Psychological-State Theories About Significant Others: Implications for the Content and Structure of Significant-Other Representations

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Three studies tested a theory-based approach to significant-other representations. The central hypothesis was that perceivers are especially likely to possess lay theories to explain the responses of their significant others, and this is reflected in the content and structure of significant-other representations. Theories were defined in IF-THEN terms as beliefs about the psychological states (e.g., "IF Bill wants to make a good impression . . . ") that explain others' responses (e.g., " . . . THEN he acts friendly"). All three studies yielded evidence indicating that the content of significant-other representations is especially likely to include such psychological-state theories (PSTs). Study 3 assessed the internal structure of PSTs—specifically, the strength of the linkages between psychological-state IFs and the THENs they are believed to elicit—and showed that such linkages are particularly strong for PSTs about significant others. Overall, the findings add to the growing literature on the role of explanatory or lay-theoretical forms of knowledge in how perceivers make sense of the social world.

Keywords: *significant others; theories; mental representation; if-then relations*

Because significant others are often the targets of social cognition, it is important to ask how the nature of knowledge about these individuals might differ from social knowledge in general. Is Amy's conception of her best friend, Sandy, limited to featural characteristics such as kind and outgoing? Or does Amy also possess lay theories to explain Sandy's responses—for example, Sandy is kind because she values kindness or Sandy is outgoing because she likes to have fun. In the present research, a theory-based approach to significant-other representations is proposed. Its central claim is that perceivers are especially likely to make sense of their significant others in terms of lay theories. This argument is grounded in cognitive, developmental, and social-cognitive work, which suggest that perceivers conceptualize objects and people not simply in terms of features or attributes but also in terms of explanatory, theory-based knowledge (e.g., Gopnik & Wellman, 1994; Keil, 1989; Murphy & Medin, 1985; Sedikides & Anderson, 1994).

A THEORY-BASED APPROACH TO SIGNIFICANT-OTHER REPRESENTATIONS

In developing a concrete definition for lay theories, the proposed theory-based approach draws in part from Mischel and Shoda's (1995) cognitive-affective processing system (CAPS) theory. Countering longstanding views of personality as trait-based and cross-situationally consistent, this theory argues that IF-THEN relations are the basic units of personality. IFs refer to the objective situations people encounter (e.g., "IF at work . . . ") and THENs refer to their responses in them (e.g., " . . . THEN I am aggressive). Objective situations are thought to activate cognitive-affective units (e.g., feelings, goals, expectancies), which are seen as the psychological mediators of IF-THEN relations. In the realm of person perception, the CAPS theory suggests that perceivers may view others in terms of such IF-THEN relations (Shoda & Mischel, 1993). The present approach extends this idea

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by proposing that, at times, knowledge about the IF-THENs of others represents lay theories—that is, IFs may serve expressly as explanations for THENs.

IF-THENs as Lay Theories

What kind of IF-THEN can be considered a theory? Because knowing the objective situations (e.g., work, school) in which someone exhibits particular responses often results from simply having observed that person in those situations, such IF-THENs do not seem especially theoretical or explanatory in nature. At times, however, perceivers may go beyond merely noting someone's responses in objective situations to inferring the psychological situations or states (e.g., thoughts, feelings, goals) that elicited those responses. In the present studies, IF-THENs in which the IFs refer to the psychological states that produce others' responses (i.e., THENs) were deemed theories because figuring out the inner workings that underlie someone's responses entails inferring, essentially, the most proximal causes of these responses (e.g., "IF Angelina feels insecure, THEN she doesn't talk much"). In this sense, knowledge about the psychological-state IFs of someone's THENs carries distinct explanatory power. Said differently, such psychological-state theories (PSTs) reflect conceiving of someone's IFs not in terms of the objective situations that, according to Mischel and Shoda (1995), activate psychological mediating variables but rather directly in terms of the psychological mediators linking objective IFs and THENs (see Figure 1).

An overarching aim of the present research was to establish that social knowledge may take the form of not only features or attributes but also explanatory, IF-THEN units of knowledge, each composed of a psychological-state IF that provides a proximal explanation for the THEN. In short, psychological-state theories play a role in general social perception. A more specific goal was to test the hypothesis that perceivers are especially likely to conceive of significant others in terms of PSTs—that is, to view the IFs of significant others not simply in terms of objective situations such as "IF at a party, Angelina . . . " but also in terms of the psychological states of these individuals—for example, "IF Angelina feels insecure . . . ." In turn, it was hypothesized that this pronounced tendency to make sense of significant others in terms of PSTs would be reflected in both the content and structure of significant-other representations.

Constructing Lay Theories About the Social World

What evidence is there to suggest that perceivers construct lay theories about the social world at all? Historically speaking, social-cognition researchers have long recognized that perceivers possess lay theories (e.g., Asch, 1946; Bruner & Taguiri, 1954). However, this

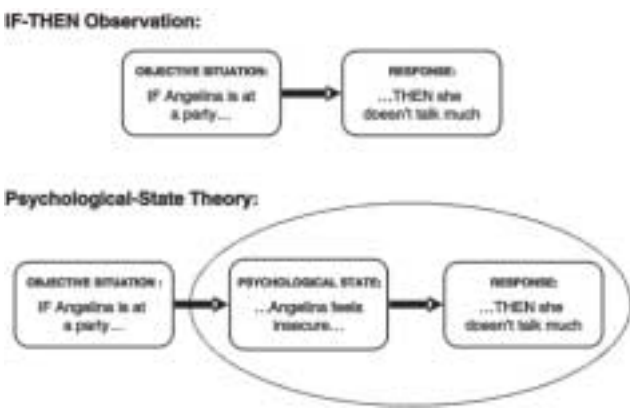

Figure 1 Examples of an IF-THEN observation and a psychological-state theory.

recognition has often remained on a conceptual level, with widely used empirical methods reflecting instead the assumption that features—typically in the form of trait attributes—are the main units of social knowledge (for a review, see Chen, 2001). Redressing this imbalance, the basic proposition that conceptions of others may include explanatory, theory-based forms of knowledge has received growing empirical attention in recent decades. For example, some have argued that one way people make sense of incongruent information about others is to impose a theory for why the incongruence exists (Asch & Zukier, 1984). People also integrate inconsistencies in their own experiences into internally coherent stories (Baumeister & Newman, 1994; see also Pennington & Hastie, 1992; Read & Miller, 1993). Another example is work on "person models," which suggests that impressions resemble narratives composed of a central concept with bits of information linked to it in consistent ways (Park, DeKray, & Kraus, 1994).

Recent work on implicit personality theories (IPTs) argues explicitly that perceivers think in explanatory terms about others in that IPTs or "person types" are seen as composed of causally linked traits (Sedikides & Anderson, 1994; see also Andersen & Klatzky, 1987; Anderson & Sedikides, 1991). Likewise, social-cognitive work on connectionist models proposes that mental models may contain interconnected pieces of knowledge about others' traits, goals, beliefs, and so forth, some of which are explanatory (e.g., Read, Vanman, & Miller, 1997). Reminiscent of Gestalt ideas, such models contend that people perceive others' characteristics as a configuration, with the aim of arriving at a coherent understanding of them.

Also relevant is work on analogy, which indicates that explanations are stored in memory (e.g., Read & Cesa, 1991). To illustrate, research has shown that retrieval of a previously generated explanation is facilitated when people are faced with the task of explaining a new, unex-

pected event similar in causal structure to the one for which they originally constructed the explanation. Finally, research in the domain of stereotyping has shown that stereotype representations include "cause-effect" knowledge and that this knowledge influences stereotype-relevant information processing (e.g., Wittenbrink, Gist, & Hilton, 1997).

The emergence of such theory-based approaches in the social-cognitive literature was triggered in part by the rise of such perspectives in cognitive and developmental work (e.g., Gelman & Markman, 1986; Gopnik & Wellman, 1994; Keil, 1989; Murphy & Medin, 1985). Countering feature-based approaches to categories, which treat features or attributes as the unrelated building blocks of categories, theory-based approaches in these realms have argued that explanatory relations among category features exist (e.g., Medin, 1989; Murphy & Medin, 1985; Rips, 1991). Although some advocate for treating such relations as types of features (e.g., Goldstone, 1994), others argue that such a resolution continues to imply that categories are grounded simply in features rather than also in the theoretical "mortar" binding the featural "bricks" of categories together (e.g., Armstrong, Gleitman, & Gleitman, 1983; Medin, Wattenmaker, & Hampson, 1987; see also Gentner, 1989; Markman & Gentner, 1993).

In sum, wide-ranging research suggests that conceptions of objects and people alike may include lay theories. Why, though, would perceivers be especially likely to have theories to explain significant others?

