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## **CATEGORIZATION UNDER UNCERTAINTY: RESOLVING VAGUENESS AND AMBIGUITY WITH EAGER VERSUS VIGILANT STRATEGIES**

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Attempts to categorize others' actions often involve uncertainty. In this article, two variables are identified that could influence this categorization under uncertainty. The first variable is whether the type of uncertainty created by a particular behavior arises from generally weak evidence (i.e., *vagueness*) versus generally strong, but conflicting evidence (i.e., *ambiguity*). The second variable is whether people have general preferences for the use of gain-focused (i.e., *eager*) versus loss-focused (i.e., *vigilant*) strategies of resolving such uncertainty. Three studies demonstrate that, when a target's behaviors are vague, preferences for eager decision strategies lead people to apply more possible categories to this target than do preferences for vigilant decision strategies. In contrast, when behaviors are ambiguous, preferences for vigilant decision strategies lead people to apply more possible categories than do preferences for eager decision strategies. The implications of these results for categorical inferences based upon uncertain social targets are discussed.

Individuals are frequently encountered who defy clear categorization. That is, most behaviors, and the people who perform them, can be categorized in multiple ways. For example, imagine that I have a colleague at work, Neil, with whom I've never spoken, but who I occasionally see

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at lunch sitting by himself and reading a novel. This might indicate that Neil is shy, has a passionate love of reading, enjoys a moment of solitude during the middle of the day, or several other possibilities. Alternatively, imagine that I have a partner, Donald, with whom I work closely and who always seems to pursue things relentlessly, refusing to give up even when it might have been better if he had. This might indicate either that Donald is commendably persistent or that he is foolishly stubborn. In many instances, then, attempts to categorize others' behaviors involve a degree of uncertainty.

How is such uncertainty resolved? Given that the trait- and social-category labels that people ultimately choose for a target provide a foundation for many future inferences and evaluations, this question has been of great interest to psychologists and has inspired much research (e.g., Anderson, 1991; Malt, Ross, & Murphy, 1995; Trope, 1986; for reviews, see Higgins, 1996; Macrae & Bodenhausen, 2000). This research has typically focused on two broad classes of variables. The first class relates to the cognitive mechanisms involved in encoding categorical information in the presence of uncertainty. This includes factors such as the amount of processing resources required for the activation of different alternate categories (e.g., Gilbert & Hixon, 1991) or the influence of recently or frequently activated categorical knowledge on which particular category is selected among these alternatives (Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). The second class relates to the specific outcomes that are motivating uncertainty resolution. This includes factors such as perceivers' general desires for a thorough or limited consideration of different alternate categories (Dijksterhuis, van Knippenberg, Kruglanski, & Schaper, 1996; Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997) or their more specific desires to select particular alternatives that facilitate self-serving conclusions (Sinclair & Kunda, 1999; Spencer, Fein, Wolfe, Fong, & Dunn, 1998).

Previous work on how different cognitive mechanisms and motivated outcomes affect categorization under uncertainty has done much to explain what types of categories people apply to a given behavior or target. In addition to the types of categories that people choose, however, another important factor in the categorization of uncertain behaviors or targets that has been less widely studied is the total *number* of alternate categories that they retain or reject. Just as the specific category labels that perceivers apply to someone's behaviors can have important implications for their inferences about, and evaluations of, this person, so too can the number of category labels they apply. For example, selecting a relatively small number of categories to describe an uncertain behavior could foster a greater sense of resolution and increase the likelihood of further inferences about the person performing the behavior. However, retaining a relatively large number of categories for an uncertain behav-

ior may not provide this sense of resolution and decrease the likelihood of further inferences (Bodenhausen, Macrae, & Sherman, 1999; Fiske & Neuberg, 1990; see also Anderson, 1991; Kelley, 1973; Malt et al., 1995). Examining variables that affect how many categories people attach to uncertain social targets and behaviors could thus, ultimately, have important implications for research on inference and evaluation.

Therefore, in this article, we examine two additional classes of variables that could influence the number of alternate categories that perceivers apply to uncertain targets. These are the *type of uncertainty* created by a particular target and perceivers' *motivated decision strategies* for resolving such uncertainty.

#### TYPES OF UNCERTAINTY: VAGUENESS VERSUS AMBIGUITY

In psychology, *uncertainty* is often treated as a single uniform concept that simply represents the absence of precise information. However, in some instances, important distinctions have been made between different varieties of uncertainty and the different conditions that produce them. One of these distinctions that has been made in both the literature on decision under uncertainty (Wallsten, 1990) and on knowledge activation (Higgins, 1996) is between instances of uncertainty that are *vague* and those that are *ambiguous*.

Vague uncertainty exists when there is a general lack of information regarding a judgment or a particular target. In terms of categorization, a vague target would be one where there is only weak evidence for membership to any specific category (Higgins, 1996; see also Osherton & Smith, 1982; Wallsten, 1990). Therefore, the challenge of categorizing these targets is the difficulty of knowing *which, if any, of the weak alternatives to accept*. For example, consider Neil from the examples discussed at the beginning of the article. Sitting by oneself and reading a novel is only weakly related to the categories *shy, passionate reader, or lover of solitude*. Someone attempting to categorize Neil would thus be faced with vague uncertainty and would have to decide whether any of these categories could be accurate.

In contrast, ambiguous uncertainty exists when there is an abundance of conflicting information regarding a possible judgment or a particular target. In terms of categorization, an ambiguous target would be one where there is strong evidence for membership in two or more mutually exclusive categories (Higgins, 1996; Trope, 1986; Wallsten, 1990). Because each alternate category has strong evidence to support it, it is not difficult to accept any one of them; each alternative by itself could provide a clear answer. Instead, the challenge of categorizing ambiguous targets is the difficulty of knowing *which, if any, of the strong alternative(s) to eliminate*. For example, consider Donald from the examples discussed

at the beginning of the article. Not giving up even after he probably should have is strongly related to both the positive category *persistent* and the evaluatively conflicting negative category *stubborn*. Someone attempting to categorize Donald would be thus faced with ambiguous uncertainty and, although each conflicting alternative appears to be highly accurate, would have to decide which one to choose and which one to eliminate.<sup>1</sup>

How might the different interpretive challenges posed by vague versus ambiguous targets affect the number of categories applied to these targets? As is discussed further below, we propose that this question cannot be properly addressed without considering people's motivations for different strategies of uncertainty resolution.

