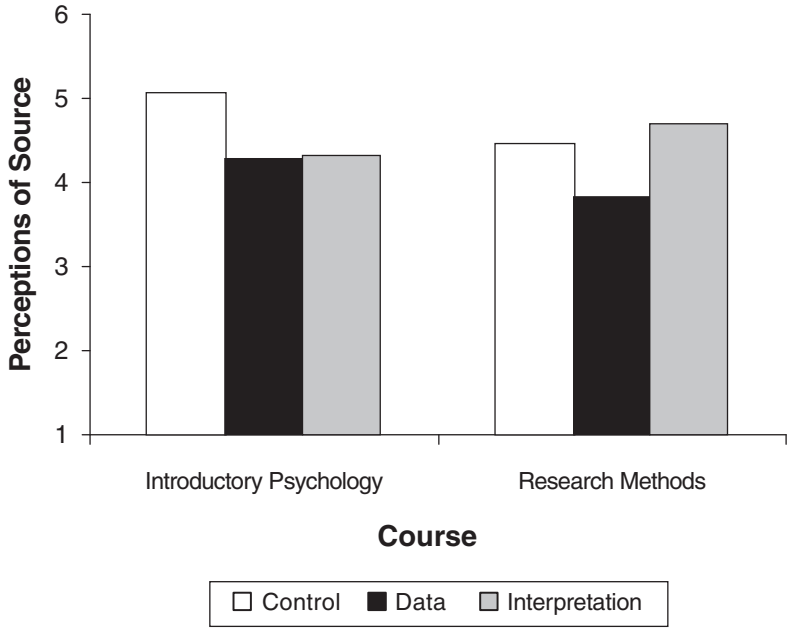
These results are consistent with the more nuanced analysis of the effects of hedges on attitudes, source, and argument evaluations and show that the location of hedges influences individuals' evaluations of an argument. These results do not support the idea that hedges undermine persuasion attempts in general. Instead, the results show that undergraduate students are sensitive to the placement of hedges. It is possible that they realize that qualifying statements on interpretation or conclusion is more acceptable than qualifying statements about specific research findings.

Ancillary Analyses

The nature of this sample, drawing from both introductory psychology and research methods courses, lent itself to further analysis. Although the initial goal of this experiment was not to test differences between the students from each course, it was possible that participants' sensitivity to the distinction between data and interpretation statements might vary between students who have had more scientific training (research methods students) versus less scientific training (introductory psychology students). This is theoretically relevant, given our claim that it is participants' understanding of the use of these hedges and not simply the presence of hedges that guides whether they undermine persuasive attempts. To examine this, we conducted a set of 3 (editorial condition) × 2 (course: introductory psychology, research methods) between-subjects ANOVAs on each of the four variables examined above. In addition to the effects described above, a significant Condition × Course interaction emerged on participants' evaluations of the source of the editorial, $F(2, 144) = 3.11$, $p < .05$ (see Figure 1). Although Tukey post hoc tests did not reveal any significant differences between meaningful groups, we calculated several effect sizes (Cohen's d) to examine the magnitude of differences between group means. First, a moderate effect size ($d = 0.65$) emerged when research methods students' source ratings in the control condition were subtracted from those of introductory psychology students' source ratings. When hedges were absent from the editorial, participants with more scientific training ($M = 4.45$, $SD = 0.70$) provided somewhat more negative evaluations of the source than participants with less scientific training ($M = 5.05$, $SD = 1.11$). We also calculated effect sizes comparing evaluations between the data and interpretation placement for each group of individuals. Among individuals with less scientific training, the effect size was very small when ratings of data hedges were subtracted from ratings of interpretation hedges, ($d = 0.04$). However, a large effect size emerged for individuals with more scientific training ($d = 0.82$). These individuals evaluated the source more positively when the hedges were placed on interpretation statements ($M = 4.69$, $SD = 0.92$) than when they were placed on data statements ($M = 3.83$, $SD = 1.18$). Although these results were not anticipated, they suggest that knowledge of the use of hedges and their meaning in argumentation might develop as individuals advance their scientific training.