Explanatory Thinking About Significant Others

Outcome dependency is associated with effortful processing (Fiske & Neuberg, 1990). By definition, emotional and motivational outcomes are distinctly dependent on significant others, which suggests that perceivers are likely to exert considerable effort to "know" these individuals (e.g., Andersen, Glassman, & Gold, 1998). It stands to reason that such efforts include formulating explanations for the responses of significant others. In fact, research has shown that relationship partners engage in attributional thinking about each other (e.g., Fletcher, Fincham, Cramer, & Heron, 1987; Miller & Read, 1991) and that the types of attributions they make are linked to key relationship outcomes, such as satisfaction (Bradbury & Fincham, 1990). Moreover, the link between attribution type and satisfaction has been found both when attributions are solicited and when they are made spontaneously, suggesting that explanatory thinking about significant others may reflect either controlled or automatic processes (see Fletcher & Fincham, 1991).

Explanations about significant others also have been the focus of research showing attachment-related differences in how individuals tend to explain relationship events (Collins, 1996). These distinct tendencies are thought to be stored in memory as part of working models of self and others. More evidence for explanations about significant others comes from research showing that perceivers construct theories to maintain their "positive illusions" about significant others (e.g., Murray & Holmes, 1993). For example, when faced with a romantic partner's fault, perceivers formulate explanations that reconstrue the fault into a virtue, thus enabling them to "defuse the negativity" of the fault.

In sum, a diverse literature suggests that perceivers may engage in explanatory thinking about significant others. This implies that representations of significant others are likely to contain knowledge reflecting not only features but also explanatory relations between featural bits of knowledge—essentially, lay theories. But what evidence is there to suggest that such theories may involve inferences about the psychological states of significant others or that perceivers make psychological-state inferences at all?

Psychological-State Theories About Significant Others

The concept of "psychological-state theories" is viable only if perceivers actually infer the inner workings of others. Research suggests that they do. For example, developmental work suggests that children as young as 18 months old may infer others' desires and make predictions based on such psychological-state inferences (Repacholi & Gopnik, 1997). Kalish's (1998) work suggests that older children (i.e., age 5) are able to make still more sophisticated inferences about others' psychological states (e.g., intentions) when making predictions about whether others will adhere to social laws. As a final example, Ames (2001) has shown that inferences about the mental states of a target often mediate the relationship between observations of the target's overt behavior and impression judgments. Such findings suggest that inferences about mental states are common in everyday social perception.

Is there support for the notion that psychological-state inferences might be involved in explanation? Malle and his colleagues have proposed that the traditional dichotomy that classifies explanations as either "person" or "situation" causes is suitable for understanding how people explain unintentional behaviors but that for intentional behaviors, a more complex scheme involving three different modes of explanation is needed (e.g., Malle, 1999). One of these modes, termed "reason explanations," is of particular relevance to the present research. Reason explanations for an agent's behavior involve inferences about the mental, subjective states of the agent (e.g., his or her beliefs or desires). Thus, similar to the present approach, this work explicitly acknowl-

edges a role for inferences about others' internal states in explanations for their behaviors.

Why would perceivers be especially likely to infer psychological states to explain significant others? Research suggests that cognition about the self and significant others are similar (Aron, Aron, Tudor, & Nelson, 1991). For example, actor/observer differences are diminished, resulting in greater similarity in the attributions made for the self and other (Nisbett, Caputo, Legant, & Marecek, 1973; see also Sande, Goethals, & Radloff, 1988; Zuroff, 1982; cf. Taylor & Koivumaki, 1976). If cognitions about the self and significant others are similar, then their corresponding representations are likely to be similar. In fact, research has shown that significant-other and self representations are more similar than are significant-other and nonsignificant-other ones in terms of the distinctiveness of knowledge about private aspects (e.g., thoughts, feelings) relative to public aspects (e.g., behaviors) and in terms of the accessibility of knowledge about private aspects (Andersen et al., 1998). Such findings are important because, coupled with evidence that information about private aspects is seen as more informative than behavioral information and that this is especially true for the self compared to others (Andersen & Ross, 1984), they suggest that having knowledge about the psychological states of significant others might be seen as especially useful for "knowing" these individuals, just as one's own inner workings are thought to best reflect one's "true" self (Andersen & Ross, 1984; see also Johnson & Boyd, 1995).

Related to this, theory and research suggest that perceivers are likely to infer significant others' psychological states because of the distinct self-regulatory significance of these individuals (e.g., Baldwin, 1992; Downey & Feldman, 1996; Moretti & Higgins, 1999; for a review, see Andersen & Chen, 2002); that is, figuring out what significant others think, feel, and desire serves a self-regulatory function (Andersen et al., 1998). Consistent with this, several lines have research have shown that representations of significant others contain more knowledge about private states than do representations of others, such as nonsignificant others (Andersen et al., 1998; Prentice, 1990). For example, Idson and Mischel's (2001) research, which was derived directly from the CAPS model (Mischel & Shoda, 1995), examined open-ended descriptions of various targets and found that descriptions were more likely to include references to cognitive-affective units—such as feelings and beliefs—to the extent that the target was both familiar and important.

Although existing research suggests, then, that perceivers have an especially large pool of psychological-state knowledge available about significant others, no research has examined the potentially explanatory nature of this knowledge, bringing in the broader cognitive and social-cognitive literature on theory-based approaches. A general aim of the current studies was to demonstrate that psychological-state inferences may at times serve an expressly explanatory function. On a more specific level, it was hypothesized that perceivers are especially likely to draw on their psychological-state knowledge about significant others to explain the responses of these individuals because psychological states represent the most proximal causes (i.e., IFs) of responses (i.e., THENs) and, thus, are distinctly useful in making sense of others. In turn, it was hypothesized that the pronounced tendency to conceive of significant others in terms of PSTs should be reflected in both the content and structure of significant-other representations.

Overview of Studies

Three studies were conducted to test the proposed theory-based approach. As stated, psychological-state theories (PSTs) were defined as beliefs about the psychological states (IFs) that explain the responses (THENs) of others. In all studies, participants named a significant other, stereotype, and nonsignificant other idiographically, with the latter two serving as control conditions (as in, e.g., Andersen & Cole, 1990). Significant-other and stereotype representations are both considered categories used in social perception, but the former is an exemplar, or *n*-of-one category, whereas the latter designates a group or type of person. Including a nonsignificant other controlled for target significance while holding constant the exemplar nature of the representations. Studies 1 and 2 assessed the role of PSTs in the content of significant-other representations relative to the control representations, with the hypothesis that the former includes more.

As indicated, conceiving of others in terms of PSTs should influence not only representational content but also representation structure. Specifically, the greater the tendency to view others in these terms, the stronger the structural linkages should be between stored knowledge about psychological states and the responses they explain. Thus, it was hypothesized that PSTs about significant others should be represented in the form of especially tightly linked IF-THEN units. To test this, Study 3 assessed the ease with which participants retrieved knowledge about the psychological states of significant others to explain the responses of these individuals, with greater ease reflecting tighter IF-THEN linkages.

STUDY 1

In Study 1, participants described a significant other, stereotype, and nonsignificant other. To do so, they were given a list of sentence prompts for each target, with each prompt designating an objective situation, or IF

(e.g., "IF at a party . . . "). They completed each prompt if they knew the response, or THEN, of the target in the situation (e.g., " . . . THEN Amy talks to everyone"). These IF-THENs were taken as a measure of participants' observations of the targets' responses in various objective situations. In light of research showing that situation-specific descriptions of familiar versus less familiar others contain more information (Prentice, 1990; see also Zuroff, 1982), participants were expected to list more IF-THEN observations for their significant other relative to the control targets. The situations used in prior work were also objective ones such as "in class" or "with family" (Prentice, 1990, p. 383).

Next, participants were asked to provide an explanation for each IF-THEN observation they had listed if they had one. Explanations were then coded in terms of whether they referred to a psychological state. Explanations referring to psychological states were taken as a measure of psychological-state theories (PSTs) in that they reflected participants' inferences about the psychological states that produce the responses exhibited in objective situations. Put another way, they reflect what participants perceive to be the psychological mediators between objective situations (IFs) and the responses (THENs) that are observed in them (i.e., objective situations—psychological states—responses). In this regard, these psychological-state explanations represent participants' perceptions of the most proximal IFs of THENs. Participants were expected to list the most psychological-state explanations for their significant other, in line with the central hypothesis that making sense of significant others is particularly likely to involve PSTs.

Method

PARTICIPANTS

Twenty-eight undergraduates (19 women, 9 men) enrolled in an introductory psychology course participated in this study for course credit. Participants were run in small groups.

PROCEDURE

Participants signed up for a questionnaire study on how people describe others. In the questionnaire, they first named a significant other, stereotype, and nonsignificant other in counterbalanced order. A significant other was someone "who is very important to you and has been for many years (perhaps a parent, relative, or friend)." Participants provided the first name of the person and a label for their relationship (e.g., my brother). A stereotype was defined as a noun label that describes a certain type of person (e.g., "jock" or "professor" type). A nonsignificant other was someone "who you know of, but do not know well, and who is not particularly important to you." Participants named the person and labeled their relationship with him or her.