### MOTIVATED DECISION STRATEGIES: EAGERNESS VERSUS VIGILANCE

As mentioned earlier, previous research on people's categorization of others' uncertain actions has included motivational perspectives. This research has examined how individuals who analyze uncertain actions with certain preferred outcomes (e.g., to label others in a way that bolsters or protects their self-views) tend to resolve the uncertainty using categories that best support those outcomes (e.g., Dunning, Perie, & Story, 1991; Sinclair & Kunda, 1999; Spencer et al., 1998). In contrast, we take a separate, but complementary, motivational perspective. We propose that, independent of whatever preferred outcome is motivating their social categorizations, people can also be motivated to reach these outcomes using certain preferred decision strategies (see Higgins, 2000; Higgins & Molden, 2003; Molden, 2003; Molden & Higgins, in press).

What are some examples of such *strategic preferences* and how are they distinct from *outcome preferences*? These questions have been addressed by recent research concerning the effects of people's *regulatory focus* on their judgments and decisions (Crowe & Higgins, 1997; Friedman & Förster, 2001; Förster, Higgins, & Bianco, 2003; Liberman,

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1. There are, of course, other possible types of uncertainty as well. For example, a target may show strong evidence for membership in two or more categories that are not conflicting; someone may possess multiple features that clearly indicate that she is a woman, a wife, a mother, and a lawyer all at the same time. Although the configuration of information that exists for these types of targets, which have been referred to as *cross-classified* (e.g., Murphy & Ross, 1999), does not create the same degree of uncertainty as ambiguous or vague targets, it is possible that perceivers still may, at times, face a decision about which one of these categories predominates or is currently most relevant (see Bodenhausen et al., 1999). Therefore, although cross-classified targets were not included in the studies presented here, they could be an important topic of future research, as is discussed below.

Molden, Idson, & Higgins, 2001; see Higgins, 1997). Regulatory focus theory distinguishes between two basic motivational orientations. The first involves *promotion concerns* with advancement and a focus on attaining gains versus avoiding nongains. The second involves *prevention concerns* with security and a focus on attaining nonlosses versus avoiding losses.

Because promotion concerns center on gains and advancement, it has been proposed that these concerns create a preference for *eager* decision strategies that involve identifying correct hypotheses (Crowe & Higgins, 1997; Liberman et al., 2001; see Higgins & Molden, 2003). Using signal detection terminology (Tanner & Swets, 1954; see also Trope & Liberman, 1996), eager strategies represent a focus on increasing *hits* to ensure gains (i.e., choosing correct hypotheses) and avoiding *errors of omission* to ensure against nongains (i.e., overlooking correct hypotheses). Such strategies thus constitute a "risky" approach to decision making where it is better to commit to a choice that might be correct, and risk being wrong, than it is to fail to commit to this choice and possibly miss being right.

In contrast, because prevention concerns center on losses and security, it has been proposed that these concerns create a preference for *vigilant* decision strategies that involve rejecting incorrect hypotheses (Crowe & Higgins, 1997; Liberman et al., 2001; see Higgins & Molden, 2003). Again using signal detection terminology, vigilant strategies represent a focus on increasing *correct rejections* to ensure nonlosses (i.e., eliminating incorrect hypotheses) and avoiding *errors of commission* to ensure against losses (i.e., falsely accepting incorrect hypotheses). Such strategies thus constitute a "conservative" approach to decision making where it is better to fail to commit to a choice that might be correct, and possibly miss being right, than it is to commit to this choice and risk being wrong. Several experiments that have directly tested these proposals using tasks related to signal detection (e.g., identifying "old" versus "new" items in a test of recognition memory) have confirmed that promotion concerns motivate eager decision strategies and prevention concerns motivate vigilant decision strategies (Crowe & Higgins, 1997; Friedman & Förster, 2001).

How might such motivated decision strategies affect people's approach to the categorization of uncertain targets? In general circumstances, everyone who encounters an uncertain instance of behavior is presumably focused on the outcome of accurately resolving the uncertainty. However, different individuals could still have different strategic preferences for reaching this outcome. Those with promotion concerns should be motivated to eagerly select categories that might be "correct" at the risk of committing to one or more that are "incorrect." In contrast, those with prevention concerns should be motivated to vigilantly guard

against selecting categories that might be "incorrect," even though this might lead them to overlook one or more that are "correct."<sup>2</sup>

### RESOLVING VAGUENESS AND AMBIGUITY WITH EAGER VERSUS VIGILANT STRATEGIES

How then might the eager decision strategy associated with promotion concerns and the vigilant decision strategy associated with prevention concerns affect the categorization of vague versus ambiguous targets? Vague targets display generally weak evidence for category membership. The interpretive challenge is thus to decide which, if any, of the weak alternatives to accept. When the evidence for any possible category is weak, no one alternative provides a clear answer, or "hit." Selecting many possible categories is thus the only way to create opportunities for "hits" and find alternatives that might correctly describe a vague target. However, this also risks committing multiple errors by endorsing a number of weak alternatives that incorrectly describe this target.

Such a risky approach should be favored by those who prefer eager decision strategies that emphasize seeking correct hypotheses even at the risk of committing mistakes. Therefore, people with promotion concerns should select many possible categories for vague targets to maximize opportunities for hits and ensure that no potentially correct categories have been overlooked. In contrast, this risky approach should not be favored by those who prefer vigilant decision strategies that emphasize guarding against incorrect hypotheses even though they might omit something correct. Therefore, people with prevention concerns should instead select few possible categories for vague targets and

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2. It is important to note that this analysis does not suggest that people's regulatory focus or eager versus vigilant strategic preference is related to their larger approach versus avoidance goal orientations (Higgins, 1997). That is, the motivated decision strategies that are proposed to arise from promotion versus prevention concerns are not analogous to general motivations for approaching success versus avoiding failure (e.g., Atkinson, 1957) or motivations for moving toward a positive reference point versus moving away from a negative reference point (e.g., Carver & Schier, 1990). Thus, when people categorize uncertain targets, their motivations to approach successful outcomes, and correctly identify these targets, or to avoid unsuccessful outcomes, and guard against incorrectly identifying these targets, should be independent of their regulatory focus (for empirical confirmation of this independence in other domains, see Crowe & Higgins, 1997; Förster, Grant, Idson, & Higgins, 2001; Förster, Higgins, & Idson, 1998; Higgins, Roney, Crowe, & Hymes, 1994; Liberman et al., 2001). What this analysis instead suggests is that people's regulatory focus creates differences in their approach (finding correct hypotheses) versus avoidance (eliminating incorrect hypotheses) *strategic* orientations when pursuing these types of outcomes.

largely relinquish opportunities to obtain hits in favor of ensuring that they have not falsely endorsed any incorrect categories (see also Liberman et al., 2001).

In contrast to vague targets, ambiguous targets display strong but conflicting evidence for category membership. Because each alternative has strong supporting evidence, the interpretive challenge is thus to decide which, if any, of these alternatives to eliminate. When the evidence for several possible categories is strong and conflicting, each of the alternatives appears to provide a clear answer, or "hit," on its own, but can only be endorsed if the other alternatives are simultaneously rejected. Selecting one possible category and eliminating the others is thus the only way to create an opportunity for a hit and identify the alternative that correctly describes an ambiguous target. However, this also risks committing an error by choosing to endorse an alternative that incorrectly describes this target and to eliminate the alternative that correctly describes it.

