



Lay personality knowledge and dispositionist thinking: A knowledge-activation framework ☆

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Received 20 August 2004; revised 29 March 2005

Available online 17 May 2005

Abstract

We explicate a knowledge-activation framework depicting the link between lay personality knowledge and dispositional judgments, building on work by Dweck, Chiu, and Hong (1995a, 1995b). According to this framework, most people possess knowledge consistent with an entity theory (personality is fixed) and incremental theory (personality is malleable), which operates according to knowledge-activation principles. Consistent with this claim, we find that people render more confident dispositional judgments when their entity knowledge is made relatively more accessible through priming manipulations that activate aspects of their existing knowledge. Findings also illustrate the usefulness of incorporating both specific and general knowledge in our analysis. The present framework enhances and complements the individual-differences approach to the study of person theories prevalent in the literature. © 2005 Elsevier Inc. All rights reserved.

Keywords: Lay theories; Dispositional inferences; Knowledge activation

Introduction

Lay dispositionism, the tendency to use personality traits or other dispositions (e.g., intelligence) to explain and predict social actions or outcomes (Ross & Nisbett, 1991), has been linked to many inferential phenomena. For example, people tend to infer an underlying trait based on a trait-consistent behavior, even if a situational explanation of the behavior is warranted (Gilbert & Malone, 1995; Jones, 1979). People also make overly confident predictions about another person's behavior in

a novel situation from knowledge of relevant traits, with insufficient regard to uncertainties about the person's construal of the situation (Dunning, Griffin, Milojkovic, & Ross, 1990). Furthermore, people overestimate the consistency of trait-relevant behavior across situations (Kunda & Nisbett, 1986).

A growing body of research on lay theories has emerged in social, cultural, and developmental psychology (for a review, see Morris, Ames, & Knowles, 2001), attesting to the importance of commonsense knowledge about the nature of the self and others in social thinking. Dweck and colleagues propose that people's tendency to subscribe to lay dispositionism can be traced to their general theories about the malleability of personality (*person theories*) (Chiu, Hong, & Dweck, 1997; Dweck, Chiu, & Hong, 1995a; Dweck, Hong, & Chiu, 1993). Specifically, an *entity theory*, the belief that personality consists of a set of fixed traits, orients the perceiver to use traits as a unit of analysis and to believe that behaviors across situations are mediated by underlying traits. This belief fosters a strong tendency to subscribe to inferential practices

☆ We acknowledge support by a SSHRC doctoral fellowship to Connie Poon, and a SSHRC grant to Derek Koehler. This article is based on Part II of Poon's dissertation. Study 2 was presented at the Annual Meeting of the American Psychological Society, Toronto, in June of 2001. Study 3 was presented at the Annual Meeting of the Society for Personality and Social Psychology, Savanna, in February of 2002. We thank Emily Marks, Jodi Cryderman, Natasha Chlebowski, and Jamis Goertz for their assistance with the studies.

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associated with lay dispositionism. By contrast, an *incremental theory*, the belief that personality consists of malleable qualities, orients the perceiver towards understanding situational-specific psychological factors (e.g., emotional states and expectancies) that mediate behaviors, rather than towards assessing traits. This belief leads to a weaker proclivity for lay dispositionism.

Evidence based on inter-individual variations in person theories measured at a particular moment

This proposal regarding the relation between person theories and lay dispositionism is supported by research that largely takes an individual-differences approach (Dweck et al., 1995a). Typically, researchers measure participants' person theories *at a particular moment*, classifying those who hold an entity theory as *entity theorists*, and those who hold an incremental theory as *incremental theorists*. Their tendency to subscribe to lay dispositionism is often assessed concurrently (within the same experimental session or questionnaire package) or proximally (within a one- to two-week interval) with the measurement of person theories. Relative to incremental theorists, entity theorists more readily attribute traits to a person based on trait-consistent behavior in a particular situation (Chiu et al., 1997; Heyman & Dweck, 1998). Entity theorists also predict behaviors from a person's traits with greater confidence (Chiu et al., 1997). Moreover, entity theorists are more certain that trait-relevant behaviors will be consistent across situations (Chiu et al., 1997), and that a person's traits will be temporally stable (Erdley & Dweck, 1993).

The complexity of the relation between lay personality knowledge and dispositional judgments is not adequately depicted by the "time-limited" individual-differences approach predominant in the literature. Particularly, this approach does not capture temporal instability in person theories and its implications for dispositional judgments. The test-retest reliability of the three-item Person Theory Measure, a measure of general beliefs about the malleability of personality, drops from .82 over a two-week interval (Dweck et al., 1995a) to only .43 over an eight-week interval (Poon & Koehler, 2005). This level of temporal stability is arguably lower than that of many other individual-differences variables as measured by self-report (e.g., test-retest reliabilities for scales tapping extraversion and anxiety are .80 and .73 respectively over eight weeks; for a review, see Schurmerger, Zarrella, & Hotz, 1989). Such instability limits the long-term predictive validity of person theories measured on a one-shot basis. Poon and Koehler (2005) showed, for example, that while people's confidence in inferring an individual's standing on a trait (e.g., "tidy") from their standing on a semantically related trait (e.g., "punctual") was clearly associated with their person theories as measured on the day the inferences were made,

its association with person theories as measured a month or two prior to the inference task was much weaker.

A knowledge-activation framework: Conceptual extensions

Although person theories are often measured as an individual-differences variable on a one-shot basis, Dweck and colleagues acknowledge the theoretical possibility that entity and incremental theories are knowledge constructs that might co-exist within an individual. Indeed, along with other researchers (e.g., Anderson, 1995; Kruglanski, 1995), they have suggested (but not directly tested) that these theories can profitably be conceptualized within a knowledge-activation framework (Dweck, Chiu, & Hong, 1995b). Extending this conjecture, we will contend specifically that a knowledge-activation framework can elucidate dynamic relations involving lay personality knowledge and dispositional judgments, including the instability in person theories noted earlier. In this article, we develop such a knowledge-activation conceptualization, and empirically assess its usefulness.

Dweck and colleagues have focused on unitary, abstract notions regarding the malleability of personality (e.g., agreement with the statement, "The kind of person someone is, is something basic about them, and it can't be changed very much," Dweck et al., 1995a, p. 269). In the present analysis, we consider also relatively concrete or specific pieces of knowledge supporting these abstract notions, such as factors shaping personality, ideas about specific traits, and memory of particular individuals (e.g., John becomes more courteous due to his parents' training). It is assumed that most people have acquired from their socio-cultural environment some knowledge consistent with an entity theory and some consistent with an incremental theory. Within an individual, available pieces of entity-theory-consistent knowledge (including the abstract theory itself) form a loose knowledge cluster (*entity knowledge*), as do pieces of incremental-theory-consistent knowledge (*incremental knowledge*).

Entity and incremental knowledge may operate in a manner similar to other constructs that have been widely investigated using a knowledge-activation approach, such as trait concepts (e.g., Higgins, Rholes, & Jones, 1977), stereotypes (e.g., Sinclair & Kunda, 1999), and cultural theories (e.g., Hong, Morris, Chiu, & Benet-Martinez, 2000). Importantly, that individuals possess certain knowledge does not entail that they constantly apply it in their judgments. Existing personality knowledge needs to be activated (brought to mind) to influence judgments. Activation is assumed to spread within the entity and incremental cluster. The *accessibility* of knowledge (the ease with which existing knowledge is retrieved) contributes to its activation (cf. Higgins, 1996).

While the extent to which relatively activated knowledge is ultimately applied in judgments may depend on other factors, such as epistemic motivations (cf. Chiu, Morris, Hong, & Menon, 2000; Ford & Kruglanski, 1995) and the judged relevance of the knowledge (cf. Higgins, 1996), here we focus on accessibility as it is a cornerstone of the knowledge-activation approach.

Like other knowledge constructs, the accessibility of lay personality knowledge may be affected by goals, prior activation, and interconnectedness with other existing knowledge (cf. Higgins, 1996). Situational factors may produce temporary variations in the relative accessibility of entity versus incremental knowledge within an individual. Chronic individual differences in knowledge accessibility may result from differential exposure to situations which engender relatively more frequent application of entity or incremental knowledge over a prolonged period (e.g., stable differences in family environments) (cf. Dweck et al., 1995b; Higgins, 1996). At any given time, the relative accessibility of entity versus incremental knowledge of an individual is a combined outcome of: (1) its chronic accessibility and (2) temporary accessibility due to relatively transient situational influences (cf. Higgins, 1996). Given that each of the core theories (unitary, abstract belief about the malleability of personality) is loosely linked to other pieces of knowledge consistent with it, one's theorist status may serve as a general index (not necessarily the only index) of the relative accessibility of one's entity versus incremental knowledge *at the time of measurement*. Willingness to subscribe to an entity (incremental) theory can be taken as an indication that entity (incremental) knowledge is relatively more accessible at the time of measurement and therefore potentially more influential in inferential judgments.