Listing IF-THEN observations. Next, for each target, participants were presented with a list of 13 sentence-prompts, designating various objective situations (IFs). These IFs referred to physical settings (e.g., "At a party . . . "), activity contexts (e.g., "In a competitive situation . . . "), and interpersonal events (e.g., "When praised for an accomplishment . . . "). Participants were told to complete each prompt with the target's response (THEN) in the designated situation. They were told to skip a prompt if they did not feel quite sure about the target's response. To minimize social-desirability concerns, participants were told that the study was concerned only with the knowledge they have and not whether they approved of the targets' responses. Participants provided THENs for the targets in the same order in which they named them.

As noted, the number of THENs provided for each target indexed the number of IF-THEN observations stored about each person or stereotype. The same prompts were used for all targets to control the nature of the objective situations considered. Moreover, this enabled a degree of control over the pool of IF-THEN observations that participants were faced with in the explanation listing task (see below).

Listing explanations. After the IF-THEN listing task, participants were asked whether they had an explanation for each IF-THEN observation they listed; that is, whether they had an answer to the question "Why?" for each one. If so, they were told to add a phrase beginning with the word *because* to reflect their explanation (e.g., "IF at a party, THEN Amy talks to everyone BECAUSE . . . "). Participants were told that they should provide an explanation only if they felt fairly sure about it and that they could list the same explanation more than once, all different explanations, or none at all if they did not feel sure about any.

Coding of explanations. A coding scheme was developed based on ones used previously for self- and other-descriptions (e.g., Andersen, 1984; Fiske & Cox, 1979; McGuire & Padawer-Singer, 1976; Park, 1986; Prentice, 1990) to assess whether explanations did or did not refer to a psychological state. Two blind, independent judges then classified each BECAUSE phrase as a (a) psychological-state, (b) non-psychological-state, or (c) other explanation. Psychological-state explanations referred to internal, psychological states such as a goal, feeling, or belief (e.g., " . . . because he wants to get ahead" or " . . . because she thinks others don't like her"). Non-psychological-state ones referred to a situation or situational norm (e.g., " . . . because he's in school" or " . . . because it's her job") or to a global person

descriptor in the form of a trait (e.g., " . . . because she is outgoing"), habit (e.g., " . . . because he works late"), or role (e.g., " . . . because she is a good business person"). Phrases coded as "other" did not reflect actual explanations and instead reiterated the THEN or indicated how the participant knew the THEN (e.g., "because I saw him do it yesterday").

As noted, the number of explanations referring to psychological states served as a measure of PSTs. These explanations designate the psychological states that participants believe explain the relation between objective situations (IFs) and the observed responses (THENs) of a given target in them. In essence, they designate the psychological-state rather than objective IFs of THENs.

Participants listed IF-THEN observations followed by explanations so that IF-THENs that were backed by an explanation could be distinguished from ones that were not. This order also enabled eliciting knowledge that was explicitly known to be explanatory in that participants listed BECAUSE phrases expressly as explanations. Finally, participants listed IF-THENs and explanations only if they felt fairly sure about them to help ensure that the results would reflect differences in knowledge retrieval versus generation.

Results and Discussion

There was no effect of the order in which participants named and described the targets for any of the main dependent measures, and order did not interact with target condition; thus, order is not discussed further.[1] Significant others were mainly family members (50%), friends (32%), and romantic partners (11%). Stereotypes included "redneck" and "doctor," with "nerd" being the most common (32%). Nonsignificant others were individuals such as a doorman or cashier, with friend of a friend as the most common (46%).

NUMBER OF IF-THEN OBSERVATIONS LISTED

A one-way ANOVA on the number of THENs listed for each target was significant, $F(2, 54) = 17.31$, $p < .01$. A planned contrast pitting the significant other against the control targets combined also was significant, $F(1, 27) = 15.13$, $p < .01$. As shown in Figure 2, participants provided more THENs in response to the objective IFs for their significant other ($M = 11.86$) than for their stereotype ($M = 10.64$) and nonsignificant other ($M = 8.29$). A pairwise comparison between the significant other and stereotype targets was reliable, $t(27) = 2.18$, $p < .05$, as was one between the significant-other and nonsignificant-other targets, $t(27) = 4.71$, $p < .01$. The control conditions also differed, $t(27) = 4.65$, $p < .01$.

As predicted, participants had more IF-THEN observations stored in memory about their significant others relative to the control targets. The difference between the significant-other and nonsignificant-other targets fits prior work showing that perceivers possess greater situation-specific knowledge about familiar versus less familiar others (e.g., Prentice, 1990). In addition, although not the focus of the present research, the finding that more IF-THEN observations were listed for the stereotype than the nonsignificant other suggests the need to broaden current views of stereotype content so as to encompass IF-THEN forms of knowledge. This notion is considered further in the General Discussion.

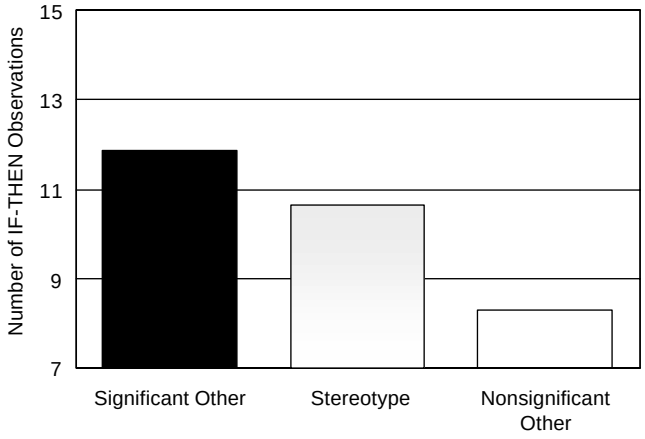

Figure 2 Study 1: Number of IF-THEN observations listed.

NUMBER OF EXPLANATIONS LISTED

Interjudge agreement in classifying BECAUSE phrases into one of the three explanation categories was 92.4%. Disagreements were resolved through discussion. Because the phrases coded as "other" did not actually reflect explanations, they were excluded from all analyses. It is worth noting that the number of these nonexplanations was low overall ($M = 0.34$) and a contrast comparing the number of them appearing in the significant-other versus the control conditions was not significant, $F < 1$.

Although explanations referring to psychological states were the main focus, if perceivers are generally more likely to engage in explanatory thinking about significant others, participants might be expected to list the most explanations of any kind for their significant other. To examine this, the proportion of IF-THEN observations listed that was backed by any explanation was computed for each target.[2] A planned contrast comparing the proportion for the significant-other target to the control proportions was reliable, $F(1, 27) = 4.56$, $p < .05$. Participants offered explanations for a greater proportion of the IF-THEN observations they listed about their significant other ($M = 0.83$) than their stereotype ($M = 0.72$) and nonsignificant other ($M = 0.70$) combined.

Although a comparison testing the difference between the significant-other and nonsignificant-other proportions was not reliable, $t(27) = 1.35$, *ns*, the difference in the proportions was in the expected direction. More important, additional pairwise comparisons showed that the significant-other proportion was reliably greater than the stereotype one, $t(27) = 2.38$, $p < .05$, and that the control proportions did not differ ($t < 1$). Regarding the latter, this finding suggests that although participants have more IF-THEN observations about their stereotypes than their nonsignificant others, they do not tend to explain observations about the former more so than the latter.

Although the difference between significant and nonsignificant others was not as strong as might have been expected, Study 1's key hypothesis pertained to explanations referring to psychological states. As argued, knowing the psychological state that elicits someone's response in an objective situation means knowing the most proximal cause of that response; that is, having a psychological-state theory (PST).

NUMBER OF EXPLANATIONS REFERRING TO PSYCHOLOGICAL STATES

To examine differences across targets in the number of PSTs participants possess, the proportion of IF-THEN observations backed by a psychological-state explanation was computed for each target. A planned contrast comparing the significant-other proportion to the two control proportions combined was reliable, $F(1, 27) = 21.36$, $p < .01$, indicating that participants had a PST to explain a greater proportion of their IF-THENs about their significant other ($M = 0.50$) than their stereotype ($M = 0.34$) and nonsignificant other ($M = 0.25$) combined (see Figure 3). Proportionately more PSTs were listed for the significant other relative to the stereotype, $t(27) = 2.84$, $p < .01$, and to the nonsignificant other, $t(27) = 3.89$, $p < .01$. The control conditions did not differ, $t(27) = 1.19$, *ns*.

One might argue that it is unsurprising that participants listed proportionately the most PSTs for their significant others because they tended to list more of all types of explanations for these individuals. This would imply, though, that participants also should have listed the most non-psychological-state explanations for their significant other. A one-way ANOVA on the proportion of IF-THENs backed by such explanations does not support this, $F(2, 54) = 2.24$, *ns*. Thus, the finding that perceivers had the most explanations for their significant other was due mainly to a pronounced tendency to have PSTs about these individuals.