Overall, these data lend consistent support for the idea that it is not solely the presence of hedges that undermines the effects of a persuasive message but instead

Figure 1
Interaction of Editorial Condition and Course on Perceptions of the Source (Experiment 1)



the particular placement of hedges in relation to statements of research results. These data suggest that a more fine-grained analysis is warranted when examining the specific aspects of a persuasive message.

Experiment 2

The results of the first experiment indicated that hedges placed in interpretation statements did not undermine persuasive attempts in terms of reports of attitudes, perceptions of the source, or evaluations of the arguments. However, it is noteworthy that the means for the interpretation hedge condition consistently fell between those of the control and data interpretation conditions, suggesting that the editorial containing interpretation hedges was not evaluated as positively as the editorial containing no hedges. One explanation of this could be that all of the hedges used in Experiment 1 were colloquial (e.g., sort of, kind of) rather than hedges that are more typically found in scientific writing. It is possible that the presence of professional hedges (those

found in academic writing) on interpretation statements might lead to more effective persuasion than the absence of hedges because they acknowledge the possible limits on otherwise absolute claims. The purpose of the current experiment was to test whether the type of hedge (either colloquial or professional) affected message perception, holding constant the placement of hedges in interpretation statements. We hypothesized that professional hedges would increase the effects of a persuasive message on attitudes, perceptions of the source, and evaluations of the argument relative to colloquial hedges, which should be perceived as powerless language. Furthermore, given the results of Experiment 1 suggesting that individuals with more scientific training are more aware of the utility of hedges on interpretation statements, Experiment 2 was conducted only with introductory psychology students. However, to further examine the effect of scientific training on responses to the use of hedges, we assessed scientific reasoning ability to test more directly how individual differences might influence the effects of hedges on persuasive attempts.

Method

Participants. One hundred forty-nine introductory psychology students at a Midwestern university participated for course credit. The mean age of participants was 18.69 (SD = 1.54). The sample comprised 66% women and 34% men, and two participants did not indicate their gender. The sample included participants who identified themselves as African American (17%), Asian or Asian American (7%), Hispanic (7%), Native American (1%), Arabic or Middle Eastern (3%), and White (64%). One percent of participants did not report their racial or ethnic background.

Materials. The editorial used in the control condition in the second experiment did not contain hedges and was the same as that used in the first experiment. The editorials used in the experimental conditions contained hedges but differed in the type of hedge used. For the professional hedges condition, six hedges commonly found in research articles—may (two), probably (two), seem to (one), likely(one)–were selected from the list compiled from Horn (2001). For the colloquial hedges condition, six hedges were used that were not common in research articles—sort of (two), kind of (two), somewhat (one), possibly (one). Five of the six hedges were used in the studies of Blankenship and Holtgraves (2005). The text with professional hedges contained 296 words, the text with colloquial hedges contained 299 words, and the control text contained 290 words. The Flesch–Kincaid reading grade level of each of the three texts was 12.

Participants' reports of attitudes about the policy, perceptions of the source, evaluations of the argument, and manipulation check items were assessed in the same way as in Experiment 1.

In addition, a measure of scientific reasoning was included to test more directly the post hoc finding from Experiment 1 that suggested that individuals with more or

less scientific training responded differently to the hedges. The measure of scientific reasoning consisted of 10 questions that had been developed by Lawson (2000).

Design and procedure. This experiment was a one-way, three-cell design. Participants were randomly assigned to one of three editorial conditions (no-hedge control condition, colloquial hedge condition, or professional hedge condition). Scientific reasoning was measured as a continuous variable and used as another factor in analyses. The dependent variables included attitudes about the policy, perceptions of the source, and evaluations of the argument strength.

The procedure for Experiment 2 was identical to that of Experiment 1 except that when participants finished the postexperimental questionnaire they received a packet containing the scientific reasoning measure.

Results and Discussion

Multiple regression was used to analyze these data to test the effects of hedge type and scientific reasoning as a continuous variable. A pair of dummy codes was constructed to capture differences between experimental conditions. One code compared the control condition (0) and the colloquial hedge condition (1), and the other code compared the control condition (0) and the professional hedge condition (1). Scientific reasoning was mean centered prior to analyses and was entered as a continuous variable. Moreover, two interaction terms were constructed between each dummy code and scientific reasoning. The two dummy codes and scientific reasoning were entered on the first step and the two interaction terms were entered on the second step. Unstandardized coefficients are reported for each analysis. The dependent variables were the same as those used in Experiment 1: the manipulation check, attitudes toward the policy, perceptions of the source, and evaluations of the argument quality.

