Chronic and Temporarily Activated Causal Uncertainty Beliefs and Stereotype Usage

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In 3 studies, we examined the hypothesis that the effects of stereotype usage on target judgments are moderated by causal uncertainty beliefs and related accuracy goal structures. In Study 1, we focused on the role of chronically accessible causal uncertainty beliefs as predictors of a target's level of guilt for an alleged academic misconduct offense. In Study 2, we examined the role of chronic causal uncertainty reduction goals and a manipulated accuracy goal; in Study 3, we investigated the role of primed causal uncertainty beliefs on guilt judgments. In all 3 studies, we found that activation of causal uncertainty beliefs and accuracy concerns was related to a reduced usage of stereotypes. Moreover, this reduction was not associated with participants' levels of perceived control, depression, state affect, need for cognition, or personal need for structure. Results are discussed in terms of their implications for the model of causal uncertainty and, more generally, in terms of the motivational processes underlying stereotype usage.

Within the past decade, there has been an explosion of renewed interest in goals and their effects on cognition, affect, and behavior (Gollwitzer & Bargh, 1996; Higgins & Sorrentino, 1990; Sorrentino & Higgins, 1986, 1996). Although much of this work focused on specific goal contents and their affective and behavioral sequelae, a major interest of contemporary theorists and researchers has been the various cognitive processes involved in goal-directed action. Individuals (e.g., Carver & Scheier, 1990; Weary & Edwards, 1996) working within this more recent tradition generally have viewed goals as cognitive representations of desired end states, and they have focused their attention on the cognitive processes and strategies used in the pursuit of goal attainment and/or disengagement.

In addition to this focus on the cognitive bases of motivation and goal pursuit, several investigators (e.g., Bargh & Gollwitzer, 1994; Spencer, Fein, Wolfe, Fong, & Dunn, 1998) have begun to focus on the possible implicit, or automatic, activation of goal-relevant cognitive structures. These investigators have reasoned that if goals are represented as cognitive structures, then they, just like other cognitive structures (e.g., social roles, stereotypes, schemas, scripts), ought to be capable of automatic activation by environmental stimuli. Consistent with this reasoning, a recent study reported by Chartrand and Bargh (1996) found that temporarily primed impression formation or memorization goals produced the same effects as had explicit manipulations of them.

The present research also focuses on the effects of implicit and explicit goal activation on cognitive processes. Here, however, we focus on the activation of what is thought for some perceivers to be a chronically accessible goal—causal uncertainty reduction (Weary & Edwards, 1996). Moreover, we examine the effects of causal uncertainty resolution within the highly consequential context of stereotype usage. Before describing the current research, however, we will first present an overview of Weary and Edwards's model of causal uncertainty. The model was derived from Weary and colleagues' work on depressed people's social perception processes (for reviews see Weary & Gannon, 1996, and Weary, Marsh, Gleicher, & Edwards, 1993). It also owes an important intellectual debt to more general models of cognitively based motivations, and, in particular, to cybernetic or control theory (Hyland, 1988).

Causality Uncertainty Beliefs and Related Goal Structures

It long has been recognized (Berlyne, 1962; Festinger, 1954; Kagan, 1972) that people are motivated for survival purposes to reduce uncertainty about or to be as accurate as possible in their cognitive understandings of the world. Although several sources of

uncertainty motives have been identified, Weary and Edwards (1994, 1996) have argued that there is perhaps no more fundamental source of such motives than that associated with a failure to understand the relatively unchanging, underlying causal conditions for events. That is, people grasp reality and can predict and control it only by referring transient and variable behavior and events to the relatively unchanging conditions of the world (Heider, 1958). Thus, any uncertainty about one's ability to accurately identify cause and effect relationships can be expected to engender doubt about one's cognitive constructions and comprehensions of reality and, correspondingly, about one's ability to exercise effective control.

The causal uncertainty model builds upon this fundamental need to know and this need to perceive accurately or at least to reduce uncertainty about the causes of events. More specifically, Weary and Edwards (1994, 1996) have argued that there exist chronic individual differences in causal uncertainty beliefs that are related to dispositional motives to reduce uncertainty about the social environment. Certainly, such motives can be domain specific; however, their model focuses on more generalized, chronic causal uncertainty beliefs and reduction motives because these can be expected to exert profound and long-lasting effects on a variety of cognitive processes and overt behaviors.

In their model, Weary and Edwards (1996) differentiated two components of the causal uncertainty construct: causal uncertainty beliefs and causal uncertainty feelings. They defined *causal uncertainty beliefs* "as generalized self-constructs about one's uncertain or inadequate understanding or detection of causal relations in the social world" (Weary & Edwards, 1996, p. 159). Such beliefs presumably are available for all people, because some exposure to events of ambiguous or vague causal determination is universal. However, Weary and Edwards argued that they are more global and chronically accessible (i.e., persistently high in their activation potential) for some people.

In particular, Weary and Edwards (1996) contended that people who possess generalized expectations of response–outcome noncontingency are more likely to perceive situations as uncontrollable. Because this assimilative influence of perceivers' generalized expectancies on the perceptions of often ambiguously caused social events is thought to occur at an automatic level, perceivers will have no ready explanation for the perceived noncontingency and will, as a result, experience doubt about their understanding or detection of causal forces. Over time, this frequent activation should lead to more global and chronically accessible causal uncertainty beliefs (Edwards & Weary, 1998; Jacobson, Weary, & Edwards, 1999).

Chronic accessibility, however, is not the only factor that determines the likelihood of belief activation. Situational perceptions and expectations of uncontrollability, task instructions to form an impression of another person or to focus on the causes of one's own or another's outcomes, or information relevant to causal inference processes (e.g., evidence of multiple sufficient causes) also may momentarily activate chronically accessible and, if sufficiently elaborate, salient, or detailed, even nonchronic causal uncertainty beliefs.[1]

Once activated, such beliefs give rise to metacognitive feelings that are experienced as surprise, bewilderment, or confusion (Clore, 1992; Weary et al., 1993). These feelings, in turn, alert perceivers to the unsatisfactory nature of their current states of causal knowledge. They also automatically activate both a representation of a desired state of knowledge and strategies to achieve that end state. In this case, the desired state is a subjective sense of accurate causal understanding (Swann, 1984); the accuracy-motivated strategies generally are thought to entail an effortful, deliberative, intentional search for and processing of the available diagnostic social information (Edwards, 1998; Weary & Jacobson, 1997). Finally, it is important to note that Weary and Edwards also suggest that this accuracy goal and its accompanying cognitive strategies can be activated consciously or they may become active relatively automatically after frequent activation or pairings with situational cues.

Causal Uncertainty Beliefs and Stereotype Usage

Perhaps the dominant view of stereotypes is that they are a set of descriptive beliefs that generally are thought to be characteristic of members of some social category. When a target is categorized as belonging to a given group, these beliefs are activated. Moreover, when the available and applicable target information is ambiguous, when the information-processing objective is complex, when perceivers have a need to simplify the available information, and/or when perceivers are unmotivated to engage in careful processing, such stereotypic beliefs may influence perceivers' impressions of and reactions to the target (Bodenhausen, Kramer, & Susser, 1994; Bodenhausen & Lichtenstein, 1987; Bodenhausen & Wyer, 1985; Macrae, Hewstone, & Griffiths, 1993; Macrae, Milne, & Bodenhausen, 1994; Van Knippenberg, Dijksterhuis, & Vermeulen, 1999).

This social–cognitive perspective and associated research on stereotyping, then, have endorsed a cognitive miser portrait of stereotypers, suggesting that they "categorize because it requires too much mental effort to individuate" (Fiske, 1989, p. 253). Given this portrait, it is not surprising that researchers recently have begun to examine the effect that individual differences in the expenditure of cognitive effort have in stereotyping (Bodenhausen & Lichtenstein, 1987; Crawford & Skowronski, 1998; Neuberg & Newsom, 1993; Schaller, Boyd, Yohannes, & O'Brien, 1995).

