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Causal uncertainty and correction of judgments

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Abstract

We examined whether raising uncertainty about the causes of one's judgments motivates correction. Specifically, we examined whether activating chronically accessible causal uncertainty (CU) beliefs with a conditional warning about possible bias enhances correction of weather judgments for tropical weather primes and of word frequency judgments for the availability bias. In two studies we showed that activating chronic beliefs led to careful correction of target judgments. Moreover, Study 2 revealed that chronically high CU individuals who received a conditional warning felt more uncertain than did other participants, but that this uncertainty was suppressed somewhat by adjusting for the bias. Results are discussed in light of recent models of judgment correction (e.g., Wegener & Petty, 1997), and the causal uncertainty model (Weary & Edwards, 1996).

Causal Uncertainty and Correction of Judgments

Every day, teachers continuously evaluate their students, senior faculty members formally and informally evaluate their junior colleagues, and screening personnel evaluate the risk-potential of airline passengers. We often are interested in making good, or unbiased, judgments in such cases, and sometimes even in matters that are less consequential. For example, we may want to know that the travel brochures we received in the mail have not biased our judgments about possible vacation sites. But how do we know our judgments are good ones? The answer seems to be that often we do not. In many instances there simply are few reliable or salient external or internal cues suggestive of bias (Wilson & Brekke, 1994).

Questions such as the one posed above recently have led many investigators to focus on factors that might instigate the search and correction for unwanted influences on judgments (e.g., Martin, Seta & Crelia, 1990; Schwarz & Bless, 1992; Weary, Tobin, & Reich, 2001; Wegener & Petty, 1995; Wilson & Brekke, 1994). In the current research, we examined one such factor. Specifically, we examined how individual differences in causal uncertainty relate to judgmental correction processes.

The Causal Uncertainty Model

People often strive to perceive and understand reality accurately (Berlyne, 1962; Festinger, 1954; Kagan, 1972), and their causal analyses of events are central to this pursuit. The causal uncertainty model (Weary & Edwards, 1994; 1996) addresses what happens when perceivers come to doubt their ability to make sense of events. The model suggests that some people possess chronically accessible beliefs (c.f., Edwards & Weary, 1998; Jacobson, Weary & Edwards, 1999), beliefs that they might not adequately understand or be able to detect the causes of events, including behavior and subjective experiences of the self or others. Moreover, it suggests that such beliefs are easily activated by various situational factors (e.g., unexpected or negative events, instructions to focus on the causes of events, even situational information relevant to causal analyses).

The model further argues that when causal uncertainty (CU) beliefs are activated, they give rise to feelings of surprise, bewilderment, or confusion that alert perceivers to the inadequate state of their current causal knowledge. They also are thought to automatically activate a goal of accurate causal understanding and various strategies to achieve that goal. Such strategies are thought often to entail a careful search for and processing of diagnostic information (Edwards, 1998; Weary & Jacobson, 1997; Weary et al., 2001) and to result in a reduction of uncertainty feelings.

To date, investigations have examined the strategies employed by perceivers only in response to activation of uncertainty about others' behaviors. The current research extends the role of causal uncertainty to perceivers' understandings of their own experiences. Specifically, we examine whether causal uncertainty motivates correction when the situation subtly calls into question the causes of perceivers' judgments.

The Current Research

Numerous models propose that people use metacognitive theories of bias when attempting to correct their judgments for unwanted influences (e.g., Wegener & Petty, 1995; Wilson & Brekke, 1994). In particular, the flexible correction model (Petty and Wegener, 1993, 1997; Wegener & Petty, 1995) proposes that individuals use naïve theories about how various contexts influence target judgments. As a demonstration of this point, Petty and Wegener (1993; Wegener & Petty, 1995) showed that individuals tend to believe that thinking about the weather in tropical vacation spots makes the weather in Midwestern locations seem less desirable. When explicitly instructed to correct for the biasing effect of the “vacation locations” context (without being told what the direction of that bias was), participants adjusted their judgments away from the direction of bias.

In an extension of Petty and Wegner’s research, Stapel, Martin and Schwarz (1998) presented participants with a subtle or salient contextual bias and then gave some participants a warning about the possibility that their judgments were contaminated. Blatantly warning participants not to let the context influence their judgments led to correction, regardless of whether the bias was salient or subtle. By contrast, conditionally warning participants, by telling them that their judgments might be biased and that they should correct them if necessary, led to correction for the salient bias only. Because the corrections seemed to require either a blatant warning or a salient source of bias, Stapel et al. concluded that corrections for contextual biases do not come easily.

We believe, however, that correction attempts might come more easily for some people than for others. More specifically, we believe that people who possess chronically accessible causal uncertainty beliefs might be more likely to have those beliefs activated by a subtle, conditional warning of bias, and as a result they might be more vigilant and more motivated to detect and remove unwanted influences on their judgments. Moreover, they might be better at making judgmental corrections (i.e., they might have highly proceduralized and well-calibrated correction strategies).

Pilot Studies

In two pilot studies, we examined whether individual differences in causal uncertainty might be confounded with differential theories about the biasing contexts (Pilot Study A) or with differential extremity and certainty of the target judgments (Pilot Study B) employed in the current research. In Pilot Study A, participants reported how they thought being in one's dream vacation spot would influence judgments about the pleasantness of an ordinary location (-4 = *would make it seem less pleasant*; +4 = *more pleasant*). They also reported how finding it easier to recall r-first than r-third words would affect a related frequency estimate (-4 = *make it seem like there are many more 3rd letter "r" words*; +4 = *many more 1st letter "r" words*). Participants believed that being in the location of one's dream vacation would make ordinary locations seem less pleasant (M = -2.34, $t(28)$ = -7.34, p < .001). Also, they believed that harder to recall words would seem less frequent than easier to recall words (M = -1.72, $t(28)$ = -4.73, p < .001). Finally, their Causal Uncertainty Scale (CUS, described in Study 1) scores (n = 29; CUS M = 38.10) were unrelated to either theory of bias (ps > .75).