First the five-term regression model was used to predict variability in the manipulation check. When the main effect variables were entered on the first step, the only significant effect was the dummy code comparing the control condition to that of the colloquial condition, $t(145) = -4.60$, $p < .01$, $B = -1.00$. Participants in the control condition ($\hat{Y} = 5.53$) perceived the language in the editorial to be more professional than did participants in the colloquial condition ($\hat{Y} = 4.53$), suggesting that the manipulation of colloquial hedges had its intended effect on the manipulation check. Notably, there was no reliable difference between the control condition and the professional hedge condition on this variable, suggesting that participants evaluated the language in the control and professional hedge conditions similarly. When the interaction terms were entered on the second step, only a marginally significant interaction of scientific reasoning and the control versus colloquial dummy code emerged, $t(143) = 1.89$, $p = .06$, $B = 2.03$.

Next, the regression model was used to predict variability in attitudes toward the policy. The first step of the analysis yielded one marginally significant effect of the

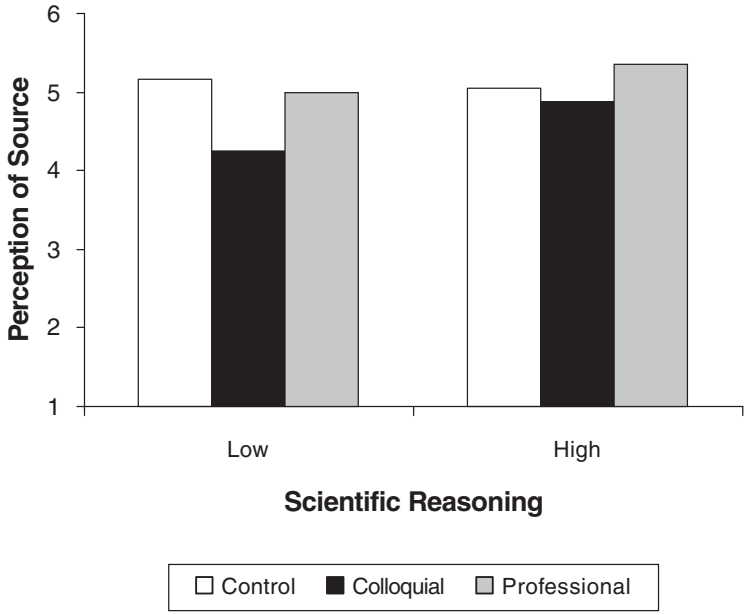
dummy code comparing the control condition to the colloquial hedge condition, $t(145) = -1.74$, $p = .08$, $B = -.44$. Paralleling the effect seen on the manipulation check, but much weaker, participants in the colloquial condition ($\hat{Y} = 4.55$) reported somewhat lower attitudes toward the policy than participants in the control condition ($\hat{Y} = 4.99$). The interaction terms were not significant when entered on the second step. Taken together, this analysis indicates that colloquial hedges have a weak effect, if any, on actual attitudes compared with no hedges, and that this effect was not moderated by scientific reasoning skills. Thus, when hedges are in an appropriate location (interpretative statements), colloquial hedges are not less persuasive.

When the regression model was used to predict perceptions of the source of the editorial, a strong negative effect of the control versus colloquial dummy code emerged, $t(145) = -2.95$, $p < .01$, $B = -.53$. This effect showed that participants perceived the source more negatively in the colloquial condition than in the control condition. There was also a positive effect of scientific reasoning, $t(145) = 2.19$, $p < .05$, $B = .78$, suggesting that individuals with higher scientific reasoning skills evaluated the source of the editorial more positively than those with lower scientific reasoning skills. However, these main effects were qualified by a significant interaction between scientific reasoning and the control versus colloquial dummy code, $t(143) = 2.07$, $p < .05$, $B = 1.82$. Simple slope analyses were conducted to examine the control versus colloquial effect separately for individuals who scored one standard deviation below and above the mean of scientific reasoning (see Figure 2). Individuals with low scientific reasoning ability evaluated the writer of the message containing colloquial hedges more negatively than the writer of the control message, $t(143) = -3.56$, $p < .01$, $B = -.91$. However, individuals with high scientific reasoning skills perceived the writer of the message in the control and colloquial conditions similarly, $t(143) = -0.65$, $p = .52$, $B = -.16$. This interaction indicates that individuals with high scientific reasoning ability are more accepting of a writer who uses colloquial hedges than are individuals with low scientific reasoning ability. Moreover, individuals with low scientific reasoning ability appear to have used the type of hedge (rather than the presence of a hedge) as a way to evaluate the writer. Given that the hedges appeared on interpretation statements in both experimental conditions in this study, it might be the case that individuals with low scientific reasoning skills used the appropriateness of the language as a heuristic in evaluating the writer.