Such a risky approach should again be favored by those who prefer eager decision strategies. Therefore, people with promotion concerns should choose a single possible category for ambiguous targets and eliminate other alternatives to ensure that they have some opportunity for a hit even at the risk of committing a mistake. In contrast, this risky approach should again not be favored by those who prefer vigilant decision strategies. Given the strong evidence for each competing alternative, accepting only one alternative means eliminating an alternative that could be the correct one. People with prevention concerns should therefore refuse to eliminate any of the alternatives to ensure that they do not accept an incorrect alternative while eliminating the correct one (i.e., commit an error), even though this passes up any opportunity for a hit. Thus, they should refrain from choosing a single possible category and retain all of the alternatives for ambiguous targets.

## OVERVIEW OF THE PRESENT STUDIES

Three studies were performed to test these hypotheses and to explore how different types of uncertainty, as well as different preferred methods of resolving this uncertainty, can affect the number of categories people apply to uncertain social targets. In Study 1a, participants completed a priming manipulation that activated either promotion concerns or prevention concerns and then categorized either several vague or several ambiguous instances of behavior. These participants made categorizations by writing their impressions of the target who performed this behavior in a free-response format. To extend these results, in Study 1b, instead of a priming manipulation, participants completed

an individual differences measure of their chronic promotion versus prevention concerns and then performed the same categorization task as before. Finally, to extend these results further, in Study 2 participants again completed an individual differences measure of their chronic promotion versus prevention concerns and then categorized an ambiguous instance of behavior by rating the likelihood that the target who performed this behavior belonged to each of two different categories.

Across all three studies, it was predicted that participants with strong promotion concerns would be more likely to generate (or give high membership ratings to) multiple categories in response to vague behaviors but only a single category in response to ambiguous behaviors, as is consistent with eager decision strategies. It was also predicted that participants with strong prevention concerns would be more likely to generate (or give high membership ratings to) multiple categories in response to ambiguous behaviors but only a few categories in response to vague behaviors, as is consistent with vigilant decision strategies.

## STUDY 1A

### METHOD

#### Participants

Participants were 110 Columbia University students (58 men and 52 women) who were paid \$5 for volunteering for the study. Gender had no significant effects. All participants indicated that English was their native language.

#### Procedure

Upon arriving, participants were greeted by an experimenter and told that they would be filling out a battery of questionnaires for several different studies. Participants were then led to individual workstations and administered a writing exercise that primed either promotion concerns or prevention concerns (see below). After completing this exercise, participants were told that they had finished "Experiment 1" and that they would now move on to the next study. At this point, they received a packet of materials that asked them to categorize either four different vague targets or four different ambiguous targets. This created a 2 (primed concerns: promotion vs. prevention)  $\times$  2 (target uncertainty: vague vs. ambiguous) factorial design. Following the categorization



task, participants completed several individual difference measures not directly relevant to the present study.<sup>3</sup>

### Materials

*Promotion and Prevention Priming Manipulation.* Work on self-discrepancy theory (see, e.g., Higgins 1987) has shown that when people think about personal goals that they hope and aspire to achieve (i.e., their *ideals*), they represent such goals in terms of advancement and view attaining them as gains and failing to attain them as nongains. Priming people's ideals, then, should temporarily induce promotion concerns. Work on self-discrepancy theory has also shown that, in contrast, when people think about goals that they believe are their duty and obligation to achieve (i.e., their *oughts*), they represent such goals in terms of security and view attaining them as nonlosses and failing to attain them as losses. Priming people's oughts, then, should temporarily induce prevention concerns.

Participants in the *promotion prime* condition were therefore asked to write an essay outlining their current hopes and aspirations and describing how these hopes and aspirations differed from the ones they had growing up. This exercise was described as part of a "lifespan development" study that was being performed by a colleague. To ensure adequate priming, participants were instructed to take some time to think about the question before they began writing and to spend approximately 10 minutes on the task. Participants in the *prevention prime* condition were given identical instructions, except that instead of their hopes and aspirations, they were asked to write about their duties and obligations. Several previous studies have demonstrated the effectiveness of these ideal or ought priming manipulations and have shown that this procedure produces results that are nearly identical to those that are found when gain/nongain and nonloss/loss contingencies are directly manipulated (e.g., Higgins, Roney, Crowe, & Hymes, 1994; Liberman et al., 2001).

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3. Among these measures were questionnaires assessing participants' chronic motivations for certain general outcomes when faced with uncertainty, including the need for cognition (Cacioppo & Petty, 1982) and the need for cognitive closure (Webster & Kruglanski, 1994). Although these measures are not central to the primary hypotheses investigated in this article, a review of the relevant literature on these constructs revealed that they too might influence people's categorization of uncertain targets (see Cacioppo, Petty, Feinstein, & Jarvis, 1996; Kruglanski & Webster, 1996). Thus, to control for these potential relations, and to ensure that any results we found reflected the independent effects of our priming manipulation, all analyses were performed using these measures as covariates. No independent effects of these variables were found. All means and degrees of freedom that are reported have been adjusted for these two variables.

*Categorization Task.* Categorization stimuli were presented in the form of several vignettes. Each of the vignettes described a target person through the narration of an observer. Participants' categorizations were assessed by asking them to write their impression of the target person after each vignette. Eight vignettes were created in all, four where the description of the target was intended to produce vague uncertainty and four where the description was intended to produce ambiguous uncertainty. Within the vague and ambiguous conditions, participants always completed the vignettes in the same order.

Vague uncertainty was created by providing only superficial information about the behaviors of the target person. This allowed a variety of possible categorizations while at the same time ensuring that the evidence for each of these categorizations remained weak. The following is an example of one of the vague targets:

...over lunch [Rob and I] began to talk about a short story that Rob had read. He told me that the literary review he had seen it in was one of his favorites. In all the time I have known Rob, he has enjoyed literature, although he has not really decided whether or not he wants to pursue it as a career.

Some of the possible categorizations that are indicated are *intellectual*, *literary*, or *indecisive*, but none of these are strongly supported by Rob's behaviors.

Ambiguous uncertainty was created by providing information about the behaviors of the target person that clearly indicated two equally plausible, but conflicting, alternatives. This forced participants to consider a choice between two mutually exclusive categorizations that each had strong supporting evidence. The following is an example of one of the ambiguous targets:

...over lunch [Rob and I] began to talk about a short story that Rob had written. He told me that the literary review he had submitted it to had rejected it, but that he thought that the story was good and that he was going to resubmit it anyway. In all the time I have known Rob, once he makes up his mind to do something, it's as good as done no matter how long it might take or how difficult the going might be. Only occasionally does he change his mind even when it might well have been better if he did.