What role might causal uncertainty play in the use of stereotypes? The causal uncertainty model suggests that those individuals whose causal uncertainty beliefs are likely to be activated should, in general, be more motivated to understand the social world and to form accurate impressions.[2] As a result, they should be more likely to process social information in a thoughtful and systematic, rather than a heuristic, fashion. They should attend to and attempt to integrate into their impressions and judgments all information that they perceive to be diagnostic (Fiske & Neuberg,

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[1] Although the causal uncertainty construct may appear superficially to bear some resemblance to the concept of uncertainty orientation (Sorrentino & Short, 1986), the two theoretically are thought to be and, in fact, empirically have been shown to be unrelated, $r = .07$ (Walker & Sorrentino, 2000). Interested readers should see Weary and Edwards (1996) for a complete treatment of this issue.

[2] We make no claims here about the actual accuracy or inaccuracy of stereotypes. Our use of the term *accuracy* refers to a subjective accuracy goal of perceivers (Swann, 1984). We do, however, hold that stereotypes are consensually shared beliefs, and we establish this characteristic of the particular stereotype used in the current research for our sample.

1990). To the degree that the available information is ambiguous (i.e., contains cues both consistent and inconsistent with the default hypothesis), the influence of available stereotypes on target judgments, then, should be lessened for those perceivers who possess temporarily or chronically accessible causal uncertainty beliefs.

This hypothesis was investigated in three different studies, all of which examined stereotype usage in a situation analogous to a criminal justice setting. In the first study, we examined the use of stereotypes by participants whose chronically accessible causal uncertainty beliefs should have been activated by task instructions. In Study 2, we examined the roles of both implicit chronic and an explicit temporary manipulation of uncertainty resolution (i.e., accuracy) goals on stereotype usage. In Study 3, we investigated a key notion of the causal uncertainty model—namely, that activation of available, but nonchronic, as well as chronic causal uncertainty beliefs should result in similar motivated information-processing strategies. Specifically, in this study, we examined the effects of both chronic and primed causal uncertainty beliefs on participants' use of available stereotype information. Finally, in an attempt to rule out alternative explanations for any obtained findings, all studies included assessments of individual difference variables known to be related to causal uncertainty (Weary & Edwards, 1994, 1996).

Study 1

The general procedure for all three studies followed closely that of Bodenhausen and his colleagues (e.g., Bodenhausen et al., 1994, Experiment 4). Briefly, as part of a study of legal socialization, participants were asked to read a disciplinary case that was adjudicated at another university and to make decisions about the defendant's guilt. The case involved an allegation of cheating on an exam and presented ambiguous evidence. For half of the participants, the accused student was identified as a member of a group stereotypically associated with the alleged offense (stereotype information condition); for the remainder of the participants, the student was not so identified (no-stereotype condition). After reading the case, all participants were asked to report on the likelihood of the student's guilt.

Past work using this paradigm has shown that the experimental context and instructions are not so motivating that all perceivers engage in careful processing of the case information and avoid use of the stereotype. We expected, then, that participants low in causal uncertainty would see the stereotyped compared to the nonstereotyped target as more guilty. However, because individuals who possess chronic and global causal uncertainty beliefs should be more likely to have their beliefs activated by the task instructions (i.e., to assume the role of disciplinary decision maker in the adjudication of the misconduct case), they also should be more likely to have associated accuracy goals activated. Past research has shown that temporary increases in accuracy motivation are associated with reduced stereotyping (e.g., Stangor & Ford, 1992). Accordingly, we expected that participants who were high in causal uncertainty would show no differences in their target judgments as a function of the presence or absence of the stereotype information.

Method

Participants

In partial fulfillment of their course requirements, 174 introductory psychology students (96 women, 77 men, and 1 person who failed to report gender) participated in this study. Random assignment by sequential blocks was used to assign participants to one of the two stereotype information conditions. Three participants were excluded because they correctly guessed the purpose of the experiment. Consequently, the final analyses were conducted using the remaining 171 participants (94 women, 76 men, and 1 unspecified).

Instruments

Causal Uncertainty Scale. The Causal Uncertainty Scale (CUS; Weary & Edwards, 1994) measures chronic individual differences in causal uncertainty beliefs. Participants' responses to the 14 statements that comprise the scale can range from *strongly disagree* (1) to *strongly agree* (6), and the responses are summed to provide a total score; higher numbers indicate greater causal uncertainty. Sample items from the scale include: "When I receive poor grades, I usually do not understand why I did so poorly"; "When I see something good happen to others, I often do not know why it happened"; and "I often feel like I do not have enough information to come to a conclusion about why things happen to me." The scale has been shown to have high internal consistency (Cronbach's α = .83) and a 6-week test–retest reliability from .62 to .80 (see Edwards, Weary, & Reich, 1998, and Weary & Edwards, 1994, for reviews of the psychometric and construct validation evidence for this scale).

The mean CUS score in the current study was 38.87 (SD = 10.28). To determine whether participants in the two stereotype conditions differed in terms of their level of causal uncertainty, their CUS scores were regressed on the stereotype information condition variable (effects coded so that the stereotype condition = 1 and the no-stereotype condition = -1). This analysis revealed no CUS differences as a function of stereotype condition, β = .06, $t(169)$ = 0.83, p = .41.

Differential Emotions Scale. An adaptation (Cacioppo, Martzke, Petty, & Tassinary, 1988) of the Differential Emotions Scale (DES) was used to measure positive and negative state affect. Participants' responses to the eight sets of affect words that comprise the scale can range from 1 (*not at all*) to 7 (*very strongly*). After the two positive items are reverse scored, the responses are summed to provide a total score; higher numbers indicate greater negative affect. Sample items include "warmhearted/joyful/elated," "sad/downhearted/blue," and "irritated/angry/mad." The mean DES score in the current study was 21.71 (SD = 7.03). In addition, a regression analysis indicated that participants in the stereotype condition compared to those in the no-stereotype condition reported slightly more negative affect, β = .14, $t(169)$ = 1.83, p = .07.

Need for Cognition Scale. The short form of the Need for Cognition Scale (NCS; Cacioppo, Petty, & Kao, 1984) was used in the current experiment to assess individual differences in people's tendency to engage in and enjoy effortful cognitive activity. Participants' responses to the 18 statements that the scale comprises can range from *extremely uncharacteristic* (1) to *extremely characteristic* (5). After nine items are reverse scored, the responses are summed to yield a total score; higher numbers indicate a greater need for cognition (see Cacioppo, Petty, Feinstein, & Jarvis, 1996, for a review of the psychometric and construct validation evidence for this scale). The mean NCS score for the current study was 59.96 (SD = 11.93). There were no NCS differences as a function of stereotype condition, β = .04, $t(169)$ = 0.57, p = .57.

Personal Need for Structure Scale. The Personal Need for Structure Scale (PNS; M. M. Thompson, Naccarato, & Parker, 1992) measures chronic individual differences in the desire for simple structure. The response options for each item range from *strongly disagree* (1) to *strongly agree* (6). Participants' responses were summed across the 11 items (after
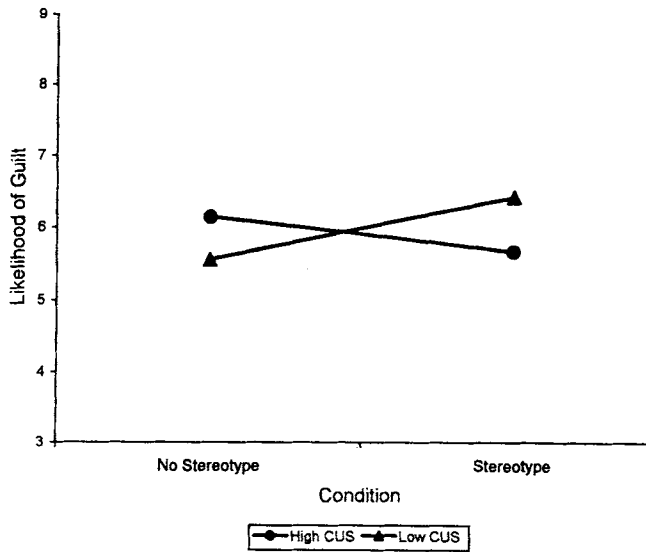
Figure 1. Study 1: The regression of target guilt ratings on Causal Uncertainty Scale (CUS) scores and stereotype information condition.

three responses were reverse scored) to provide a total score; higher numbers indicated a greater need for simple structure (see Neuberg & Newsom, 1993, for a review of the psychometric and construct validation evidence for this scale). The PNS mean in the current sample was 39.22 (SD = 7.82). Additionally, a regression analysis revealed no PNS differences as a function of stereotype condition, β = −.10, $t(169)$ = −1.24, p = .22.