Finally, the regression model was used to predict perceptions of the argument quality. This analysis yielded only a significant effect of the control versus colloquial dummy code, $t(145) = -2.81$, $p < .01$, $B = -.63$. This effect indicated that participants in the colloquial condition ($\hat{Y} = 4.68$) evaluated the argument more negatively than did participants in the control condition ($\hat{Y} = 5.31$).

The results of this study suggest overall that the type of hedge used is important for how the message is perceived and how the source of the message is evaluated. Colloquial hedges negatively affected perceptions of the source and evaluations of the

Figure 2
Interaction of Editorial Condition and Scientific Reasoning on Perceptions of the Source (Experiment 2)



message relative to the control condition. Interestingly, and contrary to our hypothesis, the presence of professional hedges did not enhance perceptions of the source or argument compared with the control condition. This could be explained by the generally low level of scientific training for participants overall. Recall that all participants in this study were introductory psychology students. Although we assessed scientific reasoning ability, it is unknown whether these individuals had extensive scientific training. Had these individuals been more advanced students (e.g., graduate students in the sciences), it is possible that participants' source evaluations in the professional hedge condition would have exceeded those in the control condition.

Finally, scientific reasoning did play a small role in how participants responded to hedges, evidenced in participants' evaluations of the source. Whereas individuals with low scientific reasoning evaluated the source more negatively in the colloquial hedge condition (even though the hedges were placed in interpretation statements), individuals with high scientific reasoning did not negatively evaluate the source in the colloquial hedge condition.

General Discussion

The data obtained in the current experiments replicate and extend research by Blankenship and Holtgraves (2005) indicating that hedges in arguments can serve as cues for both central and peripheral route processing of persuasive messages. They argued that hedges might undermine the argument quality because hedges denote powerlessness, thereby weakening strong arguments as well as undercutting source credibility. We concur that hedges can weaken strong arguments if the hedges accompany statements of research results, presumably because research results should otherwise be unambiguous. Consistent with the results of Blankenship and Holtgraves (2005), we found in Experiment 1 that arguments with hedges placed primarily on statements of research results (data statements), compared with arguments with no hedges, led to less persuasion, more negative evaluations of the argument, and less favorable perceptions of the source. However, we also found that hedges do not undermine the effects of persuasive arguments if used judiciously, namely, on statements that interpret results. Unique to the current research, when the same hedges that were placed on data statements were placed instead on interpretation statements, they did not have such negative effects. Given that hedges were present in both experimental conditions, these data lend direct support for the idea that the placement of hedges can change the meaning of arguments in a persuasive message.

The extent to which hedges affect persuasion was further tested in Experiment 2. Although all hedges in Experiment 2 were placed on interpretation statements, the appropriateness of the language of the specific hedges was varied. We contend that the presence of colloquial versus professional hedges in the experimental conditions did not drastically change the meaning of the message because hedges in both cases were used to qualify the interpretation of research results. However, the results showed that the colloquial hedges led to lower evaluations of the argument than no hedges, whereas the professional hedges did not differ from the control. Participants apparently perceived the colloquial language as reducing the strength of the argument although the colloquial language did not dampen persuasion, as attitudes were similar across the experimental conditions.