The two conflicting categorizations that are indicated are *stubborn* and *persistent*, each of which is strongly supported by Rob's behaviors.

It is important to note that in regard to this ambiguous example (as well all of the other ambiguous targets), the conflict that exists is not a *logical* one (i.e., it is possible for a person to have stubborn and persistent

traits at the same time), but an *evaluative* one (i.e., it is not possible to form, at the same time, both a definite negative impression by labeling the person as stubborn, and a definite positive impression by labeling the person as persistent). It is also important to note that all of the ambiguous targets were adapted from those used in previous research where a large majority of people chose one of the two options instead of retaining both (Higgins, 1996: see Higgins et al., 1977). The full text of all four vague and all four ambiguous vignettes can be found in the Appendix.

## RESULTS

Five participants were eliminated for failure to follow instructions, and an additional six participants were eliminated for incomplete materials. This left the responses of 99 participants for analysis.

Two independent raters, both of whom were blind to the experimental condition, coded participants' impressions of each target person. Coding was performed on both the number and type of trait categories listed. Lenient criteria were used, and both single-word trait labels (e.g., "headstrong") and short, category-implying phrases (e.g., "trusts his own opinion") were considered equivalent. *Roget's International Thesaurus* was used to combine synonyms into single categories. Some participants described a target only as "normal" or gave a response of "no impression." Both of these responses were coded as zero categories listed. Agreement between the raters was high ( $\alpha = .89$ ), and discrepancies were resolved by discussion.

Preliminary analyses examined the contents of participants' responses to confirm that each of the vignettes produced the intended type of uncertainty. These analyses showed that, for vague targets, participants listed a wide range of categories and that even the most common categorization for each target was included by less than one third of the respondents (for more information on the specific categories associated with each vignette and how often these categories were mentioned, see Appendix). These results confirm that the evidence given in each vignette was indeed generally weak and indicate that the vignettes created the intended vague uncertainty.

Preliminary analyses also showed that, for ambiguous targets, participants listed a smaller range of categories and that close to three quarters of the respondents included either the positive or negative evaluative category (or both) that served as the basis of the ambiguity for each target (for more information on the specific categories associated with each vignette and how often these categories were mentioned, see Appendix). In addition, there were no differences concerning whether participants selected the positive or negative category for any of the targets ( $\chi^2$ s (1,  $N = 99$ ) < 2.3, all  $ps = ns$ ). These results confirm that the evidence given

for the conflicting categories in each vignette was indeed equally strong and indicates that the vignettes created the intended ambiguous uncertainty. Finally, there were no content differences in the categories listed by participants in the promotion prime and prevention prime conditions for either vague targets ( $\chi^2$ s (3-8,  $N = 99$ ) = .13-7.7, all  $ps = n.s.$ ) or ambiguous targets ( $\chi^2$ s (2,  $N = 99$ ) = .56-3.5, all  $ps = n.s.$ ).

As described above, the primary hypotheses in this study were that participants in the promotion prime condition would select multiple categories for vague targets but only a single category for ambiguous targets, whereas participants in the prevention prime condition would select only a few categories for vague targets but multiple categories for ambiguous targets. Therefore, on average, participants in the promotion prime condition should have listed a greater number of categories for the vague targets than participants in the prevention prime condition, and participants in the prevention prime condition should have listed a greater number of categories for the ambiguous targets than participants in the promotion prime condition. Analyses of the number of categories that participants listed in each condition should then reveal a significant primed concerns  $\times$  target uncertainty interaction. To test this, the number of categories that participants listed were first averaged across either all four vague targets ( $\alpha = .68$ ) or all four ambiguous targets ( $\alpha = .74$ ). These averages were then submitted to a 2 (primed concerns: promotion vs. prevention)  $\times$  2 (target uncertainty: vague vs. ambiguous) ANOVA.

Figure 1 shows that, as expected, participants in the promotion prime condition listed more categories for vague targets on average than participants in the prevention prime condition, whereas participants in the prevention prime condition listed more categories for ambiguous targets on average than participants in the promotion primed condition. As can be seen, these results reflect only the predicted primed concerns  $\times$  target uncertainty interaction effect ( $F(1, 93) = 4.1, p < .05$ ). Additional analyses that treated the number of categories that participants listed for each of the four vague or ambiguous targets as a within-participants variable instead of calculating averages produced identical results. Also, these latter analyses revealed no simple or higher order within-participants effects for either the different vague or the different ambiguous targets (all  $F$ s  $< 1$ ), indicating that these results were not influenced by the content of the vignettes.

## DISCUSSION

The findings of Study 1a support our hypotheses concerning the effects of eager or vigilant motivated decision strategies and vague and ambiguous types of uncertainty on the number of categories people apply to social targets. Individuals who were primed with promotion concerns

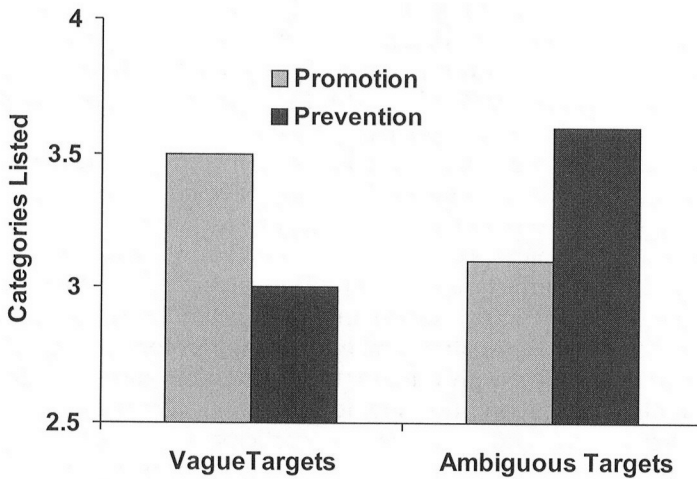


FIGURE 1. Number of categories listed for vague and ambiguous targets by participants primed with promotion versus prevention concerns.

selected more categories for vague targets and fewer categories for ambiguous targets, which is consistent with an eager decision strategy focused on identifying correct categories. In contrast, individuals who were primed with prevention concerns selected fewer categories for vague targets and more categories for ambiguous targets, which is consistent with a vigilant decision strategy focused on eliminating incorrect categories. To further test the robustness of these effects and gather convergent evidence, an additional study was conducted using the same basic procedures as Study 1a with one exception. Instead of using an experimental induction to temporarily increase the strength of participants' promotion and prevention concerns, individual differences in the chronic strength of these concerns were measured.

## STUDY 1B

### METHOD

#### Participants

Participants were 100 Columbia University students (53 men and 47 women) who were paid \$5 for volunteering for the study. Gender had no

significant effects. All participants indicated that English was their native language.