Procedure

The current experiment was conducted on computers, and groups of 4 participants were run simultaneously, albeit in individual cubicles. After participants were seated, the experimenter told them that they should follow the instructions on the computer screen. When they finished answering some demographic questions (e.g., age and gender), participants were given the initial instructions that explained that the study was an investigation of legal socialization that was focused specifically on students as disciplinary decision makers.

Next, participants were provided with additional instructions that explained that they would be reading a case in which a student from another university had been accused of a wrongdoing. They were told that they would be asked to answer some questions about this case. They then read a one-paragraph summary of a case in which a student was accused by his professor of cheating on a math exam. In the stereotype condition, participants were informed that the student was an athlete (specifically, a track-and-field star); in the no-stereotype condition, this information was excluded. Except for this piece of information, the case summaries were identical. A pilot study demonstrated that high and low causal uncertainty students equally viewed student athletes as more likely to cheat on a test than members of various other collegiate and ethnic groups (e.g., fraternity member, student government member, Hispanic American male). Student athletes also were rated by both high and low causal uncertainty students as being significantly more likely to cheat on a test than to commit nearly any other infraction (e.g., physically attacking a roommate, selling drugs, stealing CDs).

The participants next answered a series of questions, presented in random order, about the case and their perceptions of the accused student. The primary dependent measure, an 11-point rating scale of the likelihood that the student was guilty of cheating on the math exam, was embedded among

these questions. Higher ratings on this scale indicated a greater likelihood of guilt. After responding to the questions, all participants provided a separate, open-ended response regarding their perceptions of the study's purpose. Next, they completed a rating scale that was designed to tap their processing goal. Finally, they were presented with the series of randomly ordered scales (i.e., CUS, NCS, PNS, and DES). After the participants had completed the scales, they were given a written debriefing and an opportunity to ask any questions.

Results

Measure of Perceived Guilt

To test whether causal uncertainty moderated the influence of stereotype information on guilt judgments, we conducted a simultaneous multiple regression analysis. In this analysis, the participants' guilt likelihood ratings were regressed onto their standardized continuous CUS scores, the effects-coded stereotype condition variable, and the product of the standardized and the coded variable that represented the two-way interaction. As recommended by Aiken and West (1991), the continuous variable was standardized prior to the analysis for two purposes. First, similar to centering the continuous measure, this additive transformation reduces the multicollinearity between the main effect and its product term, the interaction. Second, unlike centering, this transformation results in the appropriate standardized solution for the interaction term and the simple slopes associated with the interaction when one uses the regression coefficient from the unstandardized solution (Friedrich, 1982). The coded variable was, of course, not transformed.

As predicted, the Causal Uncertainty × Stereotype Information interaction was significant, β = −.33, $t(167)$ = −2.63, p = .009. To examine this interaction further, we evaluated the effect of the stereotype manipulation on guilt ratings at three levels of causal uncertainty: high (1 SD above the standardized CUS score mean = 1), moderate (at the standardized CUS score mean = 0), and low (1 SD below the standardized CUS score mean = −1). These simple slopes tests are consistent with the simple effect comparisons reported in previous research using this paradigm, and they control for any baseline differences that might be associated with levels of causal uncertainty.

At high and moderate levels of causal uncertainty, participants who read that the accused individual was an athlete did not differ in their ratings of the student's guilt from those who did not receive this category membership information, β = −.15, $t(167)$ = −1.34, p = .18, and β = 0.06, $t(167)$ = 0.74, p = .46, respectively. At low levels of causal uncertainty, however, participants who received, compared to those who did not receive, the stereotype information rated the student as more likely to be guilty, β = 0.26, $t(167)$ = 2.40, p < .02 (see Figure 1). [3]

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[3] As a check that both high and low causal uncertainty participants were encoding the category membership detail, we asked participants at the end of the study to recall as many details of the case summary as possible. Chi-square analyses of the number of participants who spontaneously mentioned that the defendant was a track star were similar across causal uncertainty levels, $\chi^2(1, N = 84)$ = .23, p = .23. Additionally, the number of stereotype information condition participants who mentioned the category information (60%) tended to be greater than chance, $\chi^2(1, N = 84)$ = 3.25, p = .07. This number likely would have been even greater had we focused recall on the defendant's characteristics.

Secondary Analyses

We included measures of three individual differences—need for cognition, personal need for structure, and negative mood—that could have led participants to process the case information more systematically and, as a result, to avoid an undue influence of the stereotype information. These individual differences could provide an alternative explanation for our causal uncertainty results, or they potentially could moderate the obtained causal uncertainty findings. Previous research (Edwards et al., 1998; Weary & Edwards, 1994) has found that the CUS is negatively correlated with need for cognition ($n = 105, r = -.42, p < .001$) and is positively correlated with negative affect ($n = 71, r = .28, p < .02$) and personal need for structure ($n = 71, r = .25, p < .05$). Comparable correlations of the CUS with these other scales were obtained (NCS, $r = -.28, p < .001$; DES, $r = .35, p < .001$; PNS, $r = .13$, $p = .08$).

Three separate simultaneous regression analyses were conducted. In these analyses, the guilt likelihood ratings were regressed on the standardized continuous CUS scores, the effects-coded stereotype information condition variable, and standardized continuous scores from one of the three other measures. In addition, each model included all of the two- and the three-way interactions. In all three analyses, the only significant predictor of guilt likelihood ratings was the Causal Uncertainty × Stereotype Information interaction (βs ranged from $-.40$ to $-.30$, ts[163] = -2.20 to -2.84, ps = .03 to .005). None of the other predictors were significant (ps > .18). Finally, when CUS scores were not included in the regression equation, none of the two-way interactions of stereotype and NCS, DES, or PNS scores was significant (for NCS, DES, PNS, βs = .19, $-.06$, $-.14$, and ps = .12, .65, .27, respectively).

Motivation to Process

Although past research (e.g., Pelham & Neter, 1995) has found that perceivers' self-reports of their motivation to process social information often are inconsistent and unreliable, in Study 1, we included a question used by Bodenhausen et al. (1994) to tap participants' desires to form an accurate impression of the target's guilt. Because participants had been told in our study that we were interested in students as disciplinary decision makers and that they would be asked questions about the case summary, we asked them to indicate on an 11-point scale the degree to which they felt accountable for their judgments. We did not expect the mere presence of target-category information to arouse greater levels of accuracy motivation (although it might well result in greater activation of other types of motivations—namely self-presentational or social desirability concerns—a point to which we will return in the General Discussion). Instead, we expected only a main effect of causal uncertainty beliefs on this measure. A regression analysis including standardized CUS scores, the stereotype information condition variable, and the interaction term revealed a main effect of causal uncertainty, $\beta = .33, t(167) = 2.10, p < .04$. Participants with chronic, global causal uncertainty beliefs felt more accountable than did those without such beliefs, regardless of the presence or absence of the category label.