Finally, explanations were examined in terms of the proportions of all phrases that were coded as psychological-state versus non-psychological-state ones.[3] Because analyses of these proportions would be redundant, a planned contrast was conducted only on the proportion of all explanations coded as psychological-state ones. To explain their IF-THEN observations, participants were more likely to call on psychological-state knowledge for their significant other ($M = 0.59$) relative to their stereotype ($M = 0.44$) and nonsignificant other ($M = 0.34$) combined, $F(1, 24) = 13.17$, $p < .01$. The proportion of psychological-state explanations was greater for the significant other than for the stereotype and nonsignificant other (ps $> .01$), whereas the control conditions did not differ, $t(24) = 1.20$, *ns*. Thus, as predicted, the majority of explanations listed for significant others reflected participants' beliefs about the inner, psychological workings of these individuals in different objective situations. For stereotypes and nonsignificant others, the majority of explanations reflected non-psychological-state knowledge.

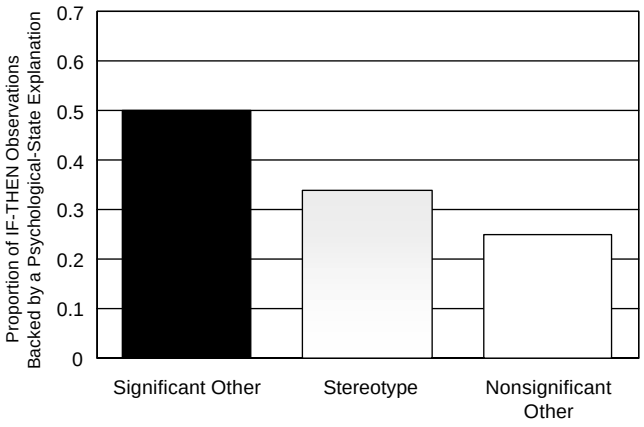

Figure 3 Study 1: Proportion of IF-THEN observations backed by a psychological-state explanation.

REDUNDANCY IN THE THENS AND EXPLANATIONS

Prior research has found less descriptive overlap across situation-specific descriptions of familiar versus less familiar others (Prentice, 1990). This finding suggests that less redundancy might be anticipated among the THENs listed for the significant other relative to the control targets, assuming that, on average, significant others are more familiar. To examine this, redundancy in the THENs listed for each target was coded by two blind, independent judges. Interjudge agreement was high at 99.4%; minimal disagreements were resolved through discussion. Redundancy was low overall ($M = 0.50$), and a one-way ANOVA examining target differences in the number of redundant THENs was not reliable ($F < 1$). Although this null effect does not fit Prentice's (1990) findings, her work compared familiar to unfamiliar others, a comparison that may not always parallel the difference between significant and

nonsignificant others. On the other hand, this finding enables ruling out the possibility that the target differences found for the number of IF-THEN observations listed were due to greater redundancy in the THENs listed for significant others.

Redundancy in explanations also was examined. As with the THENs, less redundancy might be expected in the explanations offered for the significant other relative to the control targets, a finding that would be compatible with the general argument that perceivers are especially likely to conceive of significant others in explanatory terms. Interjudge agreement in coding redundancy in the explanations was nearly perfect (99.7%), due partly to little redundancy overall (M = 0.81). A one-way ANOVA examining target differences in the number of redundant explanations was not significant ($F < 1$), and neither was an analysis examining redundancy in terms of the proportion of explanations that was redundant ($F < 2$). Although these null findings do not add to the earlier results showing the predicted pattern in the number of explanations participants have about their significant others versus the control targets, they do rule out the possibility that these earlier findings are due to greater redundancy in the explanations listed for the significant other.

EXAMINING POSSIBLE ALTERNATIVE ACCOUNTS

As indicated above, participants were instructed to list only THENs and explanations that they were fairly confident about as an attempt to tap knowledge retrieval rather than generation. However, one might argue that these instructions played a role in Study 1's results. Specifically, perhaps the situational-IF prompts that were used to elicit THENs were seen as so unconstrained that participants simply had more difficulty narrowing the many possible THENs down enough to be able to list THENs they were confident about for the control targets relative to the significant other. Said differently, perhaps participants listed more THENs for their significant others because their knowledge about them distinctly enables them to sift through the myriad of possible THENs to then decide on confident ones. The implication here is that the finding that participants listed the most THENs for their significant other might only hold for relatively unconstrained situations; for more constrained ones, the predicted target differences might be diminished because participants would be faced with fewer possible THENs to rule out before listing a confident one. To address this possibility, a separate sample of 29 participants was asked to rate how constrained each of Study 1's 13 situations is, with high-constraint situations defined as ones with only a few typical and plausible responses and low-constraint situations as those with many typical and plausible responses. Ratings were made on a 9-point, Likert-type scale (1 = *not at all constrained*, 9 = *very constrained*).

The seven situations with the lowest average ratings were then classified as relatively low-constraint situations (M = 3.41), and the remaining six situations were classified as high-constraint situations (M = 5.94). The number of IF-THEN observations listed for each target was then recalculated separately for low- and high-constraint situations. The planned contrast pitting the significant-other target against the control targets combined was significant for the low-constraint situations, $F(1, 27) = 11.84$, $p < .01$, as well as for the high-constraint ones, $F(1, 27) = 14.22$, $p < .01$. Thus, regardless of how constrained or unconstrained the situation, participants listed significantly more THENs for their significant other (low constraint, M = 6.57; high constraint, M = 5.32) than for the control targets combined (low constraint, M = 5.29; high constraint, M = 4.18). These results do not support the argument that participants listed fewer THENs for the control targets because, in light of the unconstrained nature of the situational-IF prompts, coupled with the listing-task instructions, they were less able to decide on THENs that they were confident about for these targets. Instead, these analyses support the interpretation that perceivers have more IF-THEN observations stored about their significant others than the control targets.

On a different but related note, one might argue that the THENs listed for significant others might have been especially specific in nature and it is this extra specificity that made it especially likely for participants to list explanations for the IF-THENs of their significant others; that is, greater specificity in the IF-THENs might be associated with fewer competing explanations, making it easier to decide on a confident explanation. If this were correct, it would suggest that Study 1's explanation results actually reflect target differences in the nature of IF-THENs rather than in the number of explanations per se. To examine this possibility, two independent judges rated the specificity of the IF-THENs listed by Study 1's participants using a 5-point, Likert-type scale (1 = *not at all specific*, 5 = *very specific*). Specific responses referred to explicit, precise, and umambiguous information (e.g., "On the job, Alicia makes sure everything is done neatly and on time"), whereas less specific responses did not (e.g., "On the job, Alicia works hard"). Because correlations between judges' ratings were generally high (significant other, r = .75; stereotype, r = .78; nonsignificant other, r = .75), the two sets of ratings were averaged for each target and then these averages were examined in a one-way ANOVA. The target effect was not reliable ($F < 1$), indicating that the specificity of participants' IF-THEN observations was comparable for the significant other (M = 2.89), stereotype (M = 3.01), and nonsignificant other (M = 2.95). This finding argues

against the notion that it was extra specificity in the IF-THENs of the significant other, which facilitated the listing of confident explanations for this target, that accounts for the predicted target differences found for the number of explanations listed.[4]

In sum, consistent with theory-based approaches, Study 1's results demonstrate that perceivers do indeed possess explicitly explanatory forms of knowledge about others and that some of this knowledge takes the form of PSTs. Moreover, they support the central hypothesis that the content of significant-other representations is especially likely to include PSTs.

STUDY 2

Although efforts were taken to rule out alternative accounts for Study 1's results involving the listing-task instructions, Study 2 was conducted to conceptually replicate Study 1 using different instructions. Specifically, Study 2's participants were not asked to list only THENs and explanations they were confident about; instead, they listed THENs for all of the situational-IF prompts and explanations for every IF-THEN they had just listed. Then, to tap differences in the tendency to conceive of the targets in terms of IF-THEN observations and explanations, participants were asked to make confidence and length-of-knowledge ratings for each of the IF-THENs and explanations they listed. Finally, Study 2 included several items pertaining to the self-regulatory significance of each of the targets as an effort to bolster the assumption that conceptions of significant others are distinct in part because of their distinctly high self-regulatory significance.

Method

PARTICIPANTS

Fifty-one undergraduates (31 women, 20 men) enrolled in various psychology courses participated in this study for course credit. Participants were run in small groups.

PROCEDURE

As in Study 1, participants signed up for a study about describing others. Upon arrival, they were told that they would be filling out four questionnaires and that each involved the same three targets. The order of the tasks involving the targets was counterbalanced in all questionnaires, with participants receiving different orders in different questionnaires. The procedures for the first questionnaire were almost the same as those used for Study 1's questionnaire, except where noted. Thus, in this questionnaire, participants first named a significant other, stereotype, and nonsignificant other.

Listing IF-THEN observations. Next, for each target, participants were presented with the same list of 13 sentence-prompts designating various objective situations (IFs) used in Study 1. However, in Study 2, participants were told to complete all of the prompts with the target's most likely response (THEN). If unsure about a response, participants were told to indicate their best guess. Thus, unlike in Study 1, the number of IF-THENs participants listed did not vary across targets and, thus, could not be used to assess target differences in the amount of IF-THEN knowledge they have stored in memory.