### Procedure

The procedure for Study 1b was nearly identical to that of Study 1a. Participants began by completing a measure of the strength of their predominant promotion versus prevention concerns (see description below). After this, they were told that they had finished "Experiment 1" and that they would now move on to the next study. At this point, they were asked to categorize either a single vague or a single ambiguous target ("Rob" from Study 1a, see Appendix). Finally, participants again completed additional individual difference measures not directly relevant to the present study.<sup>4</sup>

### Materials

*Predominant Concerns Measure.* Similar to the priming manipulation employed in Study 1a, measurement of the chronic strength of people's predominant promotion concerns versus prevention concerns was based upon the accessibility of their personal ideals and oughts. In Study 1a, priming was used to induce *temporary* accessibility of individuals' ideals and oughts, whereas in this study, assessments were made of the *chronic* accessibility of individuals' ideals and oughts (see Higgins, 1996, 1997).

Research on attitudes has demonstrated that the chronic accessibility of a certain attitude can be used as an index of its strength. Strong attitudes have higher chronic accessibility (i.e., greater activation potential) than weak attitudes, and therefore result in faster responses for applicable judgments (e.g., Fazio, 1995; Greenwald & Banaji, 1995). Using this theoretical framework, Higgins, Shah, and Friedman (1997) proposed that people's response latencies for the recall of their ideals and oughts could potentially be used as an indicator of the chronic accessibility (i.e., strength) of their promotion concerns and prevention concerns, respectively. Numerous studies have supported this proposition, and findings using this measure have been nearly identical to those where promotion versus prevention concerns have been primed (as in Study 1a) and those where promotion and prevention concerns have been framed using gain versus nongain and nonloss versus loss contingencies (see e.g., Förster,

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4. Need for cognition and need for closure measures were included in this study as well, and all analyses were performed using these measures as covariates. Participants' scores on the predominant concerns measure were uncorrelated with both of these measures ( $r_s < .13$ ,  $p_s = n.s.$ ). No independent effects of these variables were found, and all means and degrees of freedom that are reported have again been adjusted.

Higgins, & Idson, 1998; Liberman, et al., 2001; Shah, Higgins, & Friedman, 1998).

The ideal and ought accessibility measure was administered on a computer (for complete details see Higgins et al., 1997). Participants were presented with a general definition of ideal and ought attributes and then asked to type several of their own personal ideals and oughts one at a time using the computer keyboard. After each ideal attribute, participants were asked to indicate the extent to which they *ideally* would like to possess the attribute they listed, followed by the extent to which they *actually* possessed the attribute. Rating scales were presented beneath each question and participants responded by pressing a number from 1 (*slightly*) to 4 (*extremely*). Similarly, after each ought attribute, participants were asked to indicate the extent to which they felt they *ought* to possess the attribute, followed by the extent to which they *actually* possessed the attribute on the same 4-point scales.

While completing the measure, participants' reaction times (RTs) for producing each attribute, and for making the two ratings that followed, were recorded by the computer. After log transforming all of the RTs in order to reduce skew (see Judd & McClelland, 1989), the total strength of participants' promotion concerns was calculated by summing all of the RTs for the ideal attributes, and the total strength of participants' prevention concerns was calculated by summing all of the RTs for the ought attributes. Finally, both of these indices were reverse scored (multiplied by -1) so that higher scores represented faster responses (i.e., shorter response latencies) and greater strength. Because people's reaction times vary in general (i.e., overall, some people tend to respond faster than others), the promotion strength and prevention strength indices derived from this measure can be used meaningfully only when the common variance between the two indices is eliminated (e.g., in a simultaneous regression analysis or by computing a difference score).

## RESULTS

Six participants were eliminated for failure to follow instructions or for incomplete materials. An additional two participants were eliminated for responses that were more than two standard deviations (*SD*) from the mean. Inclusion of these participants did not alter the significance of the results reported below. This left the responses of 92 participants for analysis.

Two independent raters coded participants' impressions of the vague and ambiguous targets in the same manner as in Study 1a. Agreement was again high ( $\alpha = .90$ ) and discrepancies were resolved by discussion. Preliminary analyses of the contents of participants' impressions were virtually identical to those reported above and in the Appendix. These

analyses confirmed that for this sample, (a) the target vignettes again created the appropriate vague or ambiguous uncertainty, and (b) participants' chronic promotion or prevention concerns were not associated with any content differences in the categories they listed.

The primary hypotheses for this study were the same as in Study 1a. Participants with stronger chronic promotion concerns were expected to list a greater number of categories for the vague targets than participants with stronger chronic prevention concerns, whereas participants with stronger chronic prevention concerns were expected to list a greater number of categories for the ambiguous targets than participants with stronger chronic promotion concerns. As before, analyses of the number of categories participants listed should then reveal a significant predominant concerns  $\times$  target uncertainty interaction. To test this, participants' prevention strength scores were first subtracted from their promotion strength scores to create an index of their predominant concerns. More positive values on this index indicate stronger predominant promotion concerns, and more negative values indicate stronger predominant prevention concerns. The number of categories participants generated was then hierarchically regressed on the predominant concerns index, a dummy-coded variable representing the type of target (i.e., vague or ambiguous), and a term representing the interaction between them.

Predicted values calculated from the final regression equation at 1.5 *SD* above and below the mean of the predominant concerns measure illustrate that for the vague target, predominant promotion concerns were associated with listing more categories ( $Y = 2.4$ ) than were predominant prevention concerns ( $Y = 1.4$ ). However, for the ambiguous target, predominant prevention concerns were associated with listing more categories ( $Y = 3.1$ ) than were predominant promotion concerns ( $Y = 2.0$ ). These results reflected two separate effects. First, there was a main effect of the type of target such that participants listed more categories overall for the ambiguous target than for the vague target ( $\beta = .25$ ,  $t(87) = 2.34$ ,  $p < .05$ ). However, more importantly, this main effect was also qualified by the predicted predominant concerns  $\times$  type of target interaction ( $\beta = -.32$ ,  $t(84) = 2.44$ ,  $p < .05$ ).

## DISCUSSION

The results of Study 1b replicated Study 1a and further support our hypotheses concerning the effects of eager or vigilant motivated decision strategies and vague and ambiguous types of uncertainty on the number of categories people apply to social targets. The stronger people's chronic predominant promotion concerns were, the more categories they listed for a vague target and the fewer categories they listed for an ambiguous target, whereas the stronger people's chronic predominant



prevention concerns were, the fewer categories they listed for a vague target and the more categories they selected for an ambiguous target. This provides convergent evidence for the results of the previous study and strengthens the conclusion that these results are driven by the motivated strategies associated with either chronic or temporarily induced promotion concerns and prevention concerns.