Discussion

The results obtained for Study 1 were consistent with the notion that individuals for whom accuracy concerns were likely to be active would process the available social information in a thoughtful and systematic, rather than a heuristic, fashion. That is, the judgments of the target's guilt made by participants who possessed more chronically accessible causal uncertainty beliefs showed no influence of the available stereotype information. However, the judgments made by participants who did not possess such beliefs showed the expected use of the stereotype; they judged the target as more guilty in the stereotype compared to the no-stereotype condition.

The obtained interaction of causal uncertainty beliefs and stereotype availability was not accounted for nor was it moderated by three correlates of causal uncertainty—need for cognition, state affect, or the personal need for structure. In fact, even when participants' causal uncertainty levels were not controlled, the interactions of these correlates with stereotype information availability were not observed. Although past research using the same procedure that was used in Study 1 has demonstrated similar weak or nonexistent effects of need for cognition (Bodenhausen & Lichtenstein, 1987; Schaller et al., 1995), moderator effects for each of the other variables have been found under certain conditions.[4] Consequently, some discussion of their current null effects would seem to be warranted.

First, although Bodenhausen et al. (1994) in several studies have found that target guilt ratings made by happy compared to neutral mood people generally are more likely to be influenced by available stereotype information, it is important to note that this earlier research entailed a manipulation of mood state. In Study 1, we simply assessed the natural levels of state affect experienced by our participants. Consequently, it seems likely that the levels of positive affect and, as a result, the stereotype usage of the current research participants may well have been less pronounced than in the Bodenhausen et al. study.

Second, only one study has examined the use of stereotypes by individuals high and low in the personal need for structure. That study used a very different paradigm from the one used in Study 1. More specifically, Neuberg and Newsom (1993) examined the moderating effects of perceivers' personal needs for structure on (gender) stereotype usage by asking participants to make trait ratings for male and female target persons who were behaving ambiguously. They found that participants who were high in the personal need for structure made more stereotypic trait ratings of the targets. It is important to note, however, that initial stereotype

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[4] Neuberg and Newsom (1993) noted that their finding of greater stereotyping on the part of high PNS participants was due solely to the PNS Factor 1 (Desire for Simple Structure). When we analyzed our participants' guilt ratings and included their scores on the PNS Factor 1, Factor 2 (Response to Lack of Structure), or both Factors 1 and 2 with the stereotype information variable and their interaction(s) in a regression equation, we still found no effects involving either of the PNS factors (βs ranged from $-.16$ to .16, and ps ranged from .27 to .93). Also, when the PNS factors were included with CUS scores in the regression, the Causal Uncertainty × Stereotype Information interaction remained significant (βs = $-.34$ and $-.33$, ps = .01 and < .02, for analyses including Factors 1 and 2, respectively).

formation effects found for individuals who are high in the personal need for structure have been shown to be related more to categorization than to attributional processes (Schaller et al., 1995). Because the guilt ratings used in the current research clearly required both categorization and attributional reasoning (Bodenhausen & Lichtenstein, 1987; Bodenhausen & Wyer, 1985), it may not be surprising that no stereotype effects associated with the PNS construct were obtained in the present research.

Study 2

The results of Study 1 supported our arguments that differences in globality and chronicity of causal uncertainty beliefs and, presumably, related differences in the chronic accessibility of accuracy goals would be associated with differences in the use of stereotypes. Still, important converging evidence for these arguments could be provided by a demonstration that a similar moderation of stereotype usage by low causal uncertainty participants results from a direct manipulation of their levels of accuracy motivation. Accordingly, Study 2 used such a manipulation, in addition to an assessment of participants' chronic levels of causal uncertainty.

A second purpose of Study 2 was to assess the effects of goal importance on stereotype usage. Although the causal uncertainty model (Weary & Edwards, 1996) predicts that those individuals who possess chronically accessible causal uncertainty beliefs should in general also be more likely to view the goal of accurate causal understanding as important, it seems possible that these two variables could be disentangled, at least conceptually (cf. Markus, 1977). That is, it is conceivable that one could be low in causal uncertainty (i.e., certain of their causal analysis skills) and view the possession of an accurate understanding of causal relations as a desirable goal. Alternatively, one could possess chronically accessible causal uncertainty beliefs but still not feel that the possession of an accurate understanding of the world is generally all that important. Such an individual might, for example, believe that events happen because of fate and that no amount of causal understanding will alter future events.

It seems reasonable to expect that, if general causal understanding is more important for some perceivers, the discrepancy between current and desired states of causal knowledge should be more salient and the motivational effects should be magnified. Indeed, this is a general prediction made by cybernetic control theories (Hyland, 1988), and it is a specific prediction made by the causal uncertainty model. Moreover, it should hold regardless of perceivers' chronic levels of uncertainty. The general importance of an uncertainty resolution goal, then, like the temporary manipulation of the accuracy goal used in Study 2, should moderate the motivational effects of causal uncertainty beliefs on stereotype usage.

In Study 2, we used the same basic procedure and materials as we used in Study 1. There were, however, two notable alterations. In addition to the stereotype manipulation, half of the participants received instructions designed to activate a goal of accurate understanding; the other half did not. Additionally, we assessed participants' levels of causal uncertainty and their beliefs in the general importance of causal understanding for their daily lives.

We predicted a four-way interaction of causal uncertainty, stereotype information, chronic goal importance, and manipulated

accuracy goal. Within the no-accuracy goal conditions we expected to replicate the Causal Uncertainty × Stereotype Information interaction obtained in Study 1 at low, but not high, levels of goal importance. Within the accuracy goal instruction conditions, we expected all participants to be highly motivated to process the available information in a careful and systematic fashion. Thus, we did not expect to see the influence of stereotypes on guilt ratings, regardless of participants' levels of causal uncertainty or goal importance.

Finally, we included measures of two additional individual differences that have been shown to be associated with causal uncertainty (Weary & Edwards, 1994, 1996) and which potentially could lead participants to process the case information more systematically. Specifically, we examined the relative power of causal uncertainty, depressive symptomatology, and a sense of personal control over life events as moderators of stereotype usage.

Method

Participants

In partial fulfillment of their course requirements, 217 introductory psychology students (139 women, 78 men) participated in this study. Random assignment by sequential blocks was used to assign participants to one of two stereotype conditions and one of two goal conditions. Because they correctly guessed that the true purpose of the experiment was to investigate stereotyping, 2 female participants were excluded. Consequently, the final analyses were conducted using the remaining 215 participants (137 women, 78 men).

Instruments

CUS. The mean CUS score for this sample was 35.92 (SD = 10.39). To determine if there were any CUS score differences associated with the manipulated variables, participants' CUS scores were regressed on an effects-coded goal condition variable (accuracy goal = 1; no goal = -1), an effects-coded stereotype condition variable (stereotype = 1; no stereotype = -1), and their interaction. No significant effects were obtained ($ps > .16$).

Importance of causal understanding. We included an additional item among several at the end of the CUS to assess the importance of causal understanding. This item asked participants to indicate on a 6-point rating scale the degree to which they disagreed or agreed with the following statement: "Understanding what causes different events in my life is not crucial for my success and happiness." After participants' responses to this item were reverse scored, the mean importance rating was 2.68 (SD = 1.51). Participants' ratings of goal importance were, as expected, related to their CUS scores ($r = .21, p = .002$), but they were unrelated to the two manipulated variables and their interaction ($ps > .30$).

Beck Depression Inventory. The Beck Depression Inventory (BDI; Beck, 1967) consists of 21 items that are scored on a scale from 0 to 3 and are summed to provide a total score for the severity of depressive symptomatology. Although the BDI has been shown to be a well-validated measure of the depth of depressive symptomatology and to be an effective self-report measure of severity of depression (see Beck, Steer, & Garbin, 1988, for a review of psychometric evidence), it is not a sufficient indicator of nosologic depression (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Thus, scores on this measure and our use of the terms *depressed, depressive,* and *depression* are not meant to imply the presence of clinical diagnoses of depression. In the current study, the mean BDI score was 6.67 (SD = 6.60). In addition, participants' BDI scores were marginally lower in the accuracy compared to no-goal condition, $\beta = -.13, t(211) = -1.91$,

$p < .06$. There were no significant effects of stereotype information or of the Goal × Stereotype Information interaction on BDI scores ($ps > .40$).