It is important to examine the general context in which participants were exposed to the persuasive arguments in the current experiments and to consider the limits of generalizing these results to other situations. Specifically, participants believed that the topic was relevant to them (the policy was to be implemented at their university the following year) and had unlimited time to read (and perhaps re-read) the argument before providing evaluations. These conditions have been found in prior research to maximize the extent to which participants are motivated and able to pay attention to aspects of the argument when making their evaluations (Eagly & Chaiken, 1993). Consequently, these conditions might have increased the chances of obtaining the results reported here. Although this is an important first step in examining the effects

of language nuances in persuasive communication, it will be important to test and define the boundary conditions for these effects in future research. For example, it is possible that these effects will be smaller or nonexistent if participants were less motivated or less able to attend to the persuasive message.

One implication of these results is a more nuanced view of the effect of hedges on perceptions of speakers and messages. As Blankenship and Holtgraves (2005) point out, this hedge effect is a complex one. Under some circumstances, hedges are considered powerless. The current experiments show that colloquial hedges and hedges on data statements lead to a negative perception of a message and its source. The current research also shows, however, that professional hedges and hedges on interpretative statements do not lead to negative perceptions.

Although we have varied here the placement and type of hedges, a rich area for future work surrounds the extent to which these variables change depending on the social context (e.g., formal vs. informal settings, communication between individuals with higher and lower social status). For example, the cover story and the form of the editorials used in Experiment 2 likely suggested to participants that the arguments favoring comprehensive exams were coming from the university administration. As such, the presence of colloquial hedges in an argument from a formal committee might have seemed especially inappropriate. In contrast, had the argument been more casual, perhaps coming from a fellow student, the effects of colloquial hedges might have been less negative.

Other factors related to the social relationships of individuals in the communication may also influence hedge perception and these should also be examined in future research. For example, even colloquial hedges may be viewed positively when one is using them for politeness (Simpson, 1990) as in Claim 4.

4. Maybe you could read my dissertation this week.

In situations where a person is attempting to convince another of an assertion, especially if the other is of higher status or if the message is counterattitudinal, it is seen as polite to give the person the feeling that the assertion is not a command. Hedges used in this way provide the audience the opportunity to reject or disagree with the assertion. In this case, the hedge may actually be viewed positively and lead to greater persuasion. It would be useful to vary simultaneously the use of hedges and the social roles of the sources of persuasive communication to test whether the effects of using hedges are sensitive to such social cues.

Another case where hedges may be viewed as more appropriate than an absolute unhedged statement is when a counterexample is easily accessable. For example, the audience may perceive the speaker of an assertion such as Claim 5 as either unknowledgeable or deceptive if counterexamples (e.g., Bill Gates) easily come to mind or if the definition of success is questioned.

5. One needs a college degree to be successful in life.

This suggests that the effects of using hedges might vary depending on the message itself. An exciting area of research would be to vary the use of hedges as well as the extent to which the message conveyed ideas that are easily refutable versus more ambiguous. Absolute statements might backfire if the message is inconsistent with popular thought, but be beneficial if the message is consistent with the current zeitgeist.

In addition to contextual factors, there may also be factors of the individual that lead to different perceptions of hedges and these should be tested. One such factor was scientific reasoning. The effects found in both studies suggest that individuals with less scientific reasoning ability or training might be more likely to use colloquial hedges as peripheral cues in evaluating sources. In Experiment 1 these individuals evaluated the source in both experimental conditions similarly and more negatively than the control condition—that is, all of the hedges were colloquial in Experiment 1. However, given the results of Experiment 2, the results of Experiment 1 might have emerged because individuals with low scientific training were responding to the colloquial nature of the hedges (not just the presence). In contrast, individuals with high scientific reasoning rated the writer similarly high if the hedges were colloquial or professional, suggesting that they may recognize the semantic utility of hedges. In the persuasion literature, it is often suggested that individuals will evaluate arguments more carefully if individuals are both motivated and able to do so (Chaiken et al., 1989; Petty & Cacioppo, 1986). Much research along these lines has focused on need for cognition (tendency to think hard and actively about argument quality) and cognitive resources (lack of distractions from attending to argument quality) as important individual difference variables. Although the current research found only moderating effects of individual differences on source evaluations, these results extend this line by showing that ability to attend to argument strength might rest in cognitive skills and abilities in addition to motivation and cognitive resources.

Note

1. The materials used in these experiments are available from the authors.

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