Participants in Pilot Study B rated the desirability of the weather in Indianapolis, Kansas City, and Des Moines (1 = *not at all desirable*; 9 = *very desirable*). They also estimated the relative frequency of r-first and r-third words in the English language (1 = *many more words with "r" as first letter*; 9 = *many more words with "r" a third letter*) and rated how confident they were in each answer (1 = *not at all confident*; 9 = *extremely confident*). Weather ratings were at or significantly below the scale midpoint (Ms = 4.35 to 4.89, $t(36)$s = -.45 to –2.20, ps > .03). Word frequency judgments (M = 3.84) were significantly below the scale midpoint ($t(36)$ = -3.45, p = .001), indicating the expected availability bias. Confidence ratings for each judgment were moderate (Ms = 4.35 to 4.89, $t(36)$s = -1.18 to –1.98, ps > .05). CUS scores (n = 37, CUS M = 37.38) were unrelated to any of the ratings (ps > 20).

Thus, individual differences in causal uncertainty were unrelated to intuitions about the biasing contexts we used, and to certainty or extremity of our target judgments. Individuals generally were moderately confident in these judgments and had naïve theories of bias that were consistent with prior research (Petty & Wegener, 1993; Tversky & Kahneman, 1973)

Study 1

In Study 1 we examined how activating causal uncertainty beliefs influences correction of weather desirability judgments. We expected that a conditional warning would subtly activate CU beliefs, especially among participants chronically high in CU. Thus, high CU participants who received a conditional warning should be most likely to correct their judgments.

Method

Participants and Design

One hundred ninety-five Introductory Psychology students were randomly assigned to a warning condition (none vs. conditional). Additionally, 49 participants in a non-factorial control condition (run at the same time) rated the target stimuli without having been exposed to the contextual stimuli. All participants received course credit for participation.

Causal Uncertainty Scale

The CUS (Weary & Edwards, 1994) is a 14-item scale that measures the frequency and strength of doubts about one's ability to understand the causes of behavior or experiences. Items are scored on a 1-6 scale and summed to form an index, with higher numbers indicating more causal uncertainty. Research has shown that the CUS has high internal consistency (Cronbach's alpha = .83), and good construct validity (Weary & Edwards, 1994; 1996). The mean CUS score in Study 1 was 35.64 (SD = 10.08). Regressing CUS scores on effects-coded warning condition (-1 = *no warning*; 1 = *conditional warning*) revealed no condition effect ($p > .20$).

Procedure

Judgment task. Participants learned that they would be completing materials for several researchers during the session (all materials were for the current experiment). The first packet of materials was entitled "Judgments of Locations" and was similar to that used by Stapel et al. (1998, pp. 800 - 801) and by Wegener and Petty (1993, p. 41). On the first page, participants read the following introduction for the experiment (from Stapel et al.):

> This study is part of a larger research project that looks at the different ways in which people evaluate and judge locations, such as parks, cities, and countries. In this research project, we use several questionnaires to assess people's perceptions and evaluations of all sorts of locations.

Following exposure to the contextual stimuli (i.e, thinking about the Bahamas, Hawaii, and Jamaica), half of the participants rated the desirability of the weather in Midwestern locations: Indianapolis, Kansas City, and Des Moines. The others read a conditional warning before completing their target ratings. The warning (Stapel et al., 1998) asked participants to:

> Please try to make sure that your ratings of the desirability of the weather in the locations below reflect your true response. When you feel there is something that may have an unwanted influence on your ratings, please try to adjust for that influence.

Participants in the control group rated the stimuli without being exposed to the bias or the conditional warning. [1]

Filler task. After completing the first set of materials, participants received a questionnaire entitled "Health Status of College Undergraduates". In it, they reported various health-relevant behaviors and rated the likelihood of experiencing health problems in the future. The questionnaire took 5-7 minutes to complete.

Individual difference measures. The final set of materials was entitled “Psychology Department Scaling Study.” Its ostensible purpose was to check the reliability and validity of several (untitled) personality scales. Of interest for the current experiment was the CUS, which was counterbalanced with the other scales between participants.

Results and Discussion

Desirability ratings of the three midwestern targets were averaged to form a single index (Cronbach's alpha = .75). Because thinking about tropical vacation spots usually makes the weather in Midwestern locations seem worse by comparison, more favorable weather ratings would indicate correction for the tropical weather primes.

The warning variable was effects coded (-1 = *no warning*, 1 = *conditional warning*), and CUS scores were standardized (to minimize problems with multicollinearity between continuous predictors and related interaction terms; Aiken & West, 1990; West, Aiken & Krull, 1996). Because standardizing an effects-coded predictor could introduce bias into resulting coefficients (Cohen & Cohen, 1983), the dependent variables also were standardized so *B*s could be interpreted as βs.

Control Condition

In the control (no bias, no warning) condition, CUS scores were unrelated to weather judgments, $r = .01$, $p > .90$. Judgments were not significantly different from the midpoint of the scale ($M = 4.86$; $t(48) = -.79$, $p > .40$), or from weather ratings in Pilot Study B ($t(84) = -1.17$, $p > .20$).