Sense of Control Scale. A modification of Mirowsky and Ross's (1991) Sense of Control Scale (SCS) was used to assess participants' perceptions of lack of control. We altered the response format for the scale from the original four response options ($-2 = $ *strongly disagree* to $2 = $ *strongly agree*) to the $1 = $ *strongly disagree* to $6 = $ *strongly agree* response format of the CUS. After four of the items were reverse scored, participants' ratings on the eight items were summed; higher scores indicated greater perceived uncontrollability (for evidence regarding the scale's psychometric properties and construct validity, see Edwards, Jacobson, & Weary, 1995; Jacobson et al., 1999; Mirowsky, 1995; Ross & Mirowsky, 1992). The SCS mean for the current sample was 19.23 ($SD = $ 5.27). Additionally, there were no significant SCS score differences as a function of goal or stereotype information conditions ($ps > .24$).

Procedure

The procedure used in Study 2 was identical to that used in Study 1, with one exception. Immediately prior to reading the case summary, participants in the accuracy goal conditions were given instructions designed to activate accuracy concerns. These instructions were adapted from E. P. Thompson, Roman, Moskowitz, Chaiken, and Bargh (1994) and from Bodenhausen et al. (1994). They were as follows:

> We also are concerned with people's accuracy in assessing these cases. That is, we are interested in the thoroughness of the way you go about making your decision or judgments about guilt and innocence as well as the appropriate punishments for different types of misbehavior. In this experiment, you will be asked to read about a case in which a student has been accused of some offense. The case was selected from another university, so it will in all likelihood be unfamiliar to you. After reading the brief case summary, simply answer the questions provided. Bear in mind that you will be held accountable for your judgment, just as if you were a judge on a real peer discipline panel. That is, you will have to be able to explain and justify the decisions that you make about the case you read.

After reading and answering questions about the case and the accused student, all participants completed the CUS and SCS in random order and then completed the BDI.

Results

Measure of Perceived Guilt

A regression analysis was used to examine whether causal uncertainty, the importance of causal understanding, and the goal manipulation interacted to moderate the influence of stereotype information on participants' guilt judgments. The model consisted of standardized continuous CUS scores and importance ratings, effects-coded stereotype information and goal conditions, plus all of the interactions as predictors of guilt likelihood ratings. As in Study 1, the Causal Uncertainty × Stereotype Information interaction was significant, $\beta = -.34$, $t(199) = -2.32$, $p = .02$. Three of the three-way interactions also were significant: Causal Uncertainty × Stereotype Information × Goal, $\beta = .31$, $t(199) = 2.11$, $p = .04$; Causal Uncertainty × Goal × Importance, $\beta = .28$, $t(199) = 1.96$, $p = .05$; and Causal Uncertainty × Stereotype Information × Importance, $\beta = -.30$, $t(199) = -2.11$, $p = .04$. These effects, however, were qualified by the predicted Causal Uncertainty × Stereotype Information × Goal × Importance interaction, $\beta = .36$, $t(199) = 2.53$, $p = .01$.

To simplify interpretation of the four-way interaction, we conducted tests of the simple slopes of the stereotype condition lines for three levels of causal uncertainty (high, moderate, and low) for each combination of goal (accuracy or no goal) by importance (high, moderate, or low). The regression weights for all 18 lines are presented in Table 1.

In the accuracy goal conditions, there was no evidence of stereotyping (all $ps > .33$). That is, regardless of the level of importance, the guilt ratings of high, moderate, and low causal uncertainty participants who received the stereotype information did not differ from those who did not receive this information.

In the no-goal condition, there also was no stereotype effect at high importance levels ($ps > .20$) or for moderate causal uncertainty participants who rated the importance of causal understanding as moderate or low ($ps > .18$). However, low causal uncertainty participants in the stereotype compared to those in the no-stereotype information condition rated the student as more likely to be guilty when they also perceived the importance of causal understanding to be low, $\beta = 1.64$, $t(199) = 3.29$, $p = .001$, or moderate, $\beta = .65$, $t(199) = 2.20$, $p < .03$. In contrast, at low to moderate levels of importance, the high causal uncertainty participants in the stereotype compared to the no-stereotype information condition rated the student as less likely to be guilty at low importance, $\beta = -.96$, $t(199) = -2.38$, $p = .02$, and at moderate importance levels, $\beta = -.64$, $t(199) = -2.21$, $p = .03$. Although not predicted, these latter findings may be suggestive of overcorrection for the stereotype information by high causal uncertainty participants who do not feel that causal understanding is, in general, that important to them.

Secondary Analyses

Both BDI and SCS scores were significantly correlated with the CUS scores ($rs = .28$ and $.46$, respectively, $ps < .01$). To rule out participants' levels of depression or a lack of personal control as potential explanations for the causal uncertainty results obtained in Study 2, we conducted two additional regression analyses. These

Table 1

Effects of Causal Uncertainty, Processing Goal, and Goal Importance on the Use of Stereotype Information in Guilt Likelihood Judgments (Regression Coefficients)

Goal and importance	Level of causal uncertainty		
	Low	Moderate	High
Accuracy goal			
Low importance	-.23	-.21	-.17
Moderate importance	-.15	-.18	-.21
High importance	-.07	-.15	-.24
No goal			
Low importance	1.64**	.34	-.96*
Moderate importance	.65*	.00	-.64*
High importance	-.33	-.34	-.35

Note. Significant positive coefficients are evidence of stereotyping (i.e., higher guilt ratings in the stereotype condition compared to the no-stereotype condition), nonsignificant coefficients are indicative of no stereotyping, and significant negative coefficients may be evidence of overcorrection for the stereotype information.
*$p < .05$. **$p < .01$.

equations consisted of standardized continuous CUS scores and importance of causal understanding ratings, effects-coded stereotype and goal condition variables, and standardized continuous scores from one of the two other measures. In addition, each model included all of the interactions. There were no significant effects involving either SCS or BDI ($ps > .08$); in these analyses, the Causal Uncertainty × Stereotype Information × Goal × Importance interaction remained at least marginally significant (for BDI and SCS analyses, interaction $\beta s = .43$ and .36, $ts[183] = 2.67$ and 1.90, $ps = .008$ and $< .06$, respectively). Additionally, when CUS scores were not included in the regression equation, neither the three- nor the four-way interactions involving BDI or SCS scores were significant (βs ranged from $-.08$ to .18, ps ranged from .22 to .92).

Motivation to Process

In an attempt to provide converging evidence for the motivational underpinnings of participants' processing of the available information, in Study 2 we asked participants to indicate on an 11-point scale how motivated they were to come to a judgment about the case quickly. A regression analysis involving all main effects of causal uncertainty, stereotype information, goal, chronic goal importance, and all interactions was conducted. This analysis revealed a significant main effect of causal uncertainty such that high causal uncertainty participants indicated less motivation to arrive at quick judgments, $\beta = -.37$, $t(199) = -2.17$, $p = .03$. Moreover, it also yielded a significant Causal Uncertainty × Goal interaction, $\beta = -.37$, $t(199) = -2.13$, $p < .04$. Tests of the simple slopes indicated that high, but not moderate or low, causal uncertainty participants were significantly less motivated to make a quick decision in the accuracy compared to no-goal conditions, $\beta = -.58$, $t(199) = -2.66$, $p < .01$. Although we had expected a main effect of goal condition, these results provide at least partial support for high causal uncertainty participants' willingness to expend cognitive effort in the avoidance of stereotype-based judgments, particularly in the accuracy goal conditions.