In sum, based on factors known to affect knowledge activation and use, one can specify conditions under which the relative influence of entity versus incremental knowledge varies between and within individuals. Thus, a knowledge-activation framework holds promise in capturing complex, dynamic relations between lay personality knowledge and dispositional judgments.

Past findings can be readily interpreted within this framework. In many studies where participants' dispositional judgments are assessed concurrently or proximally with one-shot measurement of their person theories (e.g., Chiu et al., 1997; Gervy, Chiu, Hong, & Dweck, 1999), theory effects may reflect inter-individual variations in the relative accessibility of entity versus incremental knowledge *at or near the time of judgment*. Our finding that person theories exhibit some temporal instability may reflect within-person variation in knowledge accessibility due to idiosyncratic, naturally-occurring changes in everyday contexts (e.g., John's entity knowledge has become relatively more accessible since he re-connected with a friend whose personality has

never changed) (Poon & Koehler, 2005). This framework can also accommodate chronic individual differences in knowledge accessibility. However, given that temporal instability may render one-shot measurement of person theories inadequate for depicting stable individual differences, our approach suggests that multiple measurements of the same individuals, averaged over an extended period, may be needed to yield better estimates of chronic accessibility.

Current research: Empirical extensions

The current research empirically evaluates two aspects of the knowledge-activation framework. The first concerns the additional insights that can be obtained by incorporating relatively specific personality knowledge in this framework. One advantage, we suggest, pertains to the usefulness of trait-specific analysis. In other lines of research, the value of such analysis is evident. For example, Gidron, Koehler, and Tversky (1993) show that people perceive differences among trait terms in the minimum frequency of trait-consistent behaviors inherent in their meanings (e.g., *friendly* implies a higher minimum frequency of trait-consistent behaviors than *creative*). Hence, for different traits, people require different number of trait-relevant behaviors for attribution, and expect different levels of cross-situational consistency in trait-relevant behaviors (see also Rothbart & Park, 1986). As another example, Ross (1989) proposes that people perceive some traits to be more stable than the others, and that a theory of stability (change) induces a tendency to exaggerate consistency (change) between one's past and present standing on various traits. While Dweck et al. (1995a) show that a person may hold different malleability theories across broad domains (e.g., morality, intelligence, and the world), trait-specific differences have not been explored. The current research extends Dweck and colleagues' work by exploring the possibility that a person may perceive differences in malleability among traits (e.g., seeing *polite* as more malleable than *aggressive*). Such differences may reflect culturally shared understanding or be specific to an individual (cf. Ross, 1989). In Study 1, we investigate the role of such trait-specific knowledge in dispositional judgments.

The second, more fundamental issue we explore concerns the premise that entity and incremental knowledge clusters are possessed by most people, subject to principles governing the operations of other knowledge constructs (e.g., stereotypes and cultural theories), as described earlier. To date, there is no direct empirical evidence for this supposition. The main focus of this research is to empirically assess the viability of a knowledge-activation approach to the study of person theories. As a litmus test, the relative accessibility of participants' entity versus incremental knowledge was

manipulated through recent prior activation (Studies 2 and 3). The present framework predicts that participants should make more (less) extreme dispositional judgments when their entity (incremental) knowledge is made relatively more accessible.

Clear demonstration of knowledge accessibility effects requires procedures that utilize participants' existing knowledge. In Study 2, participants were asked to explain why the personality of a fictitious character, presented in a biography, remained unchanged (*entity-prime condition*) or changed a lot throughout his life (*incremental-prime condition*). As people tend to select and use pieces of existing knowledge that fit well with the hypothesis to be explained (cf. Koehler, 1991), entity (incremental) knowledge is assumed to be made relatively more accessible, temporarily, in the former (latter) condition. Similarly, in Study 3, participants were asked to evaluate the meaning of proverbs consistent with the notion that personality is fixed (*entity-prime condition*) or with the notion that personality is malleable (*incremental-prime condition*), on the assumption that interpretation of these proverbs requires use of the existing folkloristic or experiential knowledge being targeted.

These priming manipulations differ in an important way from a previously-used theory manipulation in which participants were presented with a fabricated scientific article containing persuasive arguments and empirical evidence for either an entity or incremental theory (e.g., Chiu et al., 1997; Levy, Stroessner, & Dweck, 1998). Use of the scientific article served well for the researchers' purpose of establishing causal effects of person theories on judgments. Yet, it is unsuitable (and was not intended) for the present purpose of capitalizing on the existing clusters of entity and incremental knowledge and assessing the impact of their relative accessibility on judgments. The effect of the scientific article might, as our framework would predict, result from momentary changes in the accessibility of existing knowledge, but it is also likely to impart participants with new and supposedly conclusive knowledge on whether personality is fixed or malleable, potentially producing enduring

changes to their person theories. In contrast, our priming procedures were designed to temporarily affect the relative accessibility of existing entity versus incremental knowledge, without providing participants with new, definitive knowledge that might create lasting changes in their beliefs about the malleability of personality.

Study 1

This study investigates the relation between dispositional judgments and naturally-occurring beliefs about the malleability of personality at the time of judgments, with particular attention to the predictive utility of trait-specific beliefs. Generally, we expect stronger entity beliefs to be associated with more confident dispositional inferences, whether we consider between-person variations in malleability beliefs, or within-person variations in perceived malleability among specific traits.

Method

Introductory psychology students ($n=97$) first completed a questionnaire on dispositional inferences. Each participant made four types of dispositional inferences: (1) predicting trait-relevant behaviors from traits, (2) inferring traits from trait-relevant behaviors, (3) predicting cross-situational consistency of trait-relevant behaviors, and (4) predicting temporal stability of traits. Each item followed a format used in Kunda and Nisbett's (1986) research on co-variation judgments, and involved an inference regarding a single trait. Table 1 illustrates four inference tasks involving the trait *affectionate*. Participants made judgments on a probability scale running from 0 to 100%. The midpoint of this scale (50%) indicates the belief that inferences cannot be made with any confidence based on the information provided. Increasing values beyond the midpoint reflect increasing confidence in dispositional inference. Each participant made inferences regarding 30 commonly-used personality traits, such as *warm*, *polite*, *optimistic*, and *assertive*, for

Table 1
An example item for each type of dispositional inference (Study 1)

| Inference type | Example |
|--|--|
| Predicting trait-relevant behaviors from traits | Person A is more strongly characterized by the trait <i>affectionate</i> than Person B. What is the probability that you would find Person A to behave in a more affectionate way than Person B in a particular situation? |
| Inferring traits from trait-relevant behaviors | Person A behaved in a more affectionate way than Person B in a particular situation. What is the probability that Person A is more strongly characterized by the trait <i>affectionate</i> than Person B? |
| Predicting cross-situational consistency of trait-relevant behaviors | Person A behaved in a more affectionate way than Person B in a particular situation. What is the probability that in a completely different situation, you would find Person A to behave in a more affectionate way than Person B? |
| Predicting temporal stability of traits | Presently, Person A is more strongly characterized by the trait <i>affectionate</i> than Person B. What is the probability that Person A will be more strongly characterized by the trait <i>affectionate</i> than Person B five years from now? |

each inference type. (All the traits are listed in Table 3, first column.) The order in which the four inference types appeared in the questionnaire was counterbalanced between participants in a Latin square design.

Next, participants completed a 30-item scale on their beliefs about the malleability of a set of specific traits. Each item concerns one of the 30 traits used in the inference task, and is worded similarly to the Person Theory Measure developed by Dweck et al. (1995a) (see below). For example, for the trait *affectionate*, participants indicated on a 6-point scale (1 = *strongly agree*; 6 = *strongly disagree*) the extent to which they agreed with this statement: “How affectionate a person is, is something fixed, and cannot be changed very much.” Each participant’s ratings on the 30 items were averaged to yield an *omnibus trait malleability score* (Cronbach’s $\alpha = .93$). Lower scores reflect a stronger belief that this set of specific traits are fixed. Taken individually, a response to a specific item (*individual trait malleability score*) reflects one’s belief about the malleability of a specific trait.