Experimental Conditions

Simultaneously regressing the Midwestern cities index onto CUS scores, the warning variable, and the interaction term revealed a significant CUS X Warning interaction; $\beta = .20$, $t =$

2.43, $p = .01$. As expected, causal uncertainty was unrelated to correction when participants received no warning about a possible influence on their judgments; causal uncertainty simple slope $\beta = -.06$, $t = -0.59$, $p > .55$. However, it was positively related to correction when participants received a conditional warning; causal uncertainty simple slope $\beta = .32$, $t = 2.88$, $p = .004$. Figure 1 displays these results at $\pm$ 1 and 2 *SDs* from the mean of CUS (to represent most of the range of CUS scores), and the mean target rating in the control condition.

Another way to look at the interaction is to focus on the differences between the two lines at $\pm$ 2 *SD*s from the mean of CUS, to examine the impact of the warning manipulation on the highest and lowest CU participants. The difference between warning and no warning conditions was significant at two *SD*s above the mean of CUS; simple slope for warning $\beta = .46$, $t = 2.82$, $p = .005$. By contrast, the difference between the warning and no warning conditions was not significant at two *SD*s below the mean of CUS; simple slope for warning $\beta = -.29$, $t = -1.79$, $p > .05$.

Insert Figure 1 about here

The results of Study 1 thus supported our hypothesis: when participants received a conditional warning, causal uncertainty was positively related to correction. These results suggest that activating uncertainty about the causes of one's judgments motivates correction of judgments. Additionally, they suggest that high-CU individuals might take a relatively tentative approach to correction, as they did not overcorrect (c.f. Stapel et al., 1998). Alternatively, the lack of overcorrection might reflect a remarkable sensitivity to the direction and degree of bias on the part of high-CU individuals. One purpose of Study 2 was to examine these possibilities.

Study 2

We had two primary objectives for Study 2. One was to test the generalizability of the Study 1 results by examining correction of word frequency judgments for the biasing effect of the availability heuristic (Tversky & Kahneman, 1973). The availability heuristic is the rule of thumb by which one bases frequency, likelihood, or typicality judgments on the ease of bringing relevant information to mind. For example, if people rely on the availability heuristic to judge the relative frequency of r-first and r-third words, they will erroneously conclude that r-first words are more common (e.g., Tversky & Kahneman, 1973; Wanke et al., 1995).

Our second objective was to examine whether adjusting judgments away from the direction of bias would reduce uncertainty feelings, especially for high CU people who receive a conditional warning. The CU model suggests that if using correction strategies helps one perceive that one is making more accurate judgments, attempted correction should reduce uncertainty feelings. However, because it is generally difficult to determine whether one has accurately identified a potential bias or corrected sufficiently for it (e.g., Martin & Stapel, 1998; Petty & Wegener, 1993; Sommers & Kassin, 2001; Wegener & Petty, 1995, 1997; Wilson & Brekke, 1994), correction should result in only a partial reduction.

Method

Participants and Design

Seventy-three Introductory Psychology students were randomly assigned to either a no warning or a conditional warning condition. All participants received course credit.

Causal Uncertainty Scale

The mean CUS score for the sample was 35.38 ($SD = 11.56$). There was no significant effect of warning condition on CUS scores ($p > .60$).

Procedure

Judgment task. Participants learned that they would be completing materials for several researchers during the session (all were for the current experiment). Instructions for the first packet of materials indicated that the study concerned the influence of several variables on language production (Wanke et al., 1995). On the first page, participants were asked to write down ten words that had "r" as their first letter and to rate the difficulty of that task (1 = *not at all difficult*; 8 = *extremely difficult*). On the second page, they were asked to write down ten words that had "r" as their third letter and to rate the difficulty of that task.

Next, participants learned that they would receive some follow-up questions about the language production tasks. Participants in the conditional warning condition read that they should make sure their answers were unbiased, and that when they felt there was something that may have had an unwanted influence on their answers, they should try to adjust for that influence. All participants then estimated the relative frequency of r-first and r-third words in the English language (1 = *many more 3rd letter "r" words*; 9 = *many more 1st letter "r" words*). Finally, to support the cover story, we asked participants several questions about variables supposedly related to verbal abilities (e.g., their major, handedness).

First filler task. After completing the first set of materials, participants received a packet entitled “Perceptions of Animals” in which they rated their perceptions of various animals’ sizes. This questionnaire took about 3 minutes to complete.

Measures of uncertainty feelings. Next, participants completed a “pilot study” about current feelings. Among the 8 items were several assessing their current feelings of uncertainty: "I feel uncertain", "I feel confident" (reversed), and "I feel satisfied" (reversed), "I feel unsure" (1 = *not at all ...;* 9 = *extremely...*). The uncertainty-related items were highly related (Cronbach's alpha = .82) and were averaged to form an index of uncertainty feelings. Higher scores indicated greater uncertainty.

Second filler task, and individual difference measures. Next, participants completed a 5-minute “Consumer Survey” in which they reported their favorite brand (of toothpaste, shampoo, fast food, etc.), how many times a month they had purchased it, and why they preferred it (price, quality or other). Finally, participants completed the “Psychology Department Scaling Study” used in Experiment 1, which contained the (untitled) Causal Uncertainty Scale.

Results

As in Study 1, the warning variable was effects coded (-1 = *no warning*, 1 = *conditional warning*). Additionally, CUS scores and the dependent variables were standardized.

Experienced Difficulty

A paired-samples *t*-test run on participants' ratings of the experienced difficulty of recalling r-third and r-first words showed that participants found r-third words more difficult to recall (M = 4.08) than r-first words (M = 2.08), $t(72) = -8.99$, $p < .001$. Simultaneously regressing the difference between the r-third and r-first difficulty ratings on CUS, the warning variable, and their interaction revealed no significant effects (*p*s > .35).