Listing explanations. Participants then engaged in the same explanation listing task used in Study 1, except they were told to provide a BECAUSE phrase for every IF-THEN observation they had just listed. If unsure about an explanation, they were told to indicate their best guess. Again, the number of explanations did not vary across targets so this number did not provide a test of target differences in the amount of explanatory knowledge participants have stored in memory.

Confidence and length-of-knowledge ratings for IF-THEN observations. In the next questionnaire, participants were asked to make two sets of ratings for the IF-THEN observations they listed in the first questionnaire about each target. Namely, for each IF-THEN, they rated how confident they were that the response (THEN) they listed is the target's most likely one in that situation (IF) and about how long they have known the response. Ratings were made on 7-point, Likert-type scales (1 = *not at all confident*, 7 = *very confident*; 1 = *not at all long*, 7 = *very long*). Participants rated the IF-THENs for each target all at once and were told they could refer to their responses in the first questionnaire when doing so. Consistent with Study 1's finding showing the most IF-THENs listed for significant others, confidence and length-of-knowledge ratings were expected to be the highest for the IF-THENs listed about significant others.

Confidence and length-of-knowledge ratings for explanations. In the third questionnaire, for each explanation they had listed earlier, participants rated how confident they were that the explanation is the most likely one for the target's response and about how long they have known the explanation. Ratings were made on 7-point, Likert-type scales (1 = *not at all confident*, 7 = *very confident*; 1 = *not at all long*, 7 = *very long*). Again, participants rated the explanations they had listed for each target all at once and were told they could refer to the first questionnaire. In line with Study 1's finding that participants listed the most explanations of any kind for their significant other, as well as when the comparison involved psychological-state explanations, it was hypothesized that confidence and length-of-knowledge ratings would be

highest for explanations listed about significant others—both when they did and did not refer to psychological states.

Self-regulatory-significance ratings. The fourth questionnaire included four items tapping the self-regulatory significance of the targets. Specifically, participants rated how much they valued the beliefs and opinions of each target, how much each target influences their feelings and behaviors, how much they take each target into account when making decisions, and how much they encounter each target in their daily lives. Ratings were made on 7-point, Likert-type scales (1 = *not at all*, 7 = *very much*). Finally, participants responded to various demographic items and then were debriefed, thanked, and excused.

Results and Discussion

Similar to Study 1, significant others in Study 2 were mainly family members (47%), friends (39%), and romantic partners (12%). The modal stereotype was a "nerd" or "geek" (12%), and the most common nonsignificant other was a friend of a friend (33%). Three participants were excluded because of substantial missing data and two were excluded because their responses indicated they did not follow the instructions.

NUMBER OF PSYCHOLOGICAL-STATE AND NON-PSYCHOLOGICAL EXPLANATIONS

Using Study 1's coding scheme, two independent judges classified each of the BECAUSE phrases into one of the three explanation categories: (a) psychological-state, (b) non-psychological-state, or (c) other. Interjudge agreement was 89%, and disagreements were resolved by a third judge.

This study was designed so that the number of explanations summed to 13 for all targets, so analyses were not conducted on the sheer number of explanations listed in each category.[5] However, examining the number of psychological-state explanations listed provided another test of the central hypothesis that perceivers are especially likely to possess PSTs to explain their significant others. In strong support of this hypothesis, and conceptually replicating Study 1's results for psychological-state explanations, a planned contrast showed that participants listed significantly more psychological-state explanations for their significant other (M = 7.98) than for the stereotype (M = 6.17) and nonsignificant-other (M = 5.37) targets combined, $F(1, 45) = 9.21$, $p < .01$ (see Figure 4). Pairwise comparisons confirmed that the number of PSTs was significantly greater for the significant other than for each control target (ps < .01). The difference between the stereotype and nonsignificant-other targets was marginally significant, $t(45) = 1.83$, $p = .07$. In short, participants referred to psychological states to explain the majority of the IF-THEN observations they listed for their significant other but fewer than half of the IF-THENs listed for the control targets.

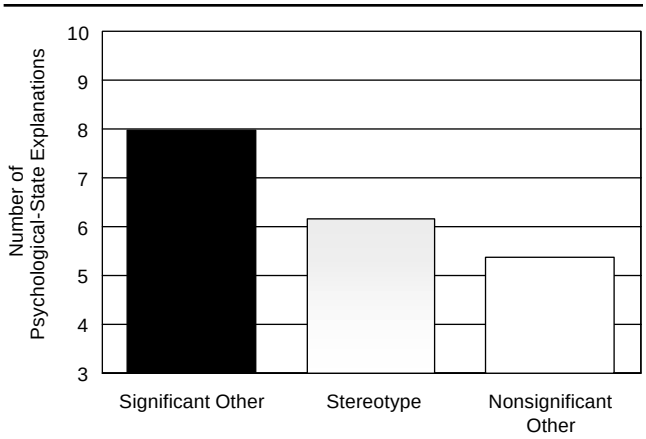

Figure 4 Study 2: Number of psychological-state explanations.

Given these clear differences in the number of psychological-state explanations, it is not surprising that parallel differences emerged for the other two explanation categories. Specifically, participants listed significantly fewer non-psychological-state explanations for their significant other (M = 4.44) relative to their stereotype (M = 5.11) and nonsignificant other (M = 5.96) combined, $F(1, 45) = 9.21$, $p < .01$, and were significantly less likely to provide an explanation classified as "other" for their significant other (M = .17) than for the control targets combined (M = .49), $F(1, 45) = 7.30$, $p < .05$. The fact that participants were the least likely to offer "other" explanations, which did not reflect true explanations (e.g., "because he told me so"), for their significant other is compatible with the hypothesis that perceivers are especially inclined to make sense of significant others in (truly) explanatory terms.

CONFIDENCE AND LENGTH-OF-KNOWLEDGE RATINGS FOR IF-THEN OBSERVATIONS AND EXPLANATIONS

As indicated, because participants were required to list IF-THEN observations for all 13 situational-IF prompts, and then explanations for all of these IF-THENs, this study is unable to directly replicate Study 1's findings in terms of the sheer amount of spontaneously listed IF-THENs and explanations. However, Study 2's participants were asked to make confidence and length-of-knowledge ratings for both forms of knowledge as another way to assess differences in the extent to which perceivers conceive of the targets in IF-THEN and explanatory terms. Conceptually replicating Study 1's finding of a greater number of IF-THEN observations listed for the significant other relative to the control targets, a planned contrast showed that participants were more confident that the THENs they listed about their

significant other ($M = 5.93$) were his or her most likely responses than the corresponding degree of confidence they reported for the THENs they listed about their stereotype ($M = 4.13$) and nonsignificant other ($M = 4.20$) combined, $F(1, 45) = 119.83$, $p < .01$. The control targets did not differ ($t < 1$). Similarly, participants indicated that they have held their knowledge of the responses of their significant others ($M = 5.60$) longer than their knowledge of the responses of the stereotype ($M = 3.83$) and nonsignificant other ($M = 3.01$) combined, $F(1, 45) = 107.09$, $p < .01$. The control conditions also differed, with longer-held knowledge about the THENs of stereotypes than of nonsignificant others, $t(45) = 2.88$, $p < .01$.

Parallel results emerged for the confidence and length-of-knowledge ratings participants made for their explanations.[6] Bolstering the pattern seen in Study 1 of more explanations in general listed for the significant other versus the control targets, a planned contrast showed that participants had higher confidence that the explanations they listed were the most likely ones for the IF-THEN observations of their significant others ($M = 5.88$) relative to stereotypes ($M = 4.38$) and nonsignificant others ($M = 4.33$) combined, $F(1, 41) = 109.79$, $p < .01$. The control targets did not differ ($t < 1$). For length-of-knowledge ratings, explanations for significant others ($M = 5.80$) were longer held than those for stereotypes ($M = 3.95$) and nonsignificant others ($M = 3.06$) combined, $F(1, 41) = 114.85$, $p < .01$. In addition, explanations about stereotypes were held reliably longer than those about nonsignificant others, $t(41) = 3.21$, $p < .01$.

Of importance, when these analyses were repeated for psychological-state and non-psychological-state explanations separately, virtually identical patterns of results were found, suggesting that participants were more confident about explanations referring to psychological states for their significant other relative to the control targets, just as was the case for non-psychological-state explanations. Likewise, both psychological-state and non-psychological-state explanatory knowledge were longest held for the significant other.

Overall, then, although participants were required to list IF-THENs and explanations in response to all of the situations, the predicted target differences emerged in terms of the confidence associated with these forms of knowledge, as well as the length of time they have been held. Together, these findings provide a strong conceptual replication of Study 1; both studies demonstrate that perceivers are especially likely to conceive of significant others in IF-THEN and explanatory terms. Of interest, participants reported having longer-held IF-THEN and explanatory knowledge about stereotypes than nonsignificant others, although confidence ratings did not differ. These findings are considered in the General Discussion.