Participants also completed Dweck et al.’s (1995a) Person Theory Measure. This measure comprises three items: (1) “The kind of person someone is, is something basic about them, and it can’t be changed very much”; (2) “People can do things differently, but the important parts of who they are can’t really be changed very much”; (3) “Everyone is a certain kind of person and there is not much that can be done to really change that” (p. 269). Participants indicated the extent to which they agreed with each item on a 6-point scale (1 = *strongly agree*; 6 = *strongly disagree*). Ratings on the three items were averaged to yield a *person theory score* (Cronbach’s $\alpha = .87$), with a lower score reflecting a stronger general belief that personality is fixed (see Dweck et al., 1995a; for details about the scale).

Results

Responses to different measures of malleability beliefs

As one would expect some conceptual relation between person theory (i.e., general beliefs about the malleability of personality) and beliefs about the malleability of a set of specific traits as a whole, not surprisingly, person theory scores and omnibus trait malleability scores were moderately positively correlated ($r = .45$, $p < .01$). The degree to which person theory scores were associated with individual trait malleability scores varied among specific traits. The average correlation between person theory scores and individual trait malleability scores was .26 across all 30 traits. Highest correlations were obtained for the traits *loyal*, *reliable*, *affectionate*, *ambitious*, and *active* (.48, .42, .39, .37, and .36, respectively), whereas lowest correlations were obtained for the traits *tidy*, *secretive*, *shy*, *organized*, and *unconventional* (.08, .10, .12, .14, and .17, respectively). What underlies the variability in the degree to which the

general person theory resembles the individual trait theories? Conceivably, some traits bear stronger conceptual links with people’s general conception of personality than others (e.g., people’s general conception of a person may hinge more heavily on the trait *affectionate* than the trait *tidy*). From a knowledge-activation perspective, activation is more likely to spread between a specific trait construct and a general conception of personality under conditions of high connectedness (cf. Higgins, 1989). For specific traits that are more strongly connected to a general conception of personality, one might therefore expect closer resemblance between general person theory and individual trait theories.

Inter-individual variations in malleability beliefs at the time of judgment

Aggregating dispositional judgments across traits. To examine the relation between inter-individual variations in malleability beliefs and various kinds of dispositional judgments, we first averaged each participant’s probability judgments over all 30 items within each inference type, thus yielding four judgment scores per participant. These judgment scores served as the dependent variable in two separate regression analyses, with malleability beliefs, inference type, and their interaction as predictors. Participants’ malleability beliefs were indexed by their omnibus trait malleability scores in one analysis, and by their person theories scores in another (see Table 2).

Before we present our results, some technical details are in order. Note that malleability beliefs was a continuous between-subject variable here, and inference type was a categorical within-subject variable. If we use mixed ANOVA to analyze such data, it is necessary to convert malleability beliefs into a categorical variable, and some information may be

Table 2
Summary of regression analyses for variables predicting dispositional judgments (Study 1)

| Source | df | F | |
|---------------------------------------|-----|----------------------------|---------------|
| | | Omnibus trait malleability | Person theory |
| <i>Between subjects</i> | | | |
| Malleability beliefs | 1 | 11.19** | 0.93 |
| S | 95 | (333.47) | (369.11) |
| <i>Within subjects</i> | | | |
| Inference type | 3 | 37.23*** | 36.82*** |
| Inference type × malleability beliefs | 3 | 1.85 | 0.77 |
| Inference type × S | 285 | (53.27) | (53.89) |

Note. Judgments were collapsed over 30 traits. Variables were hierarchically entered in the order listed. Values enclosed in parentheses represent mean square errors. S = subjects within groups. See Pedhazur (1982, Chapter 14) for technical details of how data obtained in mixed designs can be analyzed using multiple regression analyses.

** $p < .01$.

*** $p < .001$.

lost by such conversion. To preserve malleability beliefs as a continuous variable, we chose to use multiple regression analyses instead of ANOVA. In our multiple regression analyses, we used the technique of criterion scaling to identify and control for variance due to individual differences (as in a mixed ANOVA). Briefly, a subject vector consisting of the unstandardized predicted score or mean on the criterion (i.e., the dependent or predicted variable) for each subject was created in the computation process. Creation of this vector allows for separation of variance due to individual differences from unexplained error, and hence more precise and sensitive tests (see Pedhazur, 1982, Chapter 14, for details of how criterion scaling can be applied in multiple regressions to analyze mixed designs). Results of our analyses are summarized in Table 2, in a format typically used for presenting mixed-ANOVA results.

When the malleability beliefs were indexed by omnibus trait malleability scores, we found a significant relation between malleability beliefs and judgments (see Table 2, top panel). To elucidate this relation, Fig. 1 (top panel) depicts the slope of a simple regression of partici-

pants' composite judgment scores (computed by averaging each participant's judgments across all traits and inference tasks) on their omnibus trait malleability scores. As predicted, participants with lower omnibus trait malleability scores, namely those who expressed a stronger belief that this set of specific traits are fixed, made more confident dispositional inferences than those with higher omnibus trait malleability scores. A relation in a similar direction, though less pronounced (see Fig. 1, bottom panel) and non-significant (see Table 2, top panel), was observed between person theory scores and dispositional judgments.

Malleability beliefs appear to have a similar effect on the four types of dispositional inferences. Inference type did not interact reliably with malleability beliefs to influence judgments (see Table 2, bottom panel).¹ Belief-related effects aside, we obtained a significant main effect of inference type (see Table 2, bottom panel). Generally, stronger dispositional inferences were made from a person's traits ($M=74.3\%$ when predicting trait-relevant behaviors from traits; $M=68.9\%$ when predicting temporal stability of traits) than from trait-relevant behaviors ($M=63.7\%$ when predicting cross-situational consistency of trait-relevant behaviors; $M=66.0\%$ when inferring traits from trait-relevant behaviors). As trait characterization of a person usually implies more than just one instance of trait-relevant behavior, it is perhaps not surprising that a person's trait characterization affords stronger dispositional inferences than a trait-relevant behavior.

Trait-by-trait dispositional judgments. The relation between inter-individual variations in malleability beliefs and dispositional judgments at the aggregate level also holds at the level of individual traits. Table 3 shows how scores on various measures of malleability beliefs were related to dispositional judgments of individual traits. Generally, participants with lower omnibus trait malleability scores, or those who expressed a stronger belief that this set of specific traits are fixed, made significantly more confident dispositional inferences for most traits. Relations of comparable strength and form were observed when individual trait malleability scores were taken to reflect beliefs specific to the target trait in each inference item. When person theory scores were used, a relation in the same direction, albeit less

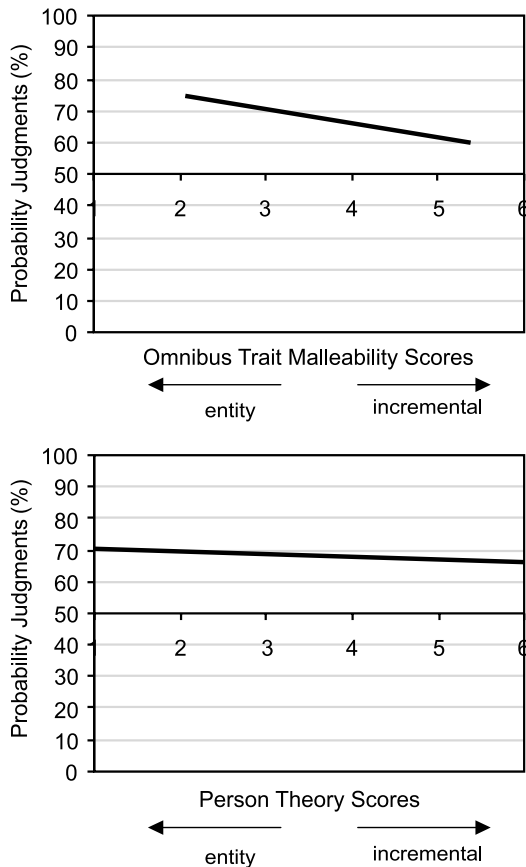


Fig. 1. Probability judgments as a function of omnibus trait malleability scores (top panel) and person theory scores (bottom panel) in Study 1.

¹ In this research, all behaviors in the inference task were evidently trait (or disposition)-relevant, as they were categorized in trait terms (see Table 1). However, if behaviors are not clearly trait-relevant, a Malleability Beliefs \times Inference type interaction might emerge. General and trait-specific malleability beliefs might have a more pronounced effect on inferences based on traits than on inferences based on concrete behaviors that are not clearly trait-relevant. This possibility awaits further research.