Frequency Estimates

We expected that when participants received a conditional warning, those higher in CU would be more likely to correct their judgments for the observed availability bias. Simultaneously regressing participants' frequency estimates onto their CUS scores, the warning variable, and the interaction term revealed the predicted CUS X Warning interaction; $\beta = .35$, $t = 2.98$, $p = .004$ (see Figure 2). Subsequent analyses indicated that under a conditional warning, CUS and correction were positively related; CUS simple slope $\beta = .40$, $t = 2.19$, $p = .03$. In the no warning condition, there was an unexpected**,** negative relationship between CUS and adjustment; CUS simple slope $\beta = -.35$, $t = -2.03$, $p = .05$. The difference between warning and no warning conditions was significant at two standard deviations above the mean of CUS; simple slope for warning $\beta = .82$, $t = 3.16$, $p = .002$. Likewise, the difference between the warning and no warning conditions also was significant at two standard deviations below the mean of CUS; simple slope for warning $\beta = -.56$, $t = -2.20$, $p = .03$. Figure 2 displays these results at $\pm$ 1 and 2 *SD's* from the mean of the CUS.

Insert Figure 2 about here

Uncertainty Feelings

We simultaneously regressed the index of uncertainty feelings onto participants' CUS scores, the warning variable, and the interaction term. Overall, higher CU participants reported stronger feelings of uncertainty; $\beta = .54$, $t = 5.12$, $p < .001$. This was not unexpected because uncertainty feelings are typical for high CU individuals (Weary & Edwards, 1996). However, this effect was qualified by a CUS X Warning interaction; $\beta = .25$, $t = 2.33$, $p = .02$ (see Figure 3). As expected, the relationship between causal uncertainty beliefs and feelings of uncertainty was more pronounced among the participants who received the conditional warning (simple slope for causal uncertainty $\beta = .79$, $t = 4.70$, $p < .001$) than among participants who received no warning (simple slope for causal uncertainty $\beta = .30$, $t = 2.28$, $p = .03$).

Focusing on the differences between the two lines at $\pm$ 2 *SD*s from the mean of CUS shows that a conditional warning activates a stronger state of uncertainty among individuals with more chronically accessible CU beliefs. The difference between warning and no warning lines was significant at two *SD*s above the mean of CUS (simple slope for warning $\beta = .56$, $t = 2.37$, $p = .02$), but not at two *SD*s below the mean of CUS (simple slope for warning $\beta = -.42$, $t = -1.82$, $p > .05$).

Insert Figure 3 about here

Alleviation of Uncertainty Feelings

Among high CU participants who received a conditional warning, correction of judgments should partially suppress uncertainty feelings. We did not expect such suppression in the no warning condition. Accordingly, we carried out separate tests for suppression effects (cf. analysis of mediation, Baron & Kenny, 1986) in the warning and no warning conditions.

Warning condition. An initial regression analysis showed that CUS scores were significantly related to feelings of uncertainty, $\beta = .79$, $t = 4.99$, $p < .001$. A separate regression analysis revealed that CUS scores were significantly related to adjustment of judgments away from the direction of bias (the hypothesized suppressor), $\beta = .40$, $t = 2.12$, $p = .04$. Next, a simultaneous regression of uncertainty feelings on CUS scores and adjustment of judgments showed that adjustment was significantly related to feelings of uncertainty, $\beta = -.30$, $t = -2.19$, $p = .04$. Moreover, causal uncertainty and feelings of uncertainty were more strongly related after controlling for the suppressor, $\beta = .89$, $t = 5.67$, $p < .001$. This partial suppression effect was significant, Sobel test (1982) $Z = -1.45$, $t = -1.85$; one-tailed $p < .05$ (See Figure 4).

Insert Figure 4 about here

No warning condition. An initial regression analysis showed that CUS was significantly related to uncertainty feelings, $\beta = .30$, $t = 2.16$, $p = .04$. A separate regression analysis revealed that CUS was negatively related to adjustment of judgments away from the direction of bias, $\beta = -.29$, $t = -2.11$, $p = .04$. Next, a simultaneous regression of uncertainty feelings on CUS and adjustment of judgments showed that adjustment was not significantly related to feelings of uncertainty, $\beta = -.03$, $t = -0.18$, $p > .85$. Moreover, the relationship between CUS and uncertainty feelings remained essentially unchanged, $\beta = .29$, $t = 1.94$, $p = .06$ (See Figure 5). As expected, then, adjustment of judgments by these participants did not suppress the relationship between CU beliefs and uncertainty feelings.

Insert Figure 5 about here

Discussion

Study 2 provided additional evidence that activating causal uncertainty about one's judgments motivates correction. Here, though, even the highest CU individuals undercorrected for bias. Thus, it appears that high CU individuals take a careful, tentative, but not perfectly calibrated approach to correction. This finding might not be surprising, given that salient and reliable bias cues are rare (e.g., Wilson & Brekke, 1994) and that CUS is unrelated to the theory of bias investigated in Study 2.

The results of Study 2 also showed that the corrections made by high CU participants partially alleviated their uncertainty feelings. Such findings are particularly important because they might help to explain the persistence of chronic CU beliefs and feelings. That is, perceivers often might be unable to know for sure whether their causal assessments and corrections based on them are completely adequate. Moreover, this might be particularly troubling for high-CU individuals who theoretically would be expected to be more sensitive to discrepancies between current and desired states of causal knowledge.