REDUNDANCY IN THE THENS AND EXPLANATIONS

As in Study 1, redundancy in the THENs and explanations was examined. Arguably, examining redundancy is more critical in this study because of the requirement to list IF-THENs and explanations for every situation. Two independent judges coded for redundancy within each set of THENs and explanations listed for each target. Interjudge agreement was very high for both forms of knowledge (greater than 99%), due partly to the fact that there was little redundancy in the THENs ($M = 0.46$) and explanations ($M = 1.17$). For THENs, although the pattern of the means was consistent with the notion that perceivers have a broader IF-THEN knowledge base about significant others relative to the control targets (significant other, $M = 0.33$; stereotype, $M = 0.48$; nonsignificant other, $M = 0.50$), a one-way ANOVA examining target differences in the number of redundant THENs was not significant ($F < 2$). At first glance, the minimal redundancy seen overall and lack of target differences might suggest that perceivers possess fairly extensive IF-THEN knowledge about a wide range of targets. However, these findings need to be considered in light of the confidence and length-of-knowledge ratings, which clearly suggest that the IF-THENs listed for significant others were especially likely to reflect retrieved rather than generated knowledge. In this light, it seems more likely that the overall low redundancy might be attributable to non-theoretical factors such as the purposely diverse set of situations represented in the situational-IF prompts.

As indicated, redundancy in the explanations was also low overall. However, a one-way ANOVA examining the number of redundant explanations was significant, $F(2, 45) = 5.08$, $p < .01$. In line with the notion that explanatory knowledge about significant others is especially extensive, a follow-up contrast showed that participants listed significantly fewer redundant explanations for their significant others ($M = 0.87$) than for their stereotypes ($M = 1.48$) and nonsignificant others ($M = 1.17$) combined, $F(1, 45) = 11.23$, $p < .01$. Pairwise comparisons showed that the redundancy was significantly less for the significant other compared to stereotype, $t(45) = 3.29$, $p < .01$, and marginally less compared to the nonsignificant other, $t(45) = 1.86$, $p = .07$. The control conditions did not differ ($t < 1.4$). These findings bolster the argument that perceivers are especially likely to conceive of significant others in explanatory terms.

SELF-REGULATORY-SIGNIFICANCE RATINGS

Finally, Study 2 included four items to tap the self-regulatory significance of the targets. Given that the reliability coefficients for these items, computed separately for each target, were relatively high (α ranged from .70 to .75), the items were averaged for each target to create

an overall index of self-regulatory significance. Consistent with the assumption that conceptions of significant others are especially likely to include IF-THEN and explanatory knowledge in part because of their distinct self-regulatory significance, a planned contrast showed higher self-regulatory-significance for the significant other ($M = 5.72$) than for the stereotype ($M = 3.13$) and nonsignificant other ($M = 2.68$) combined, $F(1, 42) = 221.62$, $p < .01$.[7] The control conditions also differed, with the stereotype having higher self-regulatory significance than the nonsignificant other, $t(42) = 2.20$, $p < .05$, a finding discussed later in the General Discussion.

Taken as a whole, Study 2's results provide a strong conceptual replication of Study 1's key results, using different instructions to prompt the listing of IF-THENs and explanations and using confidence and length-of-knowledge ratings to tap target differences in the tendency to view others in IF-THEN and explanatory terms. Of importance, as in Study 1, because the procedures explicitly asked participants to explain their IF-THEN observations, the results show that psychological-state knowledge is particularly likely to serve an expressly explanatory function in representations of significant others.

STUDY 3

In Studies 1 and 2, participants listed IF-THEN observations in response to a nomothetic list of objective IFs. Psychological-state theories (PSTs) were then measured in terms of the psychological-state BECAUSE phrases offered as explanations for these observations. These explanations were treated as the perceived mediators of the observed IF-THEN relations they were offered up to explain—in essence, the psychological-state IFs of THENs. To measure PSTs more directly, Study 3 asked participants to list IF-THENs with the IFs provided by participants themselves and with all IFs referring directly to psychological states. Participants were expected to list the most PSTs about their significant other, a finding that would conceptually replicate Studies 1 and 2, yet extend them by virtue of the use of fully idiographic, open-ended procedures to elicit PSTs.

Study 3 also was designed to examine a critical aspect of the internal structure of PSTs. If perceivers are especially likely to conceive of significant others in terms of PSTs, this implies that the structural linkages between psychological-state IFs and the THENs they explain should be particularly strong. To assess this structural characteristic of PSTs, Study 3's participants listed psychological-state IFs and THENs on a computer, which recorded their listing latencies. The key hypothesis was that the component parts of PSTs about significant others ought to be retrieved from memory in tandem quite readily; thus, latencies to come up with psychological-state IFs to explain the THENs of significant others should be especially short.

Method

PARTICIPANTS

Thirty-six undergraduates (24 women, 12 men) enrolled in an introductory psychology course participated individually in this study for course credit or $10.

PROCEDURE

Participants signed up for a computer-based study on how people describe others. They first named a significant other, stereotype, and nonsignificant other in a randomized order, as in the prior studies, except on a computer. Instructions for the PST-generation task then appeared on the screen. PSTs were defined as IF-THEN descriptors with the IFs referring to psychological states. Participants were instructed to generate THENs first, followed by psychological-state IFs, because pretesting suggested this order was easier to grasp. Specifically, for each THEN-IF descriptor, participants were told to first come up with a THEN, which was defined as any characteristic, behavior, activity, or tendency of the target (e.g., "plays soccer" or "is shy"). After typing in the THEN, participants were told to think about the psychological state that they believe elicits the THEN and then type it into the computer. A psychological state was defined as any internal state (e.g., feeling, thought, goal) of the target. For each target, participants were asked to list as many THEN-IF descriptors as they could, with a minimum of six so that fairly reliable, average, listing-latencies could be computed. THEN-IF descriptors for each target were listed in a randomized order.

For each descriptor, participants were presented with a screen with a pair of blanks, situated one on top of the other. The top blank began with the name of their significant or nonsignificant other (e.g., "Bill . . . ") or the stereotype label (e.g., "A nerd . . . "). Participants were told to type in a THEN in this blank and then to hit the carriage return as soon as they finished typing. This signaled the cursor to move to the bottom blank, where participants were told to type in the psychological-state IF that they believe produces the THEN and then to hit the carriage return. Participants were asked to limit their THENs and IFs to approximately six words apiece. Participants were informed that after completing each THEN-IF descriptor, the descriptor would disappear and a new pair of blanks would appear. So participants could keep track of the number of THEN-IF descriptors listed, an easily discernible number appeared just above the top blank. To ensure that they understood the instructions, participants were given ample opportunity to ask for clarification and were given some THEN-IF examples (e.g., "Steve is defensive . . . if he feels threatened").

For each descriptor, the computer recorded the time it took participants to come up with a psychological-state IF after typing in a THEN as the time interval that began when participants hit the carriage return to signal completing a THEN, and that ended when they typed in the first character of the IF. If perceivers are especially likely to conceive of significant others in terms of PSTs, then these latencies should be quite short, indicating that psychological-state knowledge is tightly linked to the data it explains.

Results and Discussion

For significant others, participants named mainly family members (47%) and close friends (44%). The modal stereotype was "nerd" (17%), and the modal nonsignificant other was a friend of a friend (31%).

NUMBER OF THEN-IFS WITH PSYCHOLOGICAL-STATE IFS LISTED

A planned contrast examining the number of THEN-IFs listed about the significant other compared to the control targets combined was significant, $F(1, 35) = 9.24$, $p < .01$. As shown in Figure 5, participants listed more THEN-IFs about their significant other ($M = 6.61$) relative to stereotype ($M = 6.06$), $t(35) = 3.01$, $p < .01$, and relative to nonsignificant other ($M = 6.11$), $t(35) = 3.00$, $p < .01$. The control conditions did not differ, $t(35) = 1.00$, *ns*. Once again, these results suggest that PSTs—defined in this study as THEN-IFs with psychological-state IFs—are especially likely to be stored in memory about significant others.

To ensure that the above results were not due to a few participants listing an unusually large number of THEN-IFs for their significant others, the number of participants who listed more than the minimum of six THEN-IFs was examined. For significant others, close to a third of the participants generated more than six (30%), whereas only 10% or less did so for the control targets (3.3%, stereotype; 10%, nonsignificant others). The difference in these percentages across targets was significant, Cochran's $Q(2) = 10.40$, $p < .01$.

To examine whether participants complied with the instructions to list THEN-IFs with psychological-state IFs, two independent judges classified each IF as referring to a psychological state (" . . . because he wants attention") or not (e.g., " . . . when she's at work"). Interjudge agreement was 97.2%. Attesting to the clarity of the instructions, the overall number of non-psychological-state IFs was low ($M = 0.43$), and a one-way ANOVA on the number of THEN-IFs listed, excluding those with non-psychological-state IFs, yielded a pattern of means that was virtually identical to the original, $F(2, 70) = 6.69$, $p < .01$.