Table 3
Correlations and regression slopes between dispositional judgments for each trait and different measures of malleability beliefs (Study 1)

| Trait in inference task | Omnibus trait malleability scores | | Individual trait malleability scores | | Person theory scores | |
|-------------------------|-----------------------------------|----------|--------------------------------------|----------|----------------------|----------|
| | <i>r</i> | <i>b</i> | <i>r</i> | <i>b</i> | <i>r</i> | <i>b</i> |
| Organized | -.43** | -7.0** | -.09 | -.9 | -.10 | -.9 |
| Polite | -.31** | -5.7** | -.21* | -2.3* | -.10 | -1.1 |
| Secretive | -.30** | -5.4** | -.31** | -3.5** | -.09 | -1.0 |
| Shy | -.29** | -5.8** | -.44** | -4.9** | -.13 | -1.6 |
| Athletic | -.21* | -4.3* | -.46** | -4.2** | -.08 | -.9 |
| Assertive | -.32** | -5.2** | -.39** | -3.7** | -.04 | -.4 |
| Unconventional | -.12 | -2.1 | -.23* | -2.7* | -.02 | -.2 |
| Practical | -.31** | -4.9** | -.24* | -2.7* | -.11 | -1.0 |
| Punctual | -.30** | -5.7** | -.26** | -2.3** | .01 | .1 |
| Ambitious | -.21* | -3.6* | -.27** | -2.6** | -.01 | -.1 |
| Affectionate | -.21* | -3.6* | -.25* | -2.4* | -.14 | -1.4 |
| Loyal | -.25* | -4.3* | -.27** | -2.6** | -.12 | -1.3 |
| Active | -.22* | -3.6* | -.37** | -3.0** | -.02 | -.3 |
| Competitive | -.33** | -5.6** | -.39** | -3.7** | -.15 | -1.6 |
| Procrastinating | -.36** | -6.5** | -.32** | -3.3** | -.05 | -.5 |
| Sensitive | -.22* | -3.7* | -.19† | -2.0† | -.14 | -1.4 |
| Independent | -.21* | -4.1* | -.21* | -2.3* | -.12 | -1.4 |
| Idealistic | -.24* | -4.2* | -.10 | -1.1 | -.04 | -.4 |
| Sympathetic | -.19† | -3.5† | -.21* | -2.5* | -.13 | -1.4 |
| Conscientious | -.23* | -4.0* | -.23* | -2.7* | -.09 | -1.0 |
| Anxious | -.26** | -5.2** | -.53** | -6.3** | -.10 | -1.2 |
| Moody | -.22* | -4.0* | -.50** | -4.9** | -.04 | -.5 |
| Likable | -.24* | -4.6* | -.48** | -5.1** | -.14 | -1.6 |
| Warm | -.28** | -5.0** | -.49** | -5.0** | -.06 | -.7 |
| Tidy | -.29** | -5.4** | -.31** | -3.1** | .02 | .2 |
| Unpredictable | -.18† | -3.4† | -.06 | -.8 | -.03 | -.3 |
| Reliable | -.31** | -5.6** | -.24* | -2.4* | -.17† | -1.9† |
| Curious | -.20* | -3.6* | -.37** | -4.2** | -.16 | -1.8 |
| Optimistic | -.17† | -2.9† | -.15 | -1.4 | .01 | .1 |
| Tolerant | -.16 | -2.8 | -.18† | -1.8† | .01 | .1 |
| Mean | -.25 | -4.5 | -.29 | -3.0 | -.08 | -.8 |

Note. Correlation coefficients (*r*) were between probability judgments (averaged over inference types) and scores on various measures of malleability beliefs. Unstandardized regression coefficients (*b*) depict change in judged probability per unit change along various measures of malleability beliefs in regression slopes. Negative (downward) slopes indicate that lower scores on the belief measures were associated with higher probability judgments.

† $p < .10$.

* $p < .05$.

** $p < .01$.

pronounced and non-significant, was found for most traits.

Intra-individual variations in malleability beliefs across traits

Each participant tended to perceive some differences in malleability among traits, as evidenced by within-person variations in individual trait malleability scores. We now examine the relation of such variations to a person's dispositional judgments across specific traits. We conducted a hierarchical regression analysis in which dispositional judgments for a given trait (averaged across inference types) were first regressed on the subject variable, created using criterion scaling to represent variance due to individual differences. The subject vector consisted of the unstandardized predicted score or mean on the criterion (i.e., the dependent or predicted variable) for each subject (see Pedhazur, 1982, Chapter 14, for details of how criterion scaling can be applied in

multiple regressions to analyze designs involving repeated measures). This step controlled for inter-individual variations in judgments. Next, the perceived malleability of the trait was entered. To isolate within-person variations in perceived malleability across traits, the malleability variable in this analysis was formed by calculating, for each participant, a mean of the individual trait knowledge scores across the 30 traits (i.e., omnibus trait malleability score) and then subtracting the mean from each of its contributors. As predicted, less confident judgments were made for traits perceived by the individual to be relatively malleable than for those perceived to be more fixed, $b = -2.29$, $t(2808) = -15.44$, $p < .001$.

Discussion

This study illustrates the incremental utility of considering trait-specific beliefs, which are conceptually

and empirically related to their general beliefs about the malleability of personality.² First, inter-individual variations in trait-specific malleability beliefs predicted dispositional judgments better than general beliefs as measured by person theory scores. Second, within-person variations in trait-specific malleability beliefs predicted fine-grained differences in a person's dispositional judgments among traits. Such within-person analysis is not possible if we consider only general malleability beliefs.

In this study, participants' malleability beliefs were assessed on a one-shot basis, concurrent with their dispositional judgments. As malleability beliefs are somewhat unstable over time, such beliefs may not be very predictive of dispositional judgments at another point in time, especially over long intervals (Poon & Koehler, 2005). Temporal instability in malleability beliefs may be conceptualized as within-person variations in the relative accessibility of existing entity versus incremental knowledge. With a knowledge-activation conceptualization, one can readily specify (and test) mechanisms underlying such variations by drawing on factors known to affect knowledge accessibility.

Study 2

The relative accessibility of entity or incremental knowledge may be increased by recent prior activation (cf. Higgins, 1996). In Study 2, participants' entity or incremental knowledge was primed (or activated) before they made dispositional judgments in an allegedly unrelated study. According to the present framework, entity (incremental) knowledge would become relatively more accessible in the entity-prime (incremental-prime) condition. Participants were predicted to make more confident dispositional inferences after receiving an entity prime than after receiving an incremental prime.

Method

Priming

Introductory psychology students ($n = 104$) were invited to participate in two allegedly unrelated studies. The first study, referred to as a *study of reading comprehension and explanation*, was used to introduce the priming manipulation. Participants were asked to read and answer questions about three passages. The first passage was on gardening, and the second on cooking. They were created to conceal our intention of using the third passage, a biography, as a prime. The two-page biography

detailed the achievements of a fictitious Nobel Prize winner named "Max Hermann," the major milestones of his life (e.g., born in Germany, attended university in Germany, and later settled in the USA), along with descriptions of his personality. Participants were randomly assigned to one of the two priming conditions. In the *entity-prime condition*, Hermann was portrayed as unchanging throughout his life, being introverted and analytical from childhood through adulthood to old age. In the *incremental-prime condition*, temporal changes in his Hermann's personality were emphasized. He was first described as a rebellious youth, then as a single-minded, introverted scientist during adulthood, and finally as an outgoing, generous old man concerned with spiritual issues. Participants were asked to use their own knowledge to explain why Hermann's personality did not change (entity-prime condition) or changed a lot throughout his life (incremental-prime condition). The biographies did not directly provide the explanations, but participants could refer to the material in the biographies in generating their explanations. As participants were asked to apply aspects of their existing knowledge consistent with the hypothesis to be explained, we assumed that the relative accessibility of the targeted cluster of knowledge would be temporarily increased as a result.

Dispositional inferences and belief ratings

Next, participants proceeded to a *social judgment study*. They completed the dispositional inference questionnaire used in Study 1. In addition, they expressed their views on several dimensions of human nature (e.g., *happy–unhappy*, *untrustworthy–trustworthy*, *rational–irrational*), including whether or not people's personality can change on a 1 (*can always change*) to 9 (*cannot change*) scale. We included only this one-item general belief measure (embedded among other "distracter" items), instead of our 30-item omnibus trait malleability measure, to prevent participants from consciously connecting the priming manipulation with the social judgment portion of this experiment. Finally, participants were asked to write down any ideas they had about the purpose of the experimental session.