Discussion

The results of Study 2 were consistent with predictions and with the results of Study 1. In the no-goal conditions, only for participants low in chronic causal uncertainty and low to moderate in the general importance of causal understanding did the availability of stereotype information exert an influence on judgments of the target's guilt. The judgments of those participants who were high in chronic causal uncertainty concerns, who valued highly the goal of causal understanding, or whose accuracy motivation had been heightened by the situational goal manipulation were not so influenced. Finally, no moderation of stereotype or causal uncertainty effects by participants' levels of depressive symptomatology or personal control was observed.

Study 3

In the first two studies, we examined the moderation of stereotype usage by individual differences in participants' chronically accessible causal uncertainty beliefs. To be sure, such individual differences are the major focus of Weary and Edwards's (1996)

causal uncertainty model. Those authors also noted, however, that causal uncertainty beliefs should be available for all people. The motivational sequelae of belief activation, then, should follow even for those individuals who possess available, but not chronically accessible, causal uncertainty beliefs. Although such beliefs should be more circumscribed and less extreme because of less frequent activation, once activated by contextual factors, the derivative cognitive-motivational effects should be observable.

In Study 3, we attempted to activate with a priming procedure the available, but not necessarily chronically accessible, causal uncertainty beliefs of half of our participants in the stereotype and no-stereotype information conditions. The other participants were exposed to a neutral priming procedure. In addition, we assessed the chronicity of participants' causal uncertainty beliefs. We expected that in neutral prime conditions, the guilt ratings of participants who scored low but not high on the CUS would be greater under stereotype than no-stereotype information conditions. In the causal uncertainty prime conditions, however, we expected no greater reliance on the stereotype information by those participants who scored low than by those who scored high on the CUS. That is, all participants were expected to be motivated to reduce causal uncertainty.

Method

Participants

In partial fulfillment of their course requirements, 132 introductory psychology students (88 women, 44 men) participated in Study 3. Random assignment by sequential blocks was used to assign participants to one of two stereotype conditions and to one of two priming conditions. Three female participants were excluded because they correctly guessed that the purpose of the experiment was to investigate stereotyping. Consequently, the final analyses were conducted using the remaining 129 participants (85 women, 44 men).

Procedure

With the exception of the additional priming manipulation (Weary & Jacobson, 1999; Williams, 1993), the procedure was similar to that used in Study 1. Participants were scheduled in groups of 3, but they completed all of the experimental tasks in separate rooms. On their arrival, a female experimenter explained to the participants that because she had some extra time in her study, they would be engaging in two separate experiments. The first study was an investigation of memory processes and, for that experiment, they would be receiving their instructions via audiotape from the male experimenter who was conducting it. Participants were instructed that as soon as they were shown to a room they should press the play button on the tape recorder to begin working on the experiment.

At the beginning of the tape, participants were told that they would be memorizing a list of 10 sentences for 4 minutes and that they later would be asked to recall these sentences. One set of 10 sentences constituted the causal uncertainty prime and consisted of two filler sentences ("In my experience, the timing of things sometimes can turn a disadvantage into an advantage" and "It is difficult for anyone to resist my reasonable requests"), plus the eight items that loaded the highest on the one-factor solution for the CUS (Weary & Edwards, 1994). The other set of 10 sentences consisted of the two fillers plus eight additional neutral statements that had been pretested and found to have no causal uncertainty or

gender differences in terms of their favorability or how characteristic they were of participants.[5]

To study the sentences, participants were directed to remove the index cards from the envelope that had been placed on the desk prior to their arrival. One sentence had been typed on each of the 10 cards. After 4 minutes, the male experimenter told the participants to return the cards to the envelope and to open the door of the room. They then exchanged the envelope containing the index cards for a larger one that contained the remaining tasks. This other envelope contained color-coded sheets of paper in matching folders that also were numbered sequentially to assist participants in finding and completing the next three tasks.

After 30 seconds had expired, the male experimenter asked the participants to remove the red folder from inside the envelope and to take out the pink sheet. This sheet indicated that the experimenter was interested in their memory for new, as well as familiar, information. They then were instructed to list as many states in the United States as they could remember before time expired. After working on this filler task for 1 minute, they were directed to return the pink sheet to the red folder and to place it back in the envelope.

Next, participants were instructed to remove the blue folder from the envelope. They were informed that they now would be asked to recall the sentences they had memorized earlier and that they should take out the blue sheet contained in the blue folder. All 10 sentences were listed on this sheet; however, each sentence was missing four to six words that were represented in the sentences by blank lines. The participants were asked to write in the missing words.[6] Because they were given an unlimited time to complete this portion of the experiment, they were told to turn off the tape until they had finished the task. When they restarted the tape, the male experimenter asked them to put the blue sheet in the blue folder and to place it in the envelope.

For the final task, the participants were asked to remove the yellow folder from the envelope and to take out the yellow sheet. This last exercise also was intended to serve as a filler task, but it was presented as a test of spatial memory. Participants were asked to write down directions for someone who wanted to travel from the building in which the experiment was being held to the student union. They were given 1 min to complete this task, after which time they were told to return the yellow sheet to the yellow folder and to place the folder back in the envelope. Finally, they were thanked for their participation in the memory experiment and told to give the envelope containing all three folders to the female experimenter.

When the participants informed the female experimenter that they had finished with the first experiment, she returned with them to the room in which they had been working. She turned on the computer monitor and asked the participants to follow the directions on the screen. The general procedure for this second experiment was identical to that used in Studies 1 and 2.

Results

Causal Uncertainty Scores

Because 8 of the 10 items in the causal uncertainty prime condition were actual questions from the CUS, participants' scores were collected at the beginning of the quarter as part of a mass screening. The mean CUS score was 35.14 (SD = 10.26). To determine whether randomization had been effective, we conducted a regression analysis. Participants' prescreening CUS scores were regressed onto effects-coded prime condition variable (causal uncertainty prime = 1, neutral prime = -1) and stereotype information condition variables (stereotype condition = 1, no-stereotype condition = -1), and their interaction. There were no significant effects for this analysis (ps > .40).

Measure of Perceived Guilt

To test whether causal uncertainty moderated the influence of stereotype information on guilt judgments, we conducted a regression analysis. The regression model consisted of standardized continuous CUS scores, effects-coded prime and stereotype information condition variables, plus all of the interactions as predictors of the participants' guilt likelihood ratings. Unlike Studies 1 and 2, the Causal Uncertainty × Stereotype Information interaction was not significant (p = .67). Indeed, although the Prime × Stereotype Information interaction approached conventional levels of significance, β = $-.29$, $t(121)$ = -1.75, p = .08, the only significant effect was the Causal Uncertainty × Prime × Stereotype Information interaction, β = .37, $t(121)$ = 2.01, p < .05.

To simplify interpretation of the three-way interaction, we conducted tests of the simple slopes of the stereotype condition lines for high, moderate, and low levels of causal uncertainty for each prime condition (see Table 2 for the regression coefficients). Within the causal uncertainty prime condition, there were no significant effects of stereotype information on guilt ratings at any of the three levels of the CUS, although a marginally significant slope (p < .09) for low causal uncertainty participants was suggestive of a trend toward overcorrection. In the neutral prime condition, the slope for the low causal uncertainty participants was as expected; they judged the target as higher in guilt in the stereotype compared to the no-stereotype condition. Similarly, the simple slope for moderate causal uncertainty participants indicated a significant, positive effect for stereotype information. The simple slope for the high causal uncertainty participants was, as expected, not significant.

Secondary Analyses

The SCS and a three-item measure of state affect were administered in counterbalanced order at the end of Study 3. The affect items asked participants to indicate on 5-point scales (1 = not at all, and 5 = extremely) how happy, contented, and satisfied they were feeling. Because ratings on these items were highly correlated with one another (rs from .52 to .60, ps < .001), they were averaged to create an index of positive affect (Cronbach's α = .80). Scores on this index were significantly correlated with the CUS scores; for the CUS with SCS and affect measures, rs = .18 and $-.22$, and ps < .02 and .05, respectively.