Before concluding, we should note that we ran a follow-up study to see whether the negative relationship between chronic causal uncertainty beliefs and target judgments in the no warning condition of Study 2 would replicate. In that study, 41 Introduction to Psychology students participated in the same procedure as in the no warning condition of Study 2. The mean frequency estimate in this study ($M = 3.39$) was significantly lower than the midpoint of the scale, again indicating the availability bias; $t(40) = -6.34$, $p < .001$. However, the unexpected relationship between causal uncertainty and target judgments did not replicate, $\beta = -.13$, $t = -0.86$, $p > .35$. Thus, the unexpected evidence of correction by low causal uncertainty-no warning participants in Study 2 might well have been a chance finding.[3]

General Discussion

The current research is the first to show that implications of the causal uncertainty model hold when the target of uncertainty concerns one's self and subjective experiences (cf. Edwards, 1998; Vaughn, Weary & Edwards, 2000; Weary & Edwards, 1994; Weary & Jacobson, 1997). It also extends recent models of judgmental correction processes (e.g., Martin, Seta & Crelia, 1990; Schwarz & Bless, 1992; Wegener & Petty, 1997; Wilson & Brekke, 1994) by showing that activating chronic CU beliefs (in this case, by activating uncertainty about the causes of one's judgments via a conditional warning about possible bias) motivates a tentative and careful approach to corrections. Although not examined here, similar correction of target judgments should follow from temporary activation of available, but nonchronic CU beliefs (Weary & Edwards, 1994; 1996).[4]

In the current work, we have proposed that when people chronically high in CU receive a conditional warning, they become motivated to correct their judgments for bias. A possible alternative explanation is that high CU individuals are simply more attuned to social desirability concerns and just moderated their judgments under a conditional warning to present a more positive self-image. However, self-presentational concerns do not seem a plausible alternative explanation for the current results, because CU beliefs are unrelated to social desirability (Weary & Edwards, 1994). Moreover, the positive correlations found between CU and depression, perceived control loss, and neuroticism (e.g., Edwards & Weary, 1998; Edwards, Weary & Reich, 1998; Jacobson, Weary & Edwards, 1999; Weary & Edwards, 1994, 1996; Weary & Jacobson, 1997; Weary, Jacobson, Edwards & Tobin, 2001) suggest that high CU individuals are not unwilling to convey negative impressions of the self.

Before concluding, it would seem important to ask whether our correction findings are specific to causal uncertainty per se, or whether they also might result from activation of other kinds of uncertainty motives. Certainly, individual differences in uncertainty orientation (Sorrentino, Bobocel, Gitta, Olson & Hewitt, 1988) can influence the content and processes of making various social judgments. For example, uncertainty reduction has been shown to motivate systematic processing of highly self-relevant information, whereas certainty-orientation motivates systematic processing of less self-relevant information. Moreover, personal uncertainty (awareness of dissonant self-beliefs) can lead to defensive, compensatory conviction in one’s beliefs and values (McGregor, Zanna, Holmes & Spencer, 2001). However, these and other sorts of uncertainty motivations might not increase cognitive processing about possible biases on one’s judgments. Activated uncertainty probably would need to address the causes of judgments for it to instigate the kind of judgmental corrections we observed here. Future research, however, will need to examine the validity of this argument.

In the future, it also might be useful to examine whether other bias-influenced phenomena are impacted by causal uncertainty. Candidates include persuasion (e.g., Petty, Brinol & Tormala, 2002) affective forecasting (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1997; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000), and the effects of cognitive and affective feelings on judgments (Schwarz & Clore, 1996).

Conclusion

In general, people seem to be naïve realists with regard to their own reactions and judgments (Higgins, 1998), apparently assuming that they are caused by what they seem to be "about." Such causal certainty may, in fact, lead to complacency about possible biases on judgments. The current research suggests that raising causal uncertainty about one's judgments elicits careful, tentative correction for bias. In addition, it appears that at least among people with chronically accessible causal uncertainty beliefs, correction of judgments partly reduces feelings of uncertainty. Causal uncertainty thus increases the motivation to carefully correct current judgments and may enhance the likelihood of future corrections.

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Footnotes

[1] Following Stapel et al. (1998), we attempted to manipulate the salience of the bias. Participants read (subtle bias) or rated (salient bias) the names of tropical vacation spots before receiving a warning or no warning and making their target judgments. Because this manipulation was ineffective and yielded no significant effects, we do not discuss it further.

[2] One participant did not complete the measure of uncertainty feelings.

[3] Some readers might wonder whether the unexpected CU-correction relationship in the no-warning condition might have occurred in the warning condition as well. If in Study 2 low-CU participants generally had shown less of an availability bias than high-CU participants, then the positive CU-correction relationship under a conditional warning would have been contrary to that trend. Moreover, the Study 2 results still would have shown that high-CU individuals took a tentative, careful, but not perfectly calibrated approach to correction. If their approach were perfectly calibrated, the highest-CU participants would not have undercorrected their judgments.

[4] Need for cognition (Cacioppo & Petty, 1982) is negatively associated with causal uncertainty (Weary & Edwards, 1996) and positively associated with correction of judgments (D'Agostino & Fincher-Keifer, 1992; DeSteno, Petty, Wegener & Rucker, 2000; Martin et al., 1990). To see whether any of our causal uncertainty results could be explained by need for cognition, the 18-item short form of the Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984) was included in the "Psychology Department Scaling Study" in Studies 1 and 2. When we added standardized Need for Cognition Scale scores to the regression analyses for target judgments in Studies 1 and 2, the CUS X Warning interactions remained significant. Thus, need for cognition cannot account for our causal uncertainty findings in either study.