To maintain the cover story that the two studies were unrelated, apart from separate study names, we used separate consent forms and different typefaces for the explanation and social judgment questionnaires. None of our participants reported suspicion that the biography in the explanation task was intended to influence their subsequent social judgments.

Results

Dispositional judgments

We averaged each participant's probability judgments for all 30 items within each inference type. The resultant scores were submitted to a 2 (priming) \times 4

² It could be argued that the omnibus trait malleability scale predicted participants' inferences better *partly* due to shared method variance between the two sets of measures. However, it is unlikely that shared method variance could completely account for large difference in predictive utility between the two measures.

Table 4
Probability judgments as a function of priming and inference type (Study 2)

| Inference type | Priming | |
|--|---------|-------------|
| | Entity | Incremental |
| Predicting trait-relevant behaviors from traits | 77.2 | 75.4 |
| Inferring traits from trait-relevant behaviors | 69.6 | 64.6 |
| Predicting cross-situational consistency of trait-relevant behaviors | 67.6 | 62.2 |
| Predicting temporal stability of traits | 71.5 | 68.1 |

(inference type) mixed-model ANOVA with the second factor varied within participants. Table 4 displays the means of this analysis. As predicted, participants who received the entity prime generally made more confident dispositional judgments than did those who received an incremental prime ($M_s = 71.4\%$ vs. 67.6%), $F(1, 102) = 7.35$, $MSE = 212.47$, $p < .01$.³ This finding is consistent with the idea that clusters of entity and incremental knowledge co-exist within an individual, and that momentary variations in their relative accessibility affect one's proclivity for lay dispositionism.

As in Study 1, participants made more confident dispositional judgments from a person's traits ($M = 76.3\%$ when predicting trait-relevant behaviors from traits; $M = 69.8\%$ when predicting temporal stability of traits) than from trait-relevant behaviors ($M = 64.9\%$ when predicting cross-situational consistency of trait-relevant behaviors; $M = 67.1\%$ when inferring traits from trait-relevant behaviors), $F(3, 306) = 39.82$, $MSE = 63.89$, $p < .001$. Inference type did not interact with priming to influence judgments, $F(3, 306) = .35$, $MSE = 63.89$, ns .

General belief ratings

As one would expect if each of the core person theories is loosely connected with other consistent pieces of knowledge, participants expressed a stronger general belief that personality cannot change after receiving an entity prime than after receiving an incremental prime [$M_s = 4.23$ vs. 3.33 ; $1 = \text{can always change}$; $9 = \text{cannot change}$; $F(1, 102) = 7.83$, $MSE = 2.71$, $p < .01$].

³ Our main focus was on how the relative accessibility of entity versus incremental knowledge, as affected by the priming manipulation, influenced participants' dispositional inferences. Thus, comparing judgments between the entity- and incremental-prime conditions is sufficient for testing our hypothesis. However, having a baseline condition could provide additional information about the locus of the observed priming effect. Study 1 could be used as a proxy baseline condition, as there was no experimental manipulation and the dispositional judgment questionnaire used was the same as Study 2. In doing so, we found that the mean judgment of the entity-prime condition fell at the 62nd percentile and the mean judgment of the incremental-prime condition fell at the 44th percentile of all the judgments (averaged across inference types per participant) in Study 1. This observation suggests that our entity prime had a dispositionist-elevating effect and our incremental prime had a dispositionist-reducing effect.

Within each priming condition, participants' post-priming general belief ratings did not significantly correlate with their overall dispositional judgments ($r = -.07$ in the entity-prime condition; $r = .18$ in the incremental-prime condition). In light of this result, it is not surprising that the effect of priming on dispositional judgments remained significant even when the general belief ratings were included as a covariate, $F(1, 101) = 6.09$, $MSE = 214.03$, $p < .05$. Thus, participants' dispositional inferences appeared to be influenced by both general and specific knowledge made relatively more accessible by the priming task, in a manner that was not fully captured by its impact on the general beliefs they expressed towards the end of the experimental session.

Content of explanations

Coding scheme. Participants' open-ended explanations of why Hermann's personality remained unchanged (or changed a lot) allow us to identify the contents of lay knowledge supporting an entity (or incremental) personality theory. Their explanations were analyzed in terms of the relative weight they accorded to three information categories relevant for person perception: (1) *trait information*, including personality traits and such context-free dispositions as intelligence and morality; (2) *process information*, specific psychological states that mediate behavior or outcomes, such as context-specific goals, construals, and moods; and (3) *situational information*, contextual factors affecting a person's behavior. For coding purposes, participants' responses were segmented into units corresponding to each clause. Irrelevant units were then identified. Reiterations of the explanation question, personal reactions to the biographies which were unrelated to the explanation question, and units that did not fit into any of the three information categories were deemed irrelevant. Two raters were given transcriptions of participants' entire responses with units demarcated and numbered (cf. Morris & Peng, 1994). Relevant units were indicated on the coding sheets. There were 439 relevant units across the two priming conditions. The raters, who were blind to the experimental conditions associated with the responses, independently coded each relevant unit as falling into one of the three information categories. Examples of each category of information appear in Table 5. The inter-rater reliability of the coding was acceptable (Cohen's $\kappa = .70$; proportion of inter-rater agreement before Cohen's correction for chance = .80).

Differences in social information use across priming conditions. For each participant, the number of units coded into each of the three information categories was tallied from each rater's rating, and then averaged across the two raters. The averaged frequency counts were submitted to a 2 (priming) \times 3 (information category) mixed-model ANOVA, with the second factor varied

Table 5
Examples of trait, process, and situational information in participants' explanations in each priming condition (Study 2)

| Social information category and priming condition | Example |
|---|--|
| Trait | |
| Entity-prime | "... because he was shy" |
| Incremental-prime | "Hermann changed from being an introvert to an extrovert." |
| Process | |
| Entity-prime | "Completing his research and finding the truth obviously made Hermann happy" |
| Incremental-prime | "... because his goals changed" |
| Situation | |
| Entity-prime | "His parents never really socialized him as a child." |
| Incremental-prime | "The environment around him changed from time to time." |

Table 6
Use of different categories of social information in each priming condition (Study 2)

| Priming | Social information category | | |
|-------------|-----------------------------|---------|-----------|
| | Trait | Process | Situation |
| Entity | 2.81 | .36 | .64 |
| Incremental | .69 | 2.19 | 1.75 |

Note. Numbers in table represent mean number of units coded into each information category per participant.

within participants. Table 6 displays the mean frequency for each cell. This analysis yielded a significant Priming \times Information Category interaction, $F(2, 204) = 49.92$, $MSE = 2.30$, $p < .001$. Relative to participants in the entity-prime condition, those in the incremental-prime condition focused less on traits [$t(102) = -7.38$, $p < .001$], and more on psychological processes [$t(102) = 6.43$, $p < .001$] and situations [$t(102) = 3.70$, $p < .001$] (see Table 6).

Discussion

We hold that the main effect of our priming procedures on dispositional judgments was due to differential activation of entity and incremental knowledge. An alternative interpretation is that participants determined that presentation of the biography was intended to influence their dispositional judgments, and that they adjusted their judgments accordingly to meet the experimenter's expectations. We think this interpretation is unlikely. The biography was included among several filler items as part of an allegedly unrelated reading comprehension study. The "unrelated studies" design has been used widely and with considerable success in social cognition and other areas of research. Because the content of the biography was manipulated between participants, furthermore, it would be difficult for a given

participant to determine which aspects of the biography were supposed to influence their later judgments, which focused at least as much on situational instability as temporal instability in traits or trait-relevant behavior. If anything, the judgment task would be expected to draw participants' attention to differences between inference types or between traits; it is not apparent how the biography would be seen as being relevant to either type of difference. The account we offer, in which the priming manipulation affected the relative activation of entity and incremental knowledge that in turn influenced the confidence with which dispositional judgments were made, would seem to be a more straightforward interpretation of the results.

Our content analysis of participants' explanations suggests differences in the composition of social information supporting two opposing views about personality. An entity theory seems to be supported mainly by trait information, and to a lesser extent by process and situational information, as shown in explanations of why Hermann remained unchanged. By contrast, an incremental theory appears to be supported primarily by information about psychological states and situations, and only secondarily by trait information, as seen in explanations of Hermann's personality changes throughout his life. Although knowledge used in participants' explanations in either priming condition might only be a subset of knowledge activated by the priming procedure, the content of their explanations might very well reflect their information focus when they made social predictions or inferences, given the conceptual link between explanation and prediction. Participants in the entity-prime condition might have focused on traits when making inferences, whereas those in the incremental-prime condition on psychological states and situations. Such differences in inferential frame might underlie the effect of priming on dispositional inferences.