Some limitations to the findings of both Studies 1a and 1b need to be considered, however. First, the free-response measure used in these studies directly assessed the categories that participants chose to accept for the target, but it did not directly assess the categories that participants chose to eliminate. This is not a great concern in the vague conditions where the interpretive challenge in resolving the uncertainty primarily involved deciding whether or not to accept a variety of categories in the face of weak evidence. A free-response measure directly captures these decisions. However, this measure creates some uncertainty in the ambiguous conditions where the interpretive challenge primarily involved deciding whether or not to eliminate one or more categories in the face of strong evidence. Free responses only indirectly capture these decisions.

Another problem with the free-response measure in the ambiguous conditions was that participants did not limit their responses to the central categories that were creating the ambiguity. Indeed, although those primed with promotion concerns did consider fewer categories for ambiguous targets than those primed with prevention concerns, they still generated, on average, between two and three categories in this condition rather than a single category as was predicted. Content analyses for responses to the ambiguous targets suggested that this was largely because participants included some categories in their descriptions that were related to the other peripheral portions of the vignettes rather than to the central ambiguous behaviors (see Appendix). This too clouds the interpretation of the results for the ambiguous targets.

A better measure for assessing the effects of promotion or prevention strategic preferences on the categorization of ambiguous targets, then, would be to have participants rate the likelihood that a target belongs to each of two strong, but conflicting, categories. By examining the absolute difference between these ratings, it would be possible to determine the extent to which people are selecting both alternatives to an equal degree (resulting in a relatively small difference) or elevating one alternative and eliminating the other (resulting in a relatively large difference). Therefore, this type of measure was employed in Study 2, which was conducted to clarify the effects of eager versus vigilant decision strategies on the categorization of ambiguous stimuli.

## STUDY 2

### METHOD

#### Participants

Participants were 51 Columbia University students (26 men and 25 women) who were paid \$5 for volunteering for the study. Gender had no significant effects. All participants indicated that English was their native language.

#### Procedure

The procedure for Study 2 was similar to those of the two previous studies. Participants began by completing the same chronic promotion and prevention strength measure as in Study 1b. After this, they were told that they had finished "Experiment 1" and that they would now move on to the next study. At this point, they were asked to categorize an ambiguous target. Finally, participants again completed additional individual difference measures not directly relevant to the present study.<sup>5</sup>

#### Materials

*Categorization Task.* The stimulus used for the categorization task in this study was analogous to those used in Studies 1a and 1b. This stimulus was again presented in the form of a vignette describing the behavior of a target person through the narration of an observer. In the interest of generality, the vignette differed from those used in the previous studies and was adapted from Higgins and Brendl (1995).

As before, ambiguous uncertainty was created by describing the target's behaviors in a way that clearly indicated two equally plausible, but conflicting, alternatives. A portion of this vignette read (for the full text, see Appendix):

...[Professor Jones] stopped to talk to us and mentioned how high the quality of Sue's recent paper was. She told him that she knew this and that her papers were always better than her classmates'. In fact, as long as I have known Sue, her papers have always been outstanding...

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5. Need for cognition and need for closure measures were again included, and all analyses were performed using these measures as covariates. Participants' scores on the predominant concerns measure were uncorrelated with both of these measures ( $r_s < .03$ ). No independent effects were found involving the need for cognition, but some independent effects involving the need for closure are described in a later footnote. All means and degrees of freedom reported have once again been adjusted.

The two conflicting categorizations that are indicated are *conceited* and *self-confident*, each of which is strongly supported by Sue's behaviors. Once again, the conflict that exists is primarily an evaluative one, and, again, previous research has shown that when presented with this behavioral description, most people choose one of the two options instead of retaining both (Higgins & Brendl, 1995; Higgins et al., 1977). Participants' categorization decisions were measured by having them answer, "How self-confident do you think Sue is?" and "How conceited do you think Sue is?" on separate 1-9 scales ranging from *not at all* to *extremely*. The order in which these scales were presented was counterbalanced and was included as a separate factor in all analyses.

## RESULTS

Four participants were eliminated for either failing to follow instructions or for incomplete materials. An additional two participants were eliminated for responses that were more than two standard deviations from the mean. Inclusion of these participants did not alter the significance of the results reported below. This left the responses of 45 participants for analysis. There were no effects for the order in which participants rated each category, and this variable was dropped from all analyses.

Preliminary analyses examined participants' ratings of each of the two possible categories to ensure that the vignette was perceived as ambiguous. Mean ratings for all participants illustrated that people rated the target as both highly self-confident and highly conceited ( $M = 7.1$ ,  $SE = .27$  and  $M = 7.6$ ,  $SE = .25$ , respectively),  $F(1, 44) = 2.67$ ,  $p = n.s.$ . This confirms that the evidence provided in the vignette was indeed strong, but conflicting, and created the intended ambiguous uncertainty. Furthermore, participants' chronic promotion concerns or prevention concerns were not related to their absolute ratings of the target as either conceited or self-confident (all  $F_s < 1.7$ ). Thus, as in Studies 1a and 1b, participants' motivational orientations did not have any content effects.

As in previous studies, the primary hypotheses were that, given ambiguous evidence, individuals with predominant promotion concerns would be more likely to select a single category and eliminate the alternative, whereas individuals with predominant prevention concerns would be more likely to refrain from eliminating either alternative. Therefore, on average, those with promotion concerns would be expected to elevate their ratings of one category (either self-confident or conceited) over the alternative, and show a greater absolute difference between these ratings. In contrast, those with prevention concerns

would be expected to rate both of these categories more equally and show a smaller absolute difference between these ratings.

To test this hypothesis, the absolute difference between participants' category ratings was regressed on an index of their predominant promotion versus prevention concerns, which was calculated in the same manner as in Study 1b. Figure 2 displays the predicted values calculated from this equation at 1.5 *SD* above and below the mean of the predominant concerns measure. These values illustrate that, as predicted, participants with predominant promotion concerns showed a greater difference between their ratings than participants with predominant prevention concerns ( $\beta = -.27, t(41) = 1.96, p < .06$ ).<sup>6</sup>

## DISCUSSION

The results of Study 2 clarify the results found in Studies 1a and 1b concerning the effects of eager or vigilant decision strategies on the number of categories people apply to ambiguous targets. The stronger people's chronic predominant promotion concerns were, the greater was the absolute difference between their category ratings. This indicates that, as expected, individuals with greater promotion concerns were more likely to endorse a single category and eliminate the other possibility, which is consistent with an eager decision strategy focused on pursuing opportunities to identify correct categories. In contrast, the stronger people's chronic predominant prevention concerns were, the smaller was the absolute difference between their category ratings. This indicates that, again as expected, individuals with greater prevention concerns were more likely to endorse both categories and not eliminate any of the possibilities, which is consistent with a vigilant decision strategy focused on avoiding commitment to incorrect categories.