To try to rule out a lack of personal control or state affect as potential explanations for the causal uncertainty results obtained in this study, we conducted two additional regression analyses. These regression models consisted of standardized continuous CUS scores, the prime and stereotype information variables, and stan-

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[5] Weary and Jacobson (1999) demonstrated that the priming manipulation was effective and that the uncertainty beliefs temporarily activated by the causal uncertainty prime were specific to uncertainty about causal understanding, Causal Uncertainty × Prime interaction, β = .25, $t(110)$ = 2.57, p = .01, and did not generalize to noncausal (frequency) judgments (all ps > .35).

[6] It is not surprising that given the thematic nature of the primes in the causal uncertainty prime condition, participants recalled a greater number of those primes compared to neutral prime sentences, β = .56, $t(121)$ = 2.92, p = .004.

Table 2

Effects of Causal Uncertainty Scale Scores and Prime Condition on Stereotype Use in Guilt Likelihood Ratings (Regression Coefficients)

Prime condition	Level of causal uncertainty		
	Low	Moderate	High
Causal uncertainty prime	−.58	−.14	.31
Neutral prime	.73*	.44*	.15

Note. Significant positive coefficients are evidence of stereotyping (i.e., higher guilt ratings in the stereotype condition compared to the no-stereotype condition), nonsignificant coefficients are indicative of no stereotyping, and significant negative coefficients may be evidence of over-correction for the stereotype information.

* $p < .05$.

dardized continuous scores from one of the two other measures. In addition, each model included all of the two- and three-way interactions. With the SCS included in the equation, the only significant effect was the Causal Uncertainty × Prime × Stereotype Information interaction ($p = .03$). For the analysis that included the state affect index, there was a significant Causal Uncertainty × Affect × Stereotype Information interaction, $\beta = .44$, $t(121) = 2.08$, $p < .04$; however, none of the simple slope tests for the Causal Uncertainty × Stereotype Information interaction conducted within levels of affect were significant (all $ps > .14$).[7] Although the Causal Uncertainty × Prime × Stereotype Information interaction became marginally significant, $\beta = .22$, $t(121) = 1.72$, $p = .087$, in this analysis, the simple slope test for the effect of the stereotype information condition variable remained significant for the moderate causal uncertainty participants, $\beta = .48$, $t(121) = 1.97$, $p = .05$, and was marginally so for the low causal uncertainty participants, $\beta = .87$, $t(121) = 1.80$, $p = .08$. Additionally, when CUS scores were not included in the regression equation, neither of the three-way interactions involving SCS or state affect scores was significant (for these interaction terms, both $\beta s = -.03$ and $ps > .86$).

Consequently, it does not appear that either of these two other variables moderated the influence of stereotype information on guilt judgments. It also does not appear that control beliefs or state affect moderated the causal uncertainty or prime results obtained in our study.

Motivation to Process

To provide converging evidence for the role of accuracy motivation in the moderation of stereotype usage, we included a question that asked participants to indicate on an 11-point scale the degree to which they were motivated to accurately understand the case. An analysis that included standardized CUS scores, the prime and stereotype information variables, and the interaction terms revealed a marginally significant interaction of Causal Uncertainty × Prime, $\beta = .32$, $t(121) = 1.67$, $p = .098$. Subsequent tests of the simple slopes indicated only that participants who scored high on the CUS reported greater accuracy motivation in the causal uncertainty compared to the neutral prime condition, $\beta = .54$, $t(121) = 2.11$, $p = .04$. It seems possible that only individuals who have chronically accessible causal uncertainty beliefs and accuracy

goals may have introspective access to the cognitive motivations underlying their judgmental processes (cf., Nisbett & Wilson, 1977). Such a suggestion would be consistent with Study 2 results regarding participants' reports of their processing motivations.

Discussion

The results of Study 3 add significantly to those of Studies 1 and 2. Whereas the earlier studies demonstrated reduced use of the stereotype information by highly motivated participants (i.e., those high in chronic causal uncertainty beliefs, those for whom causal certainty is a chronically important goal, or those in accuracy goal conditions), the results of Study 3 demonstrated a similar reduction, even among participants whose causal uncertainty beliefs were not chronically accessible. More specifically, when the available causal uncertainty beliefs of those participants who scored low on the CUS were primed, then their judgments indicated no greater guilt on the part of the student-defendant as a function of the presence of the stereotype information. Similar results were obtained for those participants in the causal uncertainty prime condition who scored at moderate or high levels of causal uncertainty. The causal uncertainty results in the neutral prime conditions of Study 3 were largely consistent with those obtained in the early studies; low causal uncertainty (and, here, moderate causal uncertainty) participants relied on the stereotype information in making their guilt ratings. Finally, as in Studies 1 and 2, secondary analyses also indicated that neither participants' levels of personal control nor their levels of state affect accounted for the major findings of Study 3.

Beyond adding converging evidence for the role of activated causal uncertainty beliefs in moderating the use of stereotypes, the current studies also add to existing evidence relevant to key assumptions of the causal uncertainty model. Recent research (Edwards & Weary, 2000) using the Stroop paradigm has indicated that chronic causal uncertainty beliefs, as indexed by high scores on the CUS, can be modeled as chronically accessible constructs. The model also holds, however, that causal uncertainty beliefs are available for all people. It should, then, be possible to activate temporarily such beliefs and to observe the associated motivational consequences, even among individuals who are nonchronic for these beliefs. Study 3 provides the first test of and supportive evidence for these notions. The theory also suggests that activation of nonchronic compared to chronic causal uncertainty beliefs requires more salient, detailed, or elaborate situational information. Future research that varies the strength of primes could provide a valuable additional test of the chronicity notion.

Meta-Analysis of Studies 1–3

All three studies discussed in this article yielded significant interactions consistent with our hypotheses that the guilt judg-

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[7] We also examined the slopes for all other types of simple effects involved in this three-way interaction. Only one (marginally) significant effect was obtained, and that occurred when we examined the Stereotype Information × Affect interactions within each of the three levels of causal uncertainty. Specifically, among low causal uncertainty participants, those with high compared to low positive affect rated the student as more guilty in the no-stereotype condition, $\beta = .73$, $p < .06$.

ments of low causal uncertainty participants in the absence of conditions designed to motivate increased processing would show evidence of stereotype usage, whereas the judgments of high causal uncertainty participants would not. Still, two of our nine simple slopes tests actually suggested that high causal uncertainty participants might, in fact, be showing overcorrection for the stereotype information. A meta-analysis of our findings, however, revealed that this overcorrection effect was not significant across the studies. Specifically, a meta-analysis of the simple slopes for high causal uncertainty participants across all conditions in each of the studies yielded an average effect size of $r = .05$, $t(8) = 1.76$, $p = .12$. Moreover, the test for homogeneity of effect sizes was nonsignificant, $\chi^2(8, k = 9) = 8.54$, $p = .38$. For low causal uncertainty participants, an initial analysis revealed significant heterogeneity of effect sizes, $\chi^2(8, k = 9) = 25.71$, $p = .001$; as a consequence, a search for potential moderators was initiated. A particularly likely candidate entailed a grouping of conditions across studies where we either did or did not expect relatively greater motivation to process on the part of low causal uncertainty participants (i.e., where accuracy goals or causal uncertainty beliefs would or would not have been activated, and where causal understanding would or would not have been viewed as important). This analysis yielded an average effect size indicative of significant stereotyping among conditions where relatively little motivation was expected, average $r = .19$, $t(3) = 12.06$, $p = .002$, $\chi^2(3, k = 4) = 0.62$, $p = .89$. The meta-analysis of the other five conditions where we expected a priori more systematic processing on the part of low causal uncertainty participants yielded a marginally significant average effect size, $r = -.06$, $t(4) = -2.33$, $p = .08$, $\chi^2(4, k = 5) = 2.06$, $p = .73$. These latter results, then, might suggest that corrections for stereotypes may be less well-calibrated among participants who typically do not process available information in a careful, systematic fashion. There is, however, no reliable evidence that individuals high in causal uncertainty overcorrect for the stereotype information in their judgments of the target.[8]

General Discussion

In three studies, we examined the possible moderation of stereotype usage as a function of activation of chronically or temporarily accessible causal uncertainty beliefs. In all three, we found evidence consistent with the notion that activation of such beliefs was associated with a decreased reliance on the stereotype-relevant category information. More specifically, we found that only among participants whose causal uncertainty beliefs had not been activated were ratings of a defendant's guilt higher when the stereotype information was available.