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Figure Captions

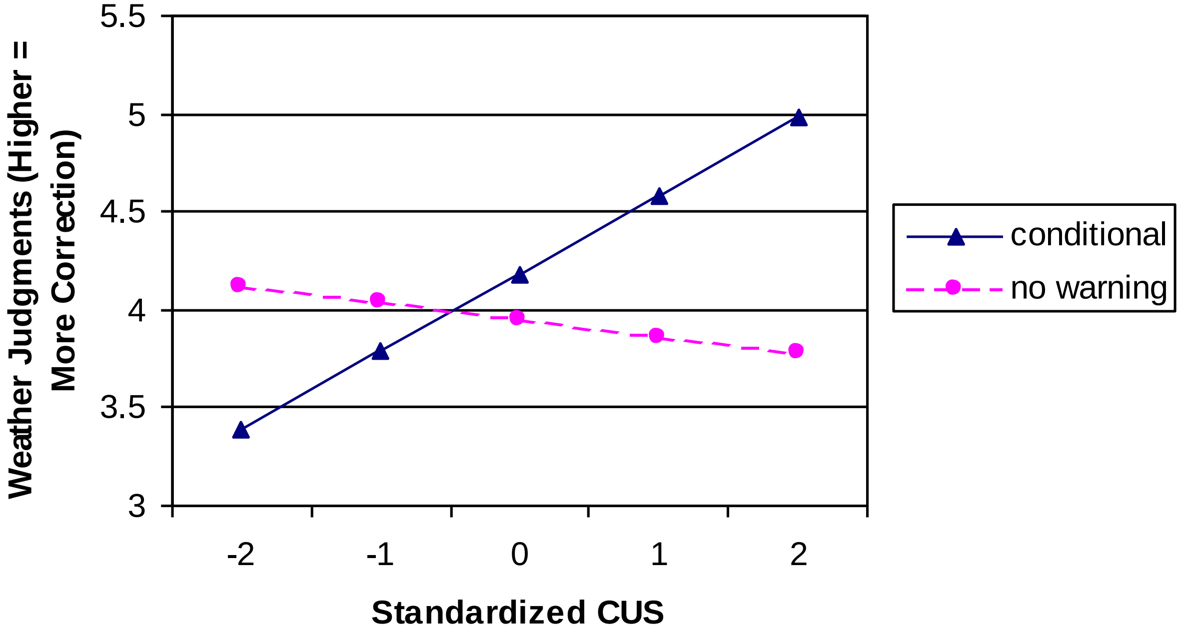
Figure 1. Regression of weather judgments on causal uncertainty scores and warning condition in Study 1.

Figure 2. Regression of word frequency judgments on causal uncertainty scores and warning condition in Study 2.

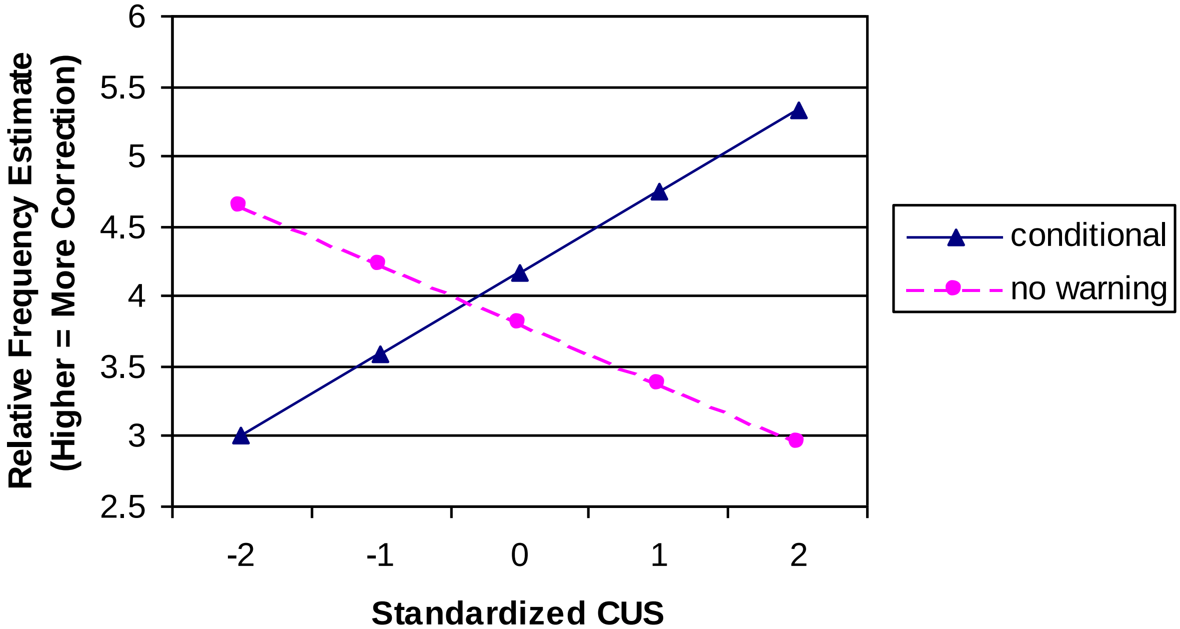
Figure 3. Regression of uncertainty feelings on causal uncertainty scores and warning condition in Study 2.

Figure 4. Path analysis of the relationship between causal uncertainty scores, correction of frequency judgments, and feelings of uncertainty; warning condition in Study 2.