Our content analysis empirically corroborates Chiu et al.'s (1997) claim that it is the differential focus on traits versus psychological states and situations by entity and incremental theorists that gives rise to differences in their tendency to subscribe to inferential practices associated with lay dispositionism (see also Levy, Plaks, Hong, Chiu, & Dweck, 2001). More importantly, this study suggests that an individual may not always perceive the social world using the same mental frame. Instead, one's inferential frame may shift when certain pieces of existing knowledge become more easily retrievable.

Study 3

To ascertain the generality of the findings in Study 2, this study used a different priming procedure to activate participants' existing entity and incremental

knowledge. As detailed below, we used proverbs as a basis of our priming manipulation because interpretations of these pithy sayings rely on existing folkloristic or experiential knowledge. Indeed, because of this property, proverbs have been used by researchers to prime other kinds of stored knowledge (e.g., Trope & Gaunt, 2000). Any lingering doubts that the results of the previous study are in some way attributable to participants having discerned and complied with the experimenter's expectation that the priming manipulation would influence their later dispositional judgments should be resolved in Study 3's use of the proverbs task, which would seem to be an even more subtle priming manipulation than the biography task used in Study 2.

Method

Introductory psychology students ($n = 111$) were invited to participate in two allegedly unrelated studies. The first study was referred to as a *study of proverbs in everyday life*, in which the task was to answer questions about three proverbs. Participants were randomly assigned to one of the two priming conditions. In the *entity-prime condition*, the proverbs were consistent with the notion that personality is fixed ("You cannot teach an old dog new tricks"; "Old habits die hard"; "A leopard cannot change its spots"). In the *incremental-prime condition*, the proverbs were consistent with the notion that personality is malleable ("It is never too late to learn"; "Experience is the best teacher"; "When in Rome, do as the Romans do"). For each proverb, participants were asked to rate their familiarity with its meaning on a 6-point scale (1 = *not at all familiar*; 6 = *very familiar*), explain its meaning, and describe three situations to which it could be applied. They were also asked to indicate the initials of the first person who came to mind when thinking about the proverb, and to describe how that person exemplifies its meaning.

The procedure following the priming manipulation was identical to Study 2. We added two forced-choice questions at the end of the dispositional inference questionnaire to check whether participants' interpretations of the endpoints (0 and 100%) and the midpoint (50%) of the probability scale were consistent with our intended meaning.

Two participants who were suspicious of the link between the two parts of the experimental session were excluded from data analysis. One participant who had heard about our study and another who reported feeling annoyed by it were also excluded. Four additional participants were excluded because they misinterpreted our intended meaning of a 50% rating on the dispositional inference task, leaving 103 participants in the following analyses.

Results

Familiarity with proverbs

We averaged each participant's familiarity ratings for the three proverbs in his or her condition. The resultant familiarity scores did not differ across priming conditions, $t(101) = .18$, *ns*. The proverbs in both conditions were rated as familiar ($M_s = 4.51$ vs. 4.47 for the entity- and incremental-prime conditions respectively; 1 = *not at all familiar*, 6 = *very familiar*). Indeed, most participants were able to explain their meanings, give examples of situations to which they can be applied, and provide illustrations using their memories of other people.

Dispositional judgments

We averaged each participant's probability judgments for all 30 items within each inference type. The resultant scores were submitted to a 2 (priming) \times 4 (inference type) mixed-model ANOVA with the second factor varied within participants. Table 7 displays the means of this analysis. As in Study 2, participants who received an entity prime generally made more confident dispositional judgments than did those who received an incremental prime ($M_s = 70.0\%$ vs. 66.1%), $F(1, 101) = 6.24$, $MSE = 254.39$, $p < .05$.⁴ The effect of the priming manipulation remained significant after controlling for the proverb familiarity ratings, $F(1, 100) = 6.19$, $MSE = 256.9$, $p < .05$. This finding again is consistent with the idea that clusters of entity and incremental knowledge co-exist within an individual, and that variations in their relative accessibility influence one's propensity for lay dispositionism.

As in Studies 1 and 2, participants made stronger dispositional inferences from a person's traits ($M = 73.8\%$ when predicting trait-relevant behaviors from traits; $M = 68.5\%$ when predicting temporal stability of traits) than from trait-relevant behaviors ($M = 65.5\%$ when predicting cross-situational consistency of trait-relevant behaviors; $M = 64.5\%$ when inferring traits from trait-relevant behaviors), $F(3, 303) = 44.49$, $MSE = 40.41$, $p < .001$. Inference type did not interact with the priming

⁴ Again, our focus was on how the relative accessibility of entity versus incremental knowledge, as affected by priming, influenced participants' dispositional inferences. Comparing judgments between the entity- and incremental-prime conditions is adequate for our purpose. Nonetheless, we could use Study 1 as a proxy baseline condition to obtain additional information about the locus of the observed priming effect. In doing so, we found that the mean judgment of the entity-prime condition fell at the 57th percentile and the mean judgment of the incremental-prime condition fell at the 40th percentile of all the judgments (averaged across inference types per participant) in Study 1. This observation suggests that our entity prime had a dispositionist-elevating effect and our incremental prime had a dispositionist-reducing effect.

Table 7
Probability judgments as a function of priming and inference type (Study 3)

| Inference type | Priming | |
|--|---------|-------------|
| | Entity | Incremental |
| Predicting trait-relevant behaviors from traits | 75.8 | 71.8 |
| Inferring traits from trait-relevant behaviors | 66.3 | 62.6 |
| Predicting cross-situational consistency of trait-relevant behaviors | 67.5 | 63.5 |
| Predicting temporal stability of traits | 70.4 | 66.5 |

manipulation to influence dispositional judgments, $F(3, 303) = .01$, $MSE = 40.41$, *ns*.

General belief ratings

As one would predict if each of the core person theories is loosely linked to other consistent pieces of knowledge, participants expressed a stronger belief that personality cannot change after receiving an entity prime than after receiving an incremental prime [$M_s = 4.49$ vs. 3.48 ; $1 = \textit{can always change}$; $9 = \textit{cannot change}$; $F(1, 101) = 7.85$, $MSE = 3.34$, $p < .01$].

As in Study 2, within each priming condition, participants' post-priming general belief ratings did not significantly correlate with their overall probability judgments ($r = .06$ in the entity-prime condition; $r = .20$ in the incremental-prime condition). Given this result, it is not surprising that the effect of priming on probability judgments remained significant even when the general belief ratings were used as a covariate, $F(1, 100) = 4.27$, $MSE = 252.73$, $p < .05$. Again, participants' dispositional inferences seemed to be affected by both general and specific knowledge made relatively more accessible by the priming task, the impact of which was not entirely reflected in the general beliefs they expressed towards the end of the experimental session.

Discussion

The priming tasks in Studies 2 and 3 invoked the use of different aspects of lay knowledge. In Study 2, participants could use their causal schemas when explaining why Hermann's personality remained unchanged or changed a lot across his lifespan. In Study 3, they could rely on semantic memory when explaining the meaning of proverbs, and episodic memory when illustrating their meanings through their everyday experience. Seemingly disparate pieces of knowledge possessed by an individual may be organized in such a way that some cluster around the notion that personality is fixed and some around the notion that personality is malleable, enabling the kind of spreading activation that produced parallel results across the two studies.

General discussion

Motivated by our finding that temporal instability of person theories can considerably attenuate their long-term predictive validity (Poon & Koehler, 2005), we suggest that the individual-differences approach prevalent in the literature does not adequately capture dynamic relations between lay personality knowledge and dispositional judgments. Following Dweck and colleagues' suggestion that lay theories research may benefit from pursuing the implications of a knowledge-activation framework (Dweck et al., 1995b), we have explicated the content and processes of a knowledge-activation conceptualization from which specific hypotheses regarding inter- and intra-individual variations in knowledge states and their implications for dispositional judgments can be derived. The studies we have reported empirically evaluate aspects of this conceptualization.