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6. In addition to the regulatory focus effect, a near significant effect for participants' need for closure was also found. The need for closure represents people's desire to seek a clear answer, any answer, when faced with uncertainty (Kruglanski & Webster, 1996). Analyses revealed that as participants' need for closure increased (controlling for their need for cognition, and predominant concerns), the absolute difference between their category ratings also increased ( $\beta = .31, t(41) = 1.97, p < .06$ ). These results are consistent with what one would predict from need for closure theory. When faced with an ambiguous target, individuals with a high need for closure should want to derive a clear answer and reduce the ambiguity by selecting one possibility and eliminating the other (see Kruglanski & Webster, 1996), thereby increasing the difference of the trait category ratings. There was no significant interaction between participants' need for closure and their predominant promotion versus prevention concerns in the difference between their category ratings.

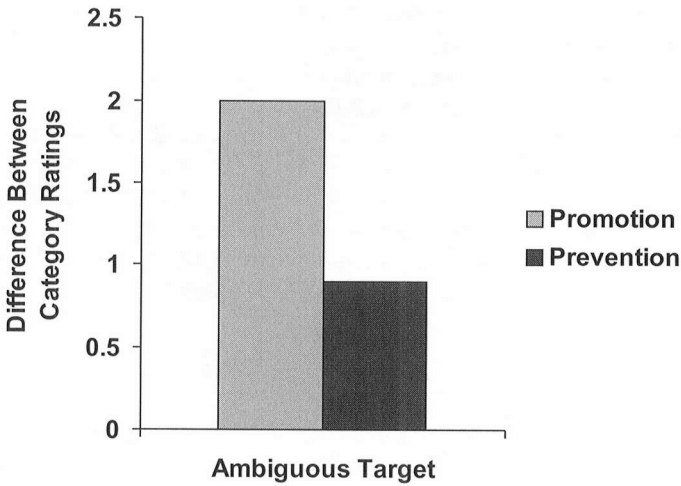


FIGURE 2. Absolute difference between *self-confident* and *conceited* category-membership ratings for an ambiguous target given by participants with chronic promotion versus prevention concerns.

## GENERAL DISCUSSION

The general objective of the research presented here was to investigate the influence of two different factors on the number of categories perceivers apply to uncertain social targets and behaviors. The first factor was the different interpretive challenges created by different types of uncertain targets, and the second factor was people's preferred strategies for approaching these interpretive challenges. Overall, the results of the studies described here showed that for vague targets, where the challenge was to decide which alternatives to accept in the presence of generally weak evidence, the eager decision strategy favored by people with promotion concerns produced a tendency to consider more possible categories than did the vigilant decision strategy favored by people with prevention concerns. In contrast, for ambiguous targets, where the challenge was to decide which categories to eliminate in the presence of generally strong, but conflicting, evidence, the vigilant decision strategy favored by people with prevention concerns produced a tendency to consider more possible categories than did the eager decision strategy favored by people with promotion concerns. Moreover, these results were generally robust and were found regardless of whether people's

promotion or prevention concerns were measured versus manipulated or whether their categorizations were assessed using a free-response format versus category membership rating scales.

What is the potential importance of these results for the study of social categorization? As mentioned earlier, understanding how people categorize individuals or behaviors in the face of uncertainty is important because such categorizations can become the basis for later evaluations of these individuals or behaviors (Bodenhausen et al., 1999; Trope, 1986). As also mentioned earlier, whether perceivers choose few or many alternatives when making their categorizations can profoundly affect these evaluations (e.g., Anderson, 1991; Fiske & Neuberg, 1990; Malt et al., 1995).

One area of research that has repeatedly illustrated this is the study of social stereotyping. Work on stereotyping research (see Bodenhausen et al., 1999; Fiske & Neuberg, 1990; Macrae & Bodenhausen, 2000) has repeatedly examined how categorizing another person in terms of a single stereotypical category (e.g., African American) versus several more diverse categories (e.g., an intelligent, idealistic, reserved, African American) can profoundly influence the additional inferences that are formed about this person (see Bodenhausen et al., 1999; Fiske & Neuberg, 1990; Macrae & Bodenhausen, 2000). The findings that have emerged typically show that perceivers who select a single dominant category for a target person often draw more far-reaching inferences and generalizations based on this category, whereas perceivers who consider a greater number of categories draw fewer and more constrained inferences (see also Ford & Kruglanski, 1995; Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994; cf. Kelley, 1973).

Similar findings have also been reported in the broader categorization literature. Murphy, Ross, and colleagues have demonstrated that when asked to make inferences about targets that can be categorized in multiple ways, people often confidently focus on a single dominant category and ignore the other alternatives (Malt et al., 1995). Murphy et al. have also demonstrated, however, that in circumstances where the selection of a dominant category is hindered in some way and people are forced to continue to mull over different alternatives, their inferences are less confident and reflect these alternatives to a greater degree (Murphy & Ross, 1994; Ross & Murphy, 1996).

The studies presented here show that perceivers' motivation to employ certain decision strategies affects whether they tend to resolve different types of uncertain targets and behaviors using a single dominant category or whether they consider, and continue to mull over, a number of alternate categories. This strategic motivation, then, could potentially determine whether categorical inferences are increased or attenuated, respectively (cf. Liberman, et al., 2001). In addition, the studies pre-

sented here also demonstrate that the effects of perceivers' strategic motivation on categorization depend on the type of uncertainty created by a target. Therefore, promotion concerns and eager decision strategies should reduce categorical inferences when perceivers are considering targets that create vague uncertainty. In contrast, prevention concerns and vigilant decision strategies should reduce categorical inferences when perceivers are considering targets that create ambiguous uncertainty. This could be an important topic for future research on how categorical inferences can exacerbate or attenuate social stereotyping, as well as on categorical inference processes in general.

Beyond these implications for categorical inference, the studies presented here have broader implications as well. First, the findings described above illustrate the general importance of being precise about different types of uncertainty that arise during information processing (see Higgins, 1996; Wallsten, 1990). In the present circumstances, distinguishing between ambiguous and vague forms of uncertainty allowed a more thorough understanding of people's categorization decisions. Given the number of areas in cognitive science where the study of uncertainty is paramount (e.g., knowledge activation, choice behavior, decision making, and reasoning), an increased pursuit of distinctions between these and other types of uncertainty in such areas could potentially lead to greater understanding of many other cognitive processes as well.