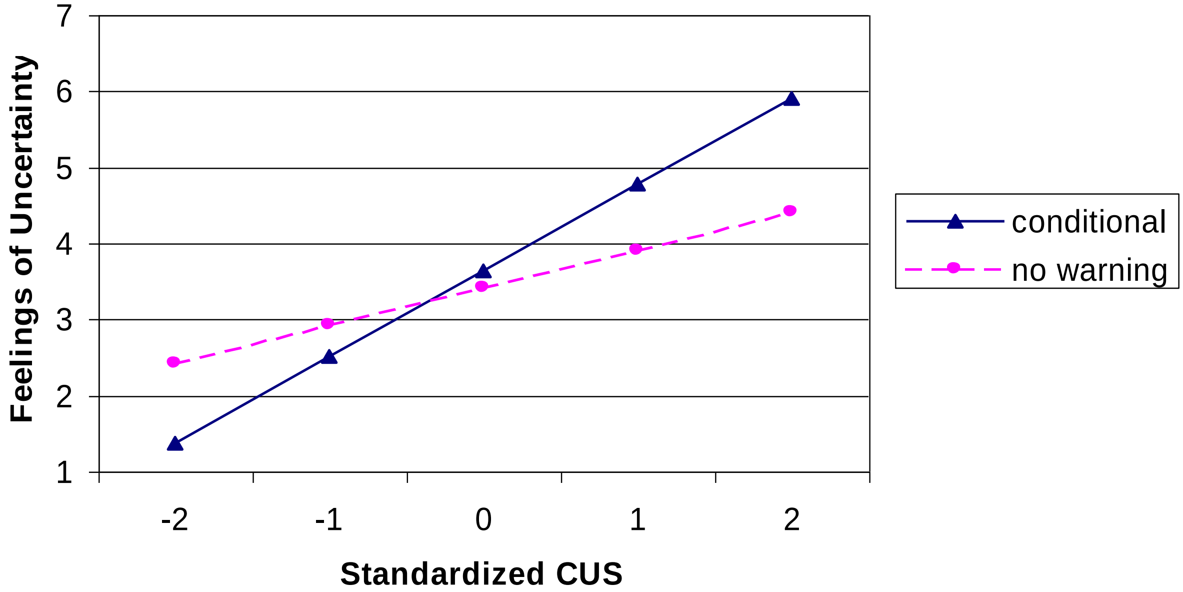
Figure 5. Path analysis of the relationship between causal uncertainty scores, correction of frequency judgments, and feelings of uncertainty; no warning condition in Study 2.



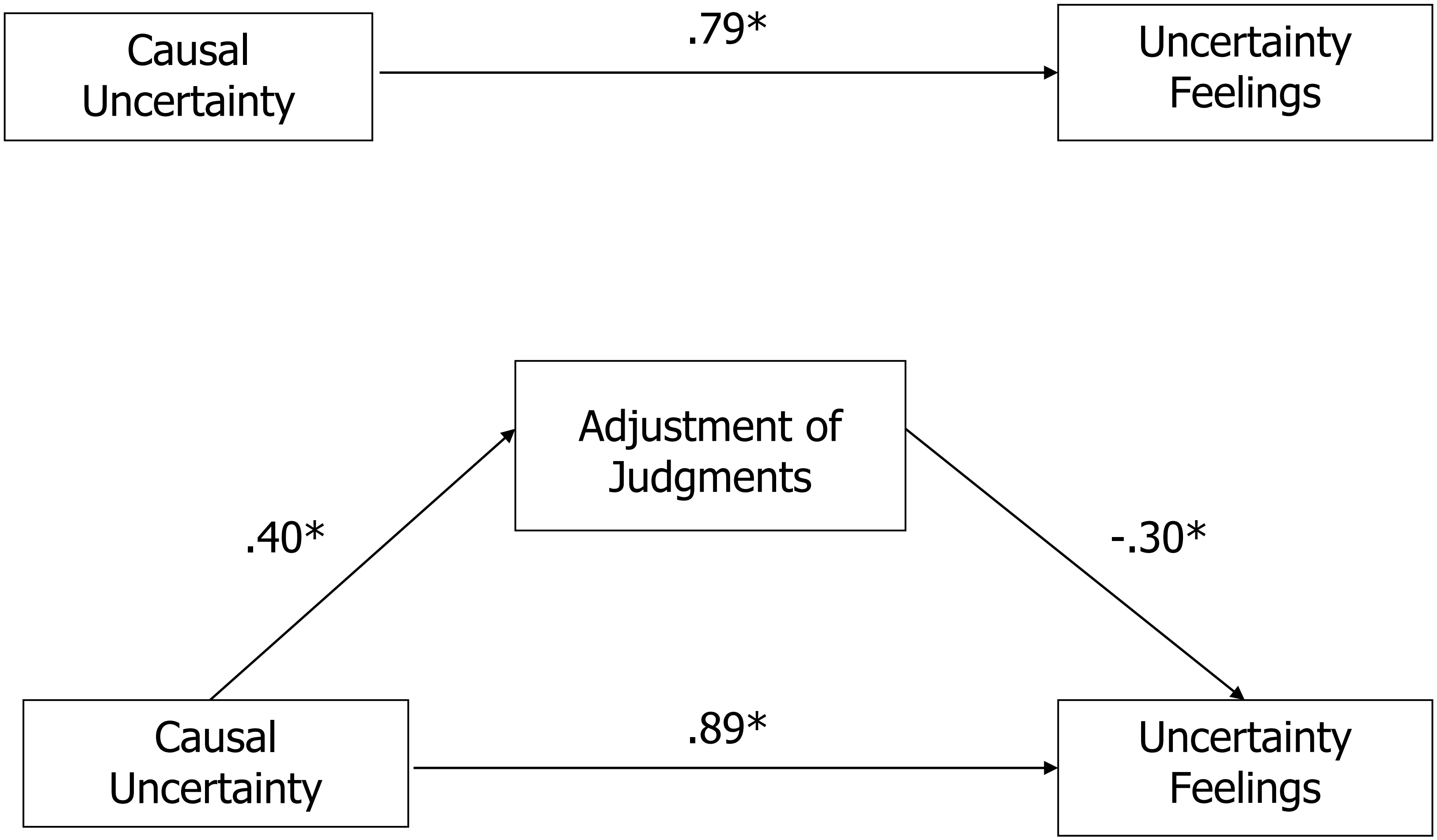
Note. Scale range of weather judgments is from 1 (*not at all desirable*) to 9 (*very desirable*). The mean target rating of participants in the control group, who were not exposed to any of the context stimuli, was 4.86.