Why might activation of available causal uncertainty beliefs be related to reduced stereotyping? We have suggested that activation of such beliefs, either by the task instructions or by temporary primes, activated subjective accuracy concerns, thereby resulting in a more systematic consideration of all available information. Indeed, three different checks on our participants' processing motivations, as well as direct manipulations of their accuracy concerns, provided some support for this argument. This is particularly noteworthy given the well-known problems in obtaining self-reports of such motivations (Pelham & Neter, 1995). But

could there, perhaps, be other, plausible explanations for our causal uncertainty results?

One possible explanation for our causal uncertainty results might invoke self-presentational or social desirability concerns. That is, individuals who score high on the CUS might well be more attuned to the implications of their target judgments for their self-image or for others' impressions of them. They, therefore, might have avoided the use of stereotypes in order to project a more favorable image of themselves, rather than because of a tendency to engage in a more systematic and thoughtful processing of the available information. Indeed, our Study 2 findings of lesser stereotyping on the part of accuracy goal condition participants could similarly be explained by their possibly greater social desirability concerns. Although we cannot rule out this possibility with respect to the accuracy goal findings of Study 2, individual differences in causal uncertainty beliefs have been shown to be unrelated to social desirability (Weary & Edwards, 1994). Moreover, the responses of participants high in causal uncertainty to the personal control and depression measures used in Study 2 would suggest that they are more, rather than less, willing to convey negative impressions of the self.

We also note that a collateral research program (Tobin, Weary, Wichman, & Jacobson, 2001), using identical general procedures to the studies reported herein, has found CUS scores to be related to the Motivation to Control Prejudice Reactions Scale (Dunton & Fazio, 1997) and to several of the subscale scores of the Need for Closure Scale (Webster & Kruglanski, 1994). However, when scores from these scales and their subscales were included, along with CUS scores, in separate regressions predicting participants' guilt ratings, the interaction of causal uncertainty and stereotyping that was found in our research was also obtained (ps ranged from .008 to .02).

A final alternative explanation for our findings might entail not motivational but response style differences of participants high and

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[8] The current research was not conducted with the goal of discovering the reason for any baseline (no stereotype) differences in high and low causal uncertainty individuals' ratings of the student's level of guilt. However, in two out of nine instances, the ratings of our high compared to low causal uncertainty participants were significantly higher. It is not surprising that an initial meta-analysis indicated significant heterogeneity of effect sizes, $\chi^2(8, k = 9) = 15.39$, $p = .05$. A subsequent meta-analysis of the results of the conditions where a priori we would have expected cognitive effort to differ as a function of participants' causal uncertainty levels (i.e., where accuracy goals or causal uncertainty beliefs would or would not have been activated, and where causal understanding would not have been viewed as important) yielded a significant average effect size, average $r = .14$, $t(3) = 5.64$, $p < .02$, $\chi^2(3, k = 4) = 1.07$, $p = .78$. A similar analysis was not significant for those conditions where no such differences were expected, average $r = -.04$, $t(4) = .85$, $p = .45$, $\chi^2(4, k = 5) = 5.15$, $p = .27$. Although speculative, we would suggest that perhaps high compared to low causal uncertainty participants characteristically have a tendency, when they try but fail to find any explanatory organizing theme underlying the available social information (i.e., no stereotype), to attribute the target's behavior to an inherent deficiency in his or her personality. Such a possibility would be consistent with their generally greater need to see the world as predictable. It also would be consistent with suggestions made by Edwards (1998) that such individuals might under certain conditions fall back on their default inferences when they feel uncertain about the results of their effortful processing of the available social information.

low in causal uncertainty. Specifically, the differences might be explained in terms of a general tendency for individuals who are chronically causally uncertain to make more moderate responses as one possible way of indicating their general judgmental uncertainty. For several reasons, we think this explanation is not particularly viable. First, previous research (Edwards et al., 1998) has directly examined the possibility of a general response tendency and has found no support for it. Moreover, where such judgmental differences between individuals high and low in causal uncertainty have been predicted and observed (Edwards, 1998; Edwards et al., 1998), the attributional judgments made by high causal uncertainty individuals have been more extreme. Overall, then, it seems more likely that the lesser influence of stereotype information by high causal uncertainty participants in all three studies resulted from a greater willingness to expend cognitive resources in the service of subjective accuracy goals.

Caveats

In the current research, we have adopted the currently dominant view of stereotypes as simplistic impressional devices that perceivers may use with minimal cognitive effort expenditure to render their worlds more understandable, predictable, and controllable. We want to point out, however, that several authors (e.g., Spears & Haslam, 1997; Yzerbyt, Rocher, & Schadron, 1997) have argued that social categorization and stereotyping sometimes may represent effortful processes. Still others (e.g., Gilbert & Hixon, 1991) have argued that the characterization of stereotyping as relatively effortless fails to take into account possibly important resource differences in component processes (activation vs. application).

Although future research will need to delineate the conditions under which stereotyping does or does not require cognitive resources, it would appear that there is little controversy surrounding the fundamental point that the use of categories and stereotypes is engendered by perceivers' needs to augment the available stimulus information and thereby to improve social meaning. Two critical determinants of the use of categories and stereotypes are their perceived relevance and appropriateness.

Our suggestion that participants whose causal uncertainty beliefs are activated should be more likely to avoid the default use of the category information was premised upon the notion that they would be more motivated to form the most valid assessment possible of the target's guilt. Such an assessment would seem to require an analysis of the diagnosticity, relevance, or appropriateness of particular pieces of information, including the category-based stereotype information. To the degree that such an analysis requires some amount of both motivation and ability (cognitive resources), we would predict in the present paradigm greater reliance on the target-category cue as the only available (and probably low-cost) way to enhance the meaning of the case information if adequate levels of one or the other are not present. Although these speculations are consistent with past research on causal uncertainty and preferences for diagnostic information (Weary & Jacobson, 1997), future research will need to examine directly and within the context of the current paradigm the validity of this notion.

Conclusion

In three studies, we have shown that activation of either chronic or temporary causal uncertainty beliefs is associated with a lesser reliance on or use of stereotypes. Additionally, individual differences in the belief of the importance of possessing an accurate social understanding and a manipulation of an accuracy goal produced similar results. These findings, then, are consistent with the notion that the reduced usage of stereotypes resulted from participants' desire to avoid making an erroneous, category-based target judgment. Moreover, the secondary analyses conducted for all three studies indicate that the effects of causal uncertainty on stereotype usage uncovered here are not accounted for by its major cognitive or affective correlates. The results of the current research, then, provide support for several critical arguments of the causal uncertainty model and for the discriminant validity of the causal uncertainty scale.

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The Publications and Communications Board has opened nominations for the editorships of *Journal of Experimental Psychology: Animal Behavior Processes, Journal of Personality and Social Psychology: Personality Processes and Individual Differences, Journal of Family Psychology, Psychological Assessment,* and *Psychology and Aging* for the years 2004–2009. Mark E. Bouton, PhD, Ed Diener, PhD, Ross D. Parke, PhD, Stephen N. Haynes, PhD, and Leah L. Light, PhD, respectively, are the incumbent editors.

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