First, this work affirms the incremental value of incorporating relatively specific pieces of knowledge (e.g., ideas about particular traits, factors affecting personality, and memories of specific individuals) in theorizing about laypeople's social thinking. In Study 1, trait-specific malleability beliefs predicted inter-individual variations in dispositional judgments better than general malleability beliefs. Trait-specific beliefs also predicted intra-individual variations in dispositional judgments among traits, which would remain unaccounted for had we only measured participants' general beliefs. In Studies 2 and 3, the effect of the priming manipulations on participants' dispositional judgments remained significant even when their post-priming general belief ratings were controlled. Participants might have used both general and specific knowledge made relatively more accessible by the priming tasks when making dispositional judgments, instead of relying exclusively on their general beliefs.

Second, and more important, this research provides evidence that most people possess both entity and incremental knowledge, and that operation of such knowledge may follow principles known to govern activation and use of other kinds of social knowledge. In Studies 2 and 3, we demonstrate knowledge accessibility effects on dispositional judgments through fairly subtle priming manipulations that utilized aspects of participants' existing knowledge. Specifically, when entity (incremental) knowledge was made relatively more accessible by recent priming, participants exhibited more (less) confident dispositional judgments.

From a knowledge-activation perspective, the finding that priming procedures in Studies 2 and 3 influenced participants' post-priming expressed beliefs about the malleability of personality can help account for the naturally-occurring temporal instability in person theories observed by Poon and Koehler (2005). One can readily identify everyday experiences

conceptually analogous to our priming procedures. Examples include trying to making sense of the changes (or lack thereof) in the personality of a friend (cf. Study 2), and exposure to proverbs and other culturally shared notions of human nature in conversations or other communicative contexts (cf. Study 3). These everyday occurrences may produce idiosyncratic variations in the accessibility of entity versus incremental knowledge, which manifest as temporal instability in person theories.

We hope that our findings will instigate further explorations of the wide-ranging empirical implications afforded by a knowledge-activation conceptualization. While the relative accessibility of entity versus incremental knowledge was manipulated through prior activation in Studies 2 and 3, future research may explore other determinants of accessibility, such as the perceiver's goal. It has been suggested that, relative to incremental theorists, entity theorists tend to hold an evaluative goal (i.e., goal of judging whether someone is good or bad) when processing person information (Dweck, 1996; Hong, Chiu, Dweck, & Sacks, 1997). Whether activating an evaluative goal will increase the relative accessibility of entity knowledge awaits investigation. Another intriguing direction for future research concerns factors that moderate the impact of accessible personality knowledge. Previous research on other kinds of social knowledge suggests that the use of relatively accessible constructs tends to increase under high need for closure (e.g., Ford & Kruglanski, 1995). Yet, if accessible knowledge is judged to be irrelevant, its use in social judgments may be inhibited (Higgins, 1996). Whether similar principles apply to relatively accessible entity or incremental knowledge remains to be tested.

Investigations along these lines will enrich lay knowledge research, which has largely focused on the implications of inter-individual variations in person theories at a particular moment. As noted, within-person variations in knowledge accessibility, as implicated by temporal instability in person theories reported by Poon and Koehler (2005), can be accounted for. Furthermore, chronic individual differences may be explained by examining stable factors affecting knowledge activation and use (e.g., prolonged contextual activation, chronically high need for closure). In this article, we simply assume that chronic and relatively temporary sources of accessibility combine additively. Yet, their precise relationship remains to be tested. Future research may examine whether individuals with a chronically *large discrepancy* in the accessibility of entity versus incremental knowledge and those with a chronically *small discrepancy* respond differently to priming procedures designed to increase activation of their chronically less accessible knowledge cluster.

Relation to the cultural cognition literature

Conceptually, the present framework is akin to the *dynamic constructivist approach* to the study of cultural cognition, which similarly uses knowledge-activation principles to depict the influence of culturally-conferred knowledge on social thinking (Hong et al., 2000). The most significant contribution of this approach is that it can explain how the relative influence of different cultural theories varies *within* bi-cultural or multi-cultural individuals (i.e., individuals who have internalized two or more cultures) across situations and time. Paralleling the priming studies in our research, Hong et al. showed that bi-cultural individuals (e.g., Westernized Hong Kong Chinese) switch between inferential frames as situational cues (e.g., cultural icons) affect the relative accessibility of their cultural theories.

Growing evidence suggests that East Asians are less inclined to subscribe to inferential practices indicative of lay dispositionism than are North Americans, at least when situational information is salient (Choi & Nisbett, 1998; Morris & Peng, 1994; Norenzayan, Choi, & Nisbett, 2002). Can a knowledge-activation framework account for such cross-cultural differences? Su et al. (1999) propose that differences between American and Chinese social structures foster cultural differences in theories about the social world and about individuals. Specifically, American society conforms more closely to the *Structure Accommodates Individual* model, in which individuals are expected to maintain their unique attributes, as they are placed in positions that match their needs and skills. In contrast, Chinese society conforms more closely to the *Individual Accommodates Structure* model, in which individuals are assigned to pre-specified groups and to roles and are obliged to perform role-prescribed duties. With such differences, it is suggested that, compared to Chinese individuals, Americans more strongly believe in the fixedness of personal attributes and the fluidity of the social world. From a knowledge-activation perspective, chronic cross-cultural differences in the relative accessibility of entity versus incremental knowledge about individuals and about the social world may contribute to the aforementioned cultural differences in lay dispositionist thinking.

Implications for other facets of social cognition and beyond

Laypeople's knowledge about the malleability of personality has implications for a rich set of social-cognitive phenomena associated with lay dispositionism, beyond the four types of dispositional inferences examined in this research. For example, past research suggests that, compared to incremental theorists, entity theorists more eagerly seek out and rely more heavily on potentially trait-relevant information when making social decisions

(e.g., deciding whether a defendant is guilty in a fictitious murder case) (Gervey et al., 1999). Also, entity theorists make more extreme stereotypical trait judgments of social groups than do incremental theorists (Levy et al., 1998). The current work suggests the possibility that the tendency to rely on trait information in making social decisions and to assign stereotypical traits to social groups may vary within an individual perceiver as well, depending on factors influencing the relative accessibility of the perceiver's entity versus incremental knowledge.

The current research shows that when entity knowledge is relatively more accessible, people exhibit greater confidence in inferences involving traits (or dispositions). Yet, social inferences do not always involve traits. For instance, people may predict a concrete behavior based on situations and psychological states (e.g., Alex is heading to a job interview. He is worried that he will be late. Will he help a stranger who asks for directions?). The present framework predicts that this kind of inference will be made with greater confidence when *incremental* knowledge is relatively more accessible. This prediction remains to be tested.

The present framework of lay personality knowledge has potentially rich links with other well-researched theoretical models and implications beyond social cognition. In particular, some researchers (e.g., Anderson, 1995; Graham, 1995; Sorrentino, 1995) have linked the entity-incremental dimension of personality to dimensions of causal attributions identified earlier by Weiner (1985), including *locus* (whether a cause is internal or external to a person), *stability* (whether a cause is constant or varying over time), and *controllability* (whether a cause is under volitional control). An entity theorist who attributes a personal or social outcome (e.g., success or failure to achieve a particular goal) to a fixed trait may be seen as attributing the outcome to an internal, stable, and uncontrollable cause. Different attribution styles are associated with a wide array of emotional and behavioral correlates (for a review, see Weiner, 1985; Weiner & Graham, 1999), and so are different person theories (for a review, see Dweck & Leggett, 1988; Dweck et al., 1995a). In Dweck et al.'s (1995b) view, person theories give rise to different attribution styles. Future research based on a knowledge-activation perspective may systematically explore how different attribution styles are allied with the networks of entity and incremental knowledge, and how relative activation of particular knowledge networks impact one's emotional and behavioral responses to personal and social outcomes (cf. Dweck et al., 1995b).

Clinical relevance

Clinical psychologists sometimes conduct personality assessments using interview and questionnaire data, the

interpretations of which often involve trait inferences. A patient judged to exhibit certain traits (e.g., conscientious, controlling, orderly, and rigid) to an excessive degree may receive a personality disorder diagnosis (e.g., obsessive-compulsive personality), which may be used to understand his or her difficulties. Assessment of personality (disorders) is often criticized for its low reliability (e.g., Perry, 1992). According to the present framework, chronic differences in the relative accessibility of entity versus incremental knowledge among clinicians may explain some of the inter-rater variance. Variations in knowledge accessibility within the same clinician across time and situations may constitute another source of unreliability.