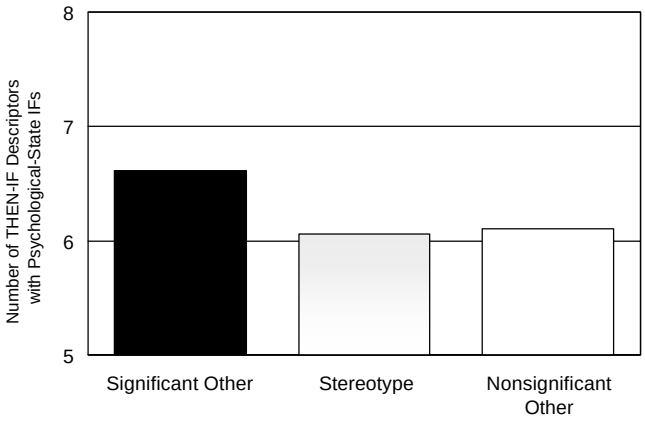

Figure 5 Study 3: Number of THEN-IF descriptors with psychological-state IFs (PSTs) listed.

REDUNDANCY IN THE THEN-IFS WITH PSYCHOLOGICAL-STATE IFS

As in Studies 1 and 2, it is worth examining redundancy in the psychological-state theories that were listed. Less redundancy might be expected among the theories participants listed for their significant others, reflecting the notion that they are likely to have a particularly rich pool of these theories to make sense of significant others. As well, it is important to rule out the possibility that variations across targets in redundancy might have contributed to the finding that participants listed the most PSTs for their significant other. Two blind, independent judges coded redundancy within each set of psychological-state IFs listed. Interjudge agreement was very high (99.7%), due partly to redundancy being low overall ($M = 0.13$). A one-way ANOVA examining redundancy across targets was not significant ($F < 2$), providing no additional evidence for the predicted target differences but ruling out the possibility that differences in redundancy account for the finding of spontaneously more PSTs listed for the significant other than the control targets.

Overall, then, these results conceptually replicate Study 1's finding that participants listed the largest proportion of psychological-state explanations for their IF-THEN observations about their significant other and Study 2's findings of higher confidence and length-of-knowledge ratings for the psychological-state explanations listed for the significant other versus the control targets. At the same time, these results extend these earlier findings in that PSTs were elicited directly and entirely idiographically in this study.

THE INTERNAL STRUCTURE OF PSYCHOLOGICAL-STATE THEORIES

Latencies in coming up with psychological-state IFs to explain THENs were log transformed. For ease of inter-

pretation, all reported means reflect raw latencies in seconds. To minimize noise, latencies for the first THEN-IF descriptor listed for each target were excluded from all analyses.[8] As indicated, the average number of non-psychological-state IFs was low and did not vary across targets; nonetheless, to conduct a pure test of the hypothesis regarding the internal structure of PSTs, latencies for non-psychological-state IFs were excluded from all calculations and analyses reported below. Finally, outlying latencies, defined as those that departed more than three standard deviations from each target condition's mean, were excluded.

As described, the time it took for participants to come up with psychological-state IFs to explain THENs served as a measure of the internal structure of PSTs, that is, the strength of the linkages within THEN-IF units of knowledge. For each participant, the time elapsing between completing a THEN and starting an IF was averaged across the THEN-IF descriptors listed for each target. A planned contrast comparing the averaged latency for the significant other to the latencies for the control targets combined was significant, $F(1, 35) = 15.24$, $p < .01$ (see Figure 6). Pairwise comparisons confirmed that the significant-other latency ($M = 1.68$) was significantly shorter than the stereotype latency ($M = 2.64$) and the nonsignificant-other latency ($M = 2.61$) ($ps < .01$). The control conditions did not differ, $t < 1$, *ns*.

To control for differences in the number of THEN-IFs listed, the average latency was recomputed including only the latencies for the second through sixth THEN-IFs listed for each target. The planned contrast pitting the significant other against the control targets was reliable, $F(1, 35) = 13.60$, $p < .01$, and pairwise comparisons confirmed that the latency was significantly shorter for the significant other relative to each control target ($ps < .01$). The control conditions did not differ ($t < 1$). Finally, the contrast pitting the significant-other versus the control conditions remained significant even when based on the latencies of only the second through the fourth THEN-IF descriptors for each target, $F(1, 34) = 9.19$, $p < .01$.[9]

In sum, Study 3's results provide further evidence for the predicted target differences in the amount of PSTs stored in memory. Moreover, they provide strong support for the hypothesis that PSTs about significant others have a distinct structural quality. Namely, they reflect especially tightly linked THEN-IF units of knowledge, as shown in the significantly greater ease with which participants retrieved psychological-state IFs to explain THENs about their significant other relative to the control targets.

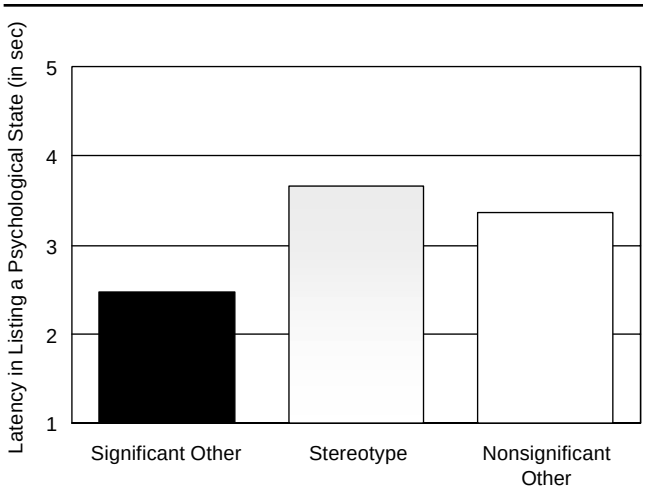

Figure 6 Study 3: Listing-latency measure reflecting the internal structure of psychological-state theories (in seconds).

GENERAL DISCUSSION

In recent decades, mounting evidence suggests that explanatory, theory-based forms of knowledge play an important role in how perceivers conceptualize objects and people. In the social-cognition literature, although researchers have long theorized that perceivers possess lay theories, the empirical tools and measures used in this literature have often treated features as the main units of social knowledge, with features typically taking the form of trait attributes (for a review, see Chen, 2001). However, paralleling trends in cognitive and developmental work, increasing numbers of social-cognitive researchers have begun to take seriously the notion that conceptions of others may go beyond trait-based units to lay, theory-based, or explanatory forms of knowledge (e.g., Read & Miller, 1993). The present research extends this core idea to the realm of significant-other representations.

Drawing in part from Mischel and Shoda's (1995) cognitive-affective personality system (CAPS) model, lay theories were defined in IF-THEN terms, with IFs referring not to the objective situations in which THENs are exhibited but rather directly to the psychological states that presumably mediate the relation between objective situations and observed responses. From this perspective, knowing the psychological-state IFs of someone's THENs means knowing the most proximal causes of these THENs. In this sense, such knowledge represents lay theories or explanations about the person—or psychological-state theories (PSTs).

A major aim of the present research was to highlight the need to consider the role of explanatory forms of knowledge in social perception in general, and to establish the important role of PSTs in particular. More specific goals were to test the hypothesis that perceivers are especially inclined to conceive of significant others in terms of PSTs and that this inclination would carry implications for the content and structure of significant-other representations.

Explanatory, Theory-Based Knowledge in Social Perception

At the broadest level, the present studies clearly suggest that perceivers conceive of others in explanatory terms more so than is typically recognized in much of the social-cognition literature. In particular, Study 1 showed that the proportion of IF-THEN observations that was backed by an explanation of any kind was relatively high overall (70% or greater) and that there was generally little redundancy in participants' explanations. Although most of the explanations for the control targets did not refer to psychological states, and instead referred to such things as traits, such explanations nonetheless imply that some of the knowledge perceivers have stored about others may serve an expressly explanatory function and that meaningful linkages exist in memory between these explanations and the knowledge they explain. Similarly, although the predicted target differences were found in Study 2, that is, explanations about significant others were more likely to refer to psychological states, were less redundant, and were held longer and with greater confidence, the fact that participants were able to list explanations for all of the targets with, once more, little redundancy overall suggests again that more attention needs to be paid to explanatory forms of knowledge in models of social perception in general.

Psychological-State Theories in the Content and Structure of Significant-Other Representations

On a more specific level, all three studies yielded evidence demonstrating that the content of significant-other representations is especially likely to include one particular form of explanatory knowledge—psychological-state theories (PSTs). In Studies 1 and 2, participants listed the most psychological-state explanations for their significant other and, in fact, the majority of the explanations they listed for their significant other referred to a psychological state, whereas PSTs were in the minority in the explanations listed for the control targets. Study 2's participants also reported greater confidence in the PSTs they listed about their significant other than those listed about the control targets and that they have known the PSTs about significant others longer than those about the control targets. Finally, using entirely idiographic listing procedures, Study 3 showed that participants listed the most THEN-IF descriptors with psychological-state IFs for their significant others.