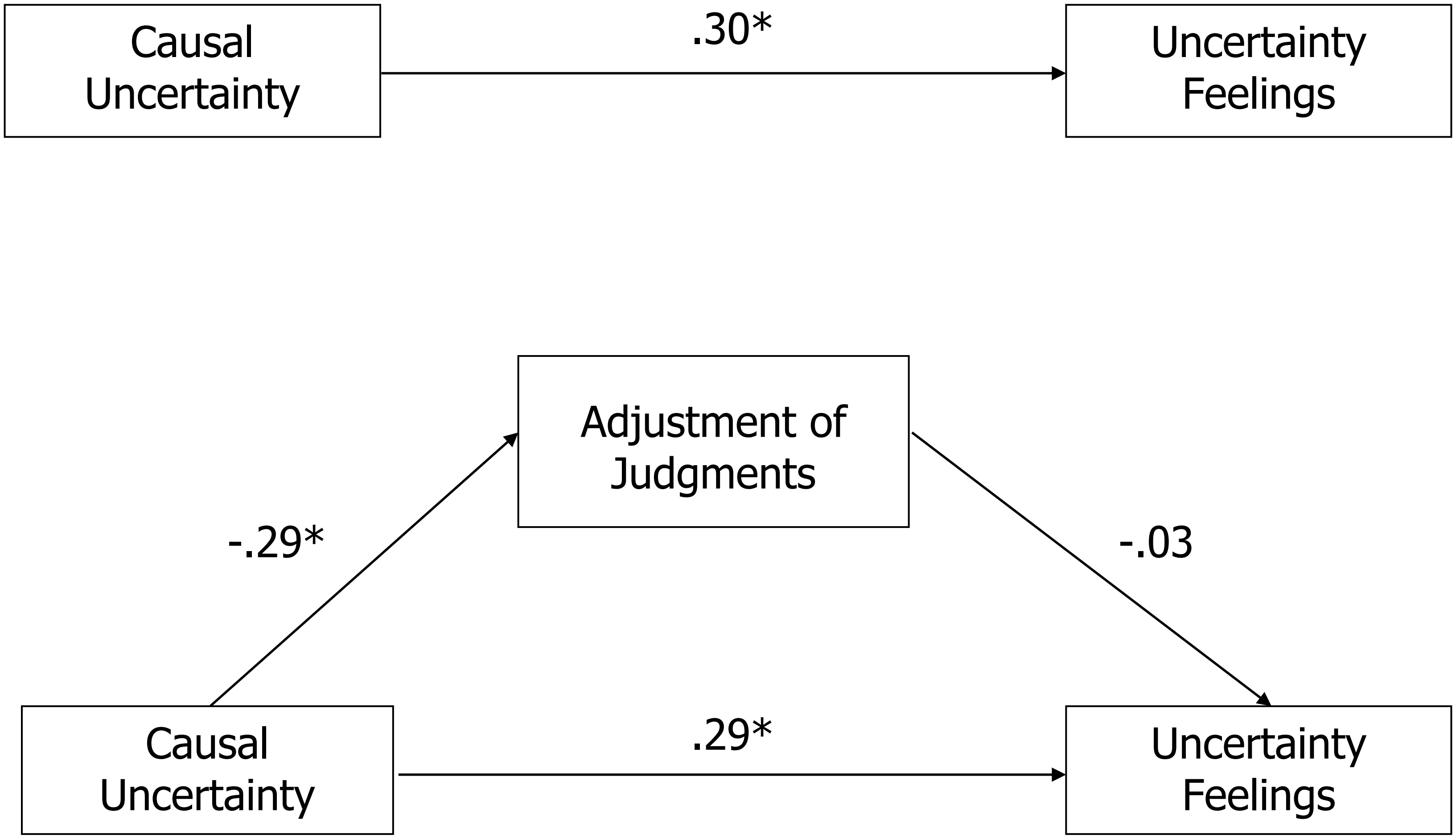
Note. Scale range of the relative frequency estimate is from 1 (*many more r-first words*) to 9 (*many more r-third words*). The mean relative frequency estimate of participants in Study 1b, who were not exposed to any of the context stimuli, was 6.16.



Note. Scale range of uncertainty feelings is from 1 (*not at all uncertain*) to 9 (*extremely uncertain*).


Causal
Uncertainty
.79*
Uncertainty
Feelings
Adjustment of
Judgments
.40*
-.30*
Causal
Uncertainty
.89*
Uncertainty
Feelings

*p < .05.


Causal Uncertainty
.30*
Uncertainty Feelings
Adjustment of Judgments
-.29*
-.03
Causal Uncertainty
.29*
Uncertainty Feelings

*$p < .05$.