On the intervention front, instilling in patients hope that they can change (improve) is often seen as a core task in psychotherapy. Indeed, evidence based on non-patient samples suggests that incremental self-theorists tend to show more constructive behavioral and emotional responses to life challenges than do entity self-theorists (Beer, 2002; Dweck, 1999). Related to this evidence is the demonstrated success of attribution re-training programs in increasing achievement motivation and enhancing academic performance of college students who experience academic setbacks at the time of intervention. These attribution re-training programs directly communicate to students that their academic setbacks are due to unstable causes (see, e.g., Van Overwalle & De Metsenare, 1990; Wilson & Linville, 1985). To the extent that being an incremental theorist is beneficial, it might be worth exploring in future research the therapeutic value of raising the relative accessibility of patients' existing incremental self-knowledge (i.e., knowledge supporting the view that positive self-change is possible).

References

- Anderson, C. A. (1995). Implicit theories in broad perspective. *Psychological Inquiry*, 6, 286–289.
- Beer, J. S. (2002). Implicit self-theories of shyness. *Journal of Personality and Social Psychology*, 83, 1009–1024.
- Chiu, C., Hong, Y., & Dweck, C. S. (1997). Lay dispositionism and implicit theories of personality. *Journal of Personality and Social Psychology*, 73, 19–31.
- Chiu, C., Morris, M. W., Hong, Y., & Menon, Y. (2000). Motivated cultural cognition: The impact of implicit cultural theories on dispositional attribution varies as a function of need for closure. *Journal of Personality and Social Psychology*, 78, 247–259.
- Choi, I., & Nisbett, R. E. (1998). Situational salience and cultural differences in the correspondence bias and actor-observer bias. *Personality and Social Psychology Bulletin*, 24, 949–960.
- Dunning, D., Griffin, D. W., Milojkovic, J., & Ross, L. (1990). The overconfidence effect in social prediction. *Journal of Personality and Social Psychology*, 58, 568–581.
- Dweck, C. S. (1996). Implicit theories as organizers of goals and behavior. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 69–90). New York: The Guilford Press.

- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. PA: Psychology Press.
- Dweck, C. S., Chiu, C., & Hong, Y. (1995a). Implicit theories and their role in judgment and reactions: A world from two perspectives. *Psychological Inquiry*, 6, 267–285.
- Dweck, C. S., Chiu, C., & Hong, Y. (1995b). Implicit theories: Elaboration and extension of the model. *Psychological Inquiry*, 6, 322–333.
- Dweck, C. S., Hong, Y., & Chiu, C. (1993). Implicit theories: Individual differences in the likelihood and meaning of dispositional inference. *Personality and Social Psychology Bulletin*, 19, 644–656.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Journal of Personality and Social Psychology*, 95, 256–273.
- Erdley, C. A., & Dweck, C. S. (1993). Children's implicit personality theories as predictors of their social judgments. *Child Development*, 64, 863–878.
- Ford, T. E., & Kruglanski, A. W. (1995). Effects of epistemic motivations on the use of accessible constructs in social judgment. *Personality and Social Psychology Bulletin*, 21, 950–962.
- Gervery, B. M., Chiu, C., Hong, Y., & Dweck, C. S. (1999). Differential use of person information in decisions about guilt versus innocence: The role of implicit theories. *Personality and Social Psychology Bulletin*, 25, 17–27.
- Gidron, D., Koehler, D. J., & Tversky, A. (1993). Implicit quantification of personality traits. *Personality and Social Psychology Bulletin*, 19, 594–604.
- Gilbert, D. T., & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin*, 117(1), 21–38.
- Graham, S. (1995). Implicit theories as conceptualized by an attribution researcher. *Psychological Inquiry*, 6, 294–297.
- Heyman, G. D., & Dweck, C. S. (1998). Children's thinking about traits: Implications for judgment of self and others. *Child Development*, 64, 391–393.
- Higgins, E. T. (1989). Knowledge accessibility and activation: Subjectivity and suffering from unconscious sources. In J. S. Ulman & J. A. Bargh (Eds.), *Unintended thought: The limits of awareness, intention, and control* (pp. 75–123). NY: Guilford.
- Higgins, E. T. (1996). Knowledge activation: accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). NY: The Guilford Press.
- Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141–154.
- Hong, Y., Chiu, C., Dweck, C. S., & Sacks, R. (1997). Implicit theories and evaluative process in person cognition. *Journal of Experimental Social Psychology*, 33, 296–323.
- Hong, Y., Morris, M. W., Chiu, C., & Benet-Martinez, V. (2000). Multi-cultural minds: A dynamic constructivist approach to culture and cognition. *American Psychologist*, 55, 709–720.
- Jones, E. E. (1979). The rocky road from acts to dispositions. *American Psychologist*, 34, 107–117.
- Koehler, D. J. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin*, 110, 499–519.
- Kruglanski, A. W. (1995). Implicit theory as a theory of personality. *Psychological Inquiry*, 6, 301–304.
- Kunda, Z., & Nisbett, R. E. (1986). The psychometrics of everyday life. *Cognitive Psychology*, 18, 195–224.
- Levy, S. R., Plaks, J. E., Hong, Y., Chiu, C., & Dweck, C. S. (2001). Static versus dynamic theories and the perception of groups: Different routes to different destinations. *Personality and Social Psychology Review*, 5, 156–168.
- Levy, S. R., Stroessner, S. J., & Dweck, C. S. (1998). Stereotype formation and endorsement: The role of implicit theories. *Journal of Personality and Social Psychology*, 74, 1421–1436.
- Morris, M. W., Ames, D. R., & Knowles, E. D. (2001). What we theorize when we theorize that we theorize: Examining the “implicit theory” construct from a cross-disciplinary perspective. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the Legacy and Future of Social Cognition* (pp. 143–161). NJ: Erlbaum.
- Morris, M. W., & Peng, K. (1994). Culture and cause: American and Chinese attributions for social and physical events. *Journal of Personality and Social Psychology*, 67, 949–971.
- Norenzayan, A., Choi, I., & Nisbett, R. E. (2002). Cultural similarities and differences in social inference: Evidence from behavioral predictions and lay theories of behavior. *Personality and Social Psychology Bulletin*, 28, 109–120.
- Pedhazur, E. J. (1982). *Multiple regression in behavioral research: Explanation and prediction* (2nd ed.). Rinehart and Winston, NY: Holt.
- Perry, J. C. (1992). Problems and considerations in the valid assessment of personality disorders. *American Journal of Psychiatry*, 149, 1645–1653.
- Poon, C. S. K., & Koehler, D. J. (2005). Person theories: Their instability and relation to inter-trait inferences. Unpublished manuscript, University of Waterloo, Ontario, Canada.
- Ross, L., & Nisbett, R. E. (1991). *The person and the situation: Perspectives of social psychology*. NY: McGraw Hill.
- Ross, M. (1989). Relation of implicit theories to the construction of personal histories. *Psychological Review*, 96, 341–357.
- Rothbart, M., & Park, B. (1986). On the confirmability and disconfirmability of trait concepts. *Journal of Personality and Social Psychology*, 50, 131–142.
- Schuerger, J. M., Zarrella, K. L., & Hotz, A. S. (1989). Factors that influence the temporal stability of personality by questionnaire. *Journal of Personality and Social Psychology*, 56, 777–783.
- Sinclair, L., & Kunda, Z. (1999). Reactions to a Black professional: Motivated inhibition and activation of conflicting stereotypes. *Journal of Personality and Social Psychology*, 77, 885–904.
- Sorrentino, R. M. (1995). A world from two perspectives: E Pluribus Duo? *Psychological Inquiry*, 6, 314–318.
- Su, S., Chiu, C., Hong, Y., Leung, K., Peng, K., & Morris, M. W. (1999). Self-organization and social organization: US and Chinese constructions. In T. R. Tyler, R. M. Kramer, & O. P. John (Eds.), *The psychology of the social self* (pp. 193–222). New Jersey: Erlbaum.
- Trope, T., & Gaunt, R. (2000). Processing alternative explanations of behavior: Correction or integration? *Journal of Personality and Social Psychology*, 79, 344–354.
- Van Overwalle, F., & De Metsenaere, M. (1990). The effects of attribution-based intervention and study strategy training on academic achievement in college freshmen. *British Journal of Educational Psychology*, 60, 299–311.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548–573.
- Weiner, B., & Graham, S. (1999). Attribution in personality psychology. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theories and research* (pp. 605–628). NY: The Guilford Press.
- Wilson, T. D., & Linville, P. W. (1985). Improving the performance of college freshman with attributional techniques. *Journal of Personality and Social Psychology*, 49, 287–293.