In one sense, these results fit prior research showing, for example, that "privileged information" is more prevalent in descriptions of familiar versus less familiar targets (Prentice, 1990), that perceivers have more knowledge about the "private aspects" of significant others than various control targets (e.g., Andersen et al., 1998), and that open-ended descriptions of familiar and important targets are especially likely to include references to cognitive-affective units (Idson & Mischel, 2001). However, the present studies take these earlier findings in an important new direction by proposing that psychological-state knowledge may serve an explanatory role, particularly in conceptions of significant others. Studies 1 and 2 provide strong support for this proposition. In both of these studies, participants were explicitly asked to explain the targets' IF-THENs; thus, the PST findings from these studies can be seen as direct evidence for the explanatory nature of psychological-state knowledge in representations of significant others especially.

Put another way, the present studies shed light on the meaning of the especially large pool of psychological-state knowledge that perceivers possess about their significant others. Whether this knowledge is labeled psychological states, cognitive-affective units, privileged information, or private aspects, the current results suggest that whereas knowledge about someone's psychological states in and of itself may contribute meaning to a perceiver's understanding of that person, this knowledge also adds meaning by virtue of its explanatory relation to other knowledge stored about the person, such as his or her responses in objective situations. These results suggest, then, that psychological-state knowledge may not be stored simply in isolation but rather may be linked to other pieces of knowledge stored about a target.

Study 3 was particularly illuminating in this regard. This study focused on a key structural quality of PSTs—the linkage between psychological states and the responses they explain—and hypothesized that if perceivers are especially inclined to infer the psychological states of significant others to explain their responses, then these psychological states and responses should be structurally represented in the form of tightly linked IF-THEN units. Study 3's listing-latency results yielded strong support for this prediction, indicating that psychological-state knowledge—shown to be especially prevalent in representations of significant others—is not just isolated knowledge about the inner workings of others but rather is structurally and closely linked to other pieces of knowledge for which it provides a proximal explanation.

IF-THEN and Explanatory Knowledge About Stereotypes and Nonsignificant Others

Although stereotypes and nonsignificant others were not the primary focus, it is worth considering several differences that were found between these control targets. Specifically, Study 1's participants listed more IF-THEN observations for their stereotype than nonsignificant other. Although this difference did not hold up in the comparisons involving explanations, Study 2 yielded a marginally significant difference in the number of PSTs

listed for the stereotype and nonsignificant other, with more listed for the former. Study 2 also showed that participants' IF-THEN knowledge and PSTs about stereotypes were longer held than such forms of knowledge about nonsignificant others (although confidence ratings for the control targets did not differ for either IF-THENs or PSTs).

Although interpretation should be cautious because differences between the control targets were not seen for every dependent measure and were marginal at times, in all cases where there was a significant difference, the difference favored the stereotype. In the vast empirical literature on stereotyping and prejudice, stereotype content has been widely treated in terms of trait attributes; for example, the content of the African American stereotype might include poor, oppressed, and athletic (e.g., Devine, 1989). The present results, though, suggest that stereotype representations may include considerable IF-THEN and explanatory forms of knowledge both in absolute terms and relative to nonsignificant-other representations. These findings are interesting to consider in light of various recent strands of stereotyping research that suggest that stereotype content may be more complex than simple trait-based approaches imply (e.g., Andersen & Klatzky, 1987; Sherman, 1996). In fact, one line of work explicitly argues for a role for "cause-effect" relations in stereotype representation and use (Wittenbrink et al., 1997), as noted earlier.

Why might stereotype representations be more likely to include relatively more complex forms of knowledge—such as IF-THENs and explanations—than nonsignificant-other representations? Study 2's results for participants' self-regulatory-significance ratings provide one possible answer. Participants rated stereotypes higher in self-regulatory-significance than nonsignificant others, which suggests that they are likely to exert more effort in making sense of stereotypes. This greater effort may be one reason why perceivers tend to have more complex, situation-specific, and explanatory forms of knowledge about stereotypes than nonsignificant others. Overall, the present data push for further examination of potential explanatory bases of stereotype representations.

Relations to the Broader Literature

As described at the outset, the proposition that representational content and structure involve explanatory forms of knowledge was derived in part from theory-based models in the cognitive and developmental literatures (e.g., Murphy & Medin, 1985) as well as from recent social-cognitive work on explanations (e.g., Read & Cesa, 1991). However, it is worth noting that the definition for "theory" varies across this wide spectrum of models. For example, cognitive and developmental work, which has tended to focus on non-human entities (e.g., lawnmowers), has emphasized single, "grand" theories such as theories that refer primarily to an object's function. In contrast, theories were defined in the current research as knowledge that explains other stored knowledge rather than knowledge that fully accounts for who or what an entity is (see Read, 1987). Conceptualizing theories at this lower level of analysis seemed appropriate because of the focus on theories about people, about whom perceivers are likely to possess multiple theories to explain the myriad of responses that is typically observed of others. Still, it is important to acknowledge that higher order theories also might exist; for example, several IF-THENs may be encompassed by a single, broader theory. Overall, then, the present research should be seen as just one view of the content and structure of lay theories about individuals and social groups.

On a different note, by focusing on lay theories defined in terms of IF-THEN units of knowledge with the IFs referring to psychological states, the present approach assumes that perceivers infer the inner workings of others. As noted, this key assumption is supported by a diverse body of evidence (e.g., Malle, 1999; Repacholi & Gopnik, 1997). In fact, a growing number of researchers have begun to argue that inferences about others' mental states play a more important role in social perception than typically acknowledged. The proposed concept of psychological-state theories (PSTs) fits squarely with this trend. Of importance, though, unlike existing work, which has focused on questions pertaining to when inferences about psychological states are made or which perceivers make them, the current research focused on the explanatory role of psychological-state knowledge and documented differences in the prevalence of this role across different social targets.

Finally, by highlighting the distinct role of PSTs in significant-other representations, the present research fits another broader trend—one integrating the social cognition and close relationships literatures. This "relationship cognition" trend is important because it suggests that to fully understand the nature and use of social knowledge, it is critical to consider perceivers' relations with others; how self and others are related influences how one makes sense of others and, thus, how others are mentally represented. In short, work on relationship cognition highlights the "social" in social cognition, as does the present research.

Some Future Directions

One of the most pressing directions for future research is to examine the role of PSTs in the activation and use of significant-other representations in social perception. Research on the social-cognitive model of transference has defined the phenomenon as occurring when a significant-other representation is activated and

used to perceive new others, resulting in representation-derived perceptions and responses (Andersen & Glassman, 1996). If significant-other representations are especially likely to include PSTs—as the data show—then PSTs should have implications for how and when these representations are activated and used (Chen, 2001). For example, PSTs may serve as an especially powerful basis for the applicability-based activation of significant-other representations. Applicability refers to activation arising from the perceived "fit" or "match" between cues in a stimulus and stored knowledge (Higgins, 1996; see also Bruner, 1957; Hardin & Rothman, 1997). The present data suggest that cues in a new person that reflect PSTs should constitute an especially important basis for fit between a significant-other representation and the person.

Concluding Remarks

The present research established a role for PSTs in social perception and showed that perceivers are especially likely to call on their knowledge about the psychological states of significant others to explain the observed responses of these individuals. This pronounced tendency to make sense of significant others in terms of PSTs has consequences for the content and structure of significant-other representations. More broadly, this research indicates the need to incorporate explanatory, theory-based forms of knowledge in social-cognitive work on the nature of social knowledge and the processes that govern its use in social perception.

NOTES

1. The same held in Studies 2 and 3, both when order was treated as a six-level variable (reflecting all six order conditions) as well as when order was treated as a three-level variable (reflecting the averaging of the two order conditions in which the same target was described or rated first).

2. An arcsine transformation was used for the proportion measures to reduce skew in their distribution. However, all reported means reflect the raw proportions.

3. Three participants were excluded from all analyses of the proportion of psychological-state explanations because they did not list any BECAUSE phrase for one or more of the targets.

4. I thank an insightful reviewer who suggested both of these alternative accounts.

5. There were four exceptions to this, with 2 participants missing one THEN for one of the situational-IF prompts for one of the three targets and 1 participant missing two THENs for two of the prompts for one of the targets. Because this number was so small, analyses are reported in terms of the sheer number of explanations listed in each category rather than proportions of each type. Not surprisingly, preliminary analyses on proportion measures were virtually identical to analyses based on the sheer number measure.

6. Four participants had missing data for these ratings and thus were excluded from these analyses.

7. Three participants had missing data for these ratings and thus were excluded from these analyses.

8. Analyses including the latencies from the first THEN-IF descriptors listed for each target yielded patterns of means that were almost identical to the reported ones.

9. The second through fourth THEN-IF descriptors of one participant all happened to refer to non-psychological-state IFs, so this participant was excluded from this analysis.

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