In addition, the studies presented here illustrate once again the benefits of approaching cognitive phenomena from a perspective that simultaneously encompasses both cognitive and motivational principles (see, e.g., Dunning, 1999; Kunda, 1990). Throughout much of the early research on social cognition, motivational and cognitive approaches were perceived as embodying separate sets of principles for explaining behavior (see, e.g., Tetlock & Levi, 1982). In contrast to this view, more recent conceptions of the relation between motivational and cognitive processes often posit mutual interaction or synergism (Sorrentino & Higgins, 1986). Such synergistic approaches allow for the identification of new principles that are uniquely associated with a *motivation-cognition interface* (Kruglanski, 1996), and, as these and many other studies demonstrate (for reviews, see Kunda, 1990; Molden & Higgins, in press), they potentially provide more nuanced and refined perspectives on the basic mechanisms involved in judgment and decision making.

Finally, beyond merely representing another example of recent synergistic approaches, the studies presented here extend these approaches. Previous research has typically investigated the motivated cognitions that stem from people's preferences for certain outcomes during judgment (e.g., positive self-views or clear and concise answers; see Dunning, 1999; Kruglanski, 1996; Kunda, 1990). These studies instead

examined the motivated cognitions that stem from people's preferences for the use of certain strategies when forming their judgments. At no time in the experiments described above would participants have been expected to have any clear outcome preferences or particular conclusions that they felt were especially desirable when categorizing the uncertain targets. Yet, measuring and manipulating preferences for eager versus vigilant judgment strategies nevertheless uncovered important motivational effects on this process. This research thus adds to the growing number of studies that are establishing the importance of a separate, but complementary, "strategic preference" approach to the study of the motivation-cognition interface (see Higgins & Molden, 2003; Molden, 2003; Molden & Higgins, in press). We hope that future research will continue to demonstrate the importance of such a strategic preferences approach and thereby further refine the field's understanding of basic judgment mechanisms.

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## APPENDIX

### CATEGORIZATION STIMULI: EXPERIMENT 1

All participants received the target person vignettes in the order in which they are presented. Italics indicate text that was present only in the *vague* target condition and brackets indicate text that was present only in the *ambiguous* target condition. Below each vignette, the three most common responses for the vague and the ambiguous conditions are listed, followed in parentheses by the total proportion of participants who included that response among their categorizations. Participants made their categorizations by answering the question, "What is your impression of [name of target person]?"

**Vignette 1: Rob**

Rob and I are roommates. One Saturday when the weather was nice, we decided to have lunch at an outdoor cafe. Our apartment was just a short walk away, and we had a pleasant stroll before being seated at a table in the sun. *Over lunch we began to talk about a short story that Rob had read. He told me that the literary review he had seen it in was one of his favorites. In all the time I have known Rob, he has enjoyed literature, although he has not really decided whether or not he wants to pursue it as a career.* [Over lunch we began to talk about a short story that Rob had written. He told me that the literary review he had submitted it to had rejected it, but that he thought that the story was good and that he was going to re-submit it anyway. In all the time I have known Rob, once he makes up his mind to do something, it's as good as done no matter how long it might take or how difficult the going might be. Only occasionally does he change his mind even when it might well have been better if he did.] After finishing lunch, we still wanted to be outside so we headed over to the park and threw a Frisbee around for a little while before finally going home.

Vague categorizations: Uncertain (27%), Literary (23%),  
Easy-going (20%).

Ambiguous categorizations: Persistent (29%), Stubborn (17%),  
Persistent/Stubborn (34%).

**Vignette 2: Jason**

One day, Jason and I were talking on our way out of a class we have together and got into a philosophical discussion. Jason was explaining how he has his own ideas about how people should live. *He feels that the world can be a much better place, but he's not sure whether or not this will ever happen. He believes that problems like hunger and crime should be controlled, but is not sure what steps can be taken to do so.* [He feels that the world can be a much better place to live if everyone practices transcendental meditation. He envisions a world without hunger, poverty, or crime. He believes that once such a world is established, all political leaders can then step down from their posts and all people, regardless of age, race, or nationality, will live in harmony together.] Jason had a lot to say, and I ended up mostly listening and didn't offer much of a response.

Vague categorizations: "A talker" (30%), Deep-thinker (20%),  
"Feels powerless" (20%).

Ambiguous categorizations: Idealistic (19%), Unrealistic (11%)  
Idealistic/Unrealistic (38%).

**Vignette 3: Scott**

Recently, I called my friend Scott and said I had an extra ticket for a concert that evening. I knew that Scott liked the band that was playing, so I thought that he might like to come along. *He asked me what time the show started and I said 9:00. Scott said that he didn't think that he wanted to go. He sometimes gets really involved with something he's doing and doesn't want to stop. I can never seem to read his moods or figure out when he wants to be social and when he wants to be left alone.* [He asked me how much the tickets cost, and I told him they were \$20. Scott said that he didn't think that he wanted to go. He is always trying to save money. He uses coupons, buys things on sale, and avoids donating money to charity or lending it to friends.] I talked to him for a couple more minutes to see if he would change his mind, but eventually I told him that I'd see him later and got someone else to go with me.

Vague categorizations: Moody (30%), Self-centered (17%), Introvert (17%).

Ambiguous categorizations: Thrifty (26%), Stingy (29%), Thrifty/Stingy (31%).

**Vignette 4: John**

Last Christmas vacation, I ran into one of my classmates from high school, John. We started reminiscing and getting caught up on what each of us had been doing. *As we were talking, I was reminded that John has lots of interests, but that most of them are different than mine. Even though we speak fairly often, he really has a core group of friends that I don't talk to very much. In fact, the only time I really see him anymore is when we sometimes get together to play basketball.* [As we were talking, I was reminded that John has his own standards of behaving. As a student, he would tell on fellow classmates when he saw them break school rules, like cheating on tests. In fact, he used to claim that never once in his life had he thought about cheating.] After a little while, I said goodbye and continued with my shopping.

Vague categorizations: Nice (32%), Friendly (23%), "No impression" (22%).

Ambiguous categorizations: Honest (40%), Snitch (24%), Honest/Snitch (16%).

**CATEGORIZATION STIMULUS: EXPERIMENT 2**

Participants made their categorizations of the target by answering the questions "How self-confident do you think Sue is?" and "How con-

ceited do you think Sue is?" on 1-9 scales ranging from *not at all* to *extremely*. The order in which participants answered these questions was counterbalanced.

Sue and I are college students at Columbia. One day we arranged to meet in front of Low Library. It was very sunny that morning when I walked slowly up to the library. I could recognize Sue from far away because I saw her blue jacket. We decided to go to a nearby cafe since both of us like pastries a lot. Then I was quite surprised to see Professor Jones, our political science professor, approaching us on our way to the cafe. He stopped to talk to us and mentioned how high the quality of Sue's recent paper was. She told him that she knew this and that her papers were always better than her classmates'. In fact, as long as I have known Sue, her papers have always been outstanding. Finally, we went to the cafe where we had a good time, a much better time than I am having right now day-dreaming in Professor Jones' class.