Lay Theories of Personality: Cornerstones of Meaning in Social Cognition

Jason E. Plaks[1]*, Sheri R. Levy[2] and Carol S. Dweck[3]
[1] *University of Toronto*
[2] *Stony Brook University*
[3] *Stanford University*

Abstract

Lay theories (or 'implicit theories') are cornerstones for social cognition: people use lay theories to help them make sense of complex and ambiguous behavior. In this study, we describe recent research on the entity and incremental theories (the belief that personality is fixed or malleable). In so doing, we demonstrate that each theory does not act alone. Instead, each is associated with a set of allied beliefs, the sum total of which cohere into two distinct *meaning systems*. We present evidence that these meaning systems produce systematic differences in a range of fundamental social cognition processes, with important implications for the field's understanding of trait/situation attribution, moral judgment, person memory, and stereotyping. We further argue that because meaning systems serve a central meaning-making function, people are motivated to believe that the meaning system they are using is effective and accurate. Accordingly, we present evidence that people exhibit processing distortions and compensatory mechanisms to minimize the impact of information that violates their meaning system. We discuss the implications of these findings for the field's understanding of basic social cognition.

Considering the staggering complexity of human behavior, it is remarkable how effortlessly people seem to decode the actions of others. Much of this work is accomplished behind the scenes by the network of lay beliefs or 'theories' about human nature that people bring with them to the task of social perception (e.g. Hong, Levy, & Chiu, 2001; Levy, Chiu, & Hong, 2006; Molden & Dweck, 2006). Lay theories (also referred to as 'implicit theories', 'naïve theories', and 'folk theories') have been defined as both *ontological assumptions* (beliefs about what is true in the world) and *narrative representations* (frameworks that explain and organize the world) (Levy, Chiu, & Hong, 2006). They differ from other meaning-making structures such as 'attitudes' and 'values' in that the latter two are, by definition, evaluative or prescriptive. Lay theories, in contrast, may be prescriptive or descriptive. Their primary purpose is to facilitate the understanding of complex information (Heider, 1958; Kelly, 1955; Piaget et al., 1983). Indeed, without basic working theories about human nature operating in the background, it is difficult to see how people could begin to make sense of the human behavior they observe (e.g. Levy, Chiu, & Hong, 2006; Molden & Dweck, 2006).

It has been only relatively recently, however, that researchers in social cognition have begun to document systematically what these lay theories might be and how they might affect social perception and cognition. Research on lay theories has identified several fundamental types of theories that play a significant role in the perception of individuals and groups. For example, some research has focused on the implicit assumptions about causality (e.g. Morris & Larrick, 1995) and intentionality (e.g. Malle & Knobe, 1997) that underlie basic attributional reasoning. Other research has focused on assumptions about

particular groups, as in the work on group 'essence' (e.g. Haslam & Whelan, 2008; Yzer-byt, Rocher, & Schadron, 1997) and 'entitativity' (e.g. Ip, Chiu, & Wan, 2006). Still other research has focused on metacognitive theories about, for example, what constitutes sufficient grounds to judge someone (Yzerbyt, Schadron, Leyens, & Rocher, 1994).

In this article, we do not set out to present an exhaustive review of the research on lay theories and social cognition. Instead, we focus on one particularly potent class of beliefs regarding the *fixedness* or *malleability* of traits. We will show that where an individual's theory falls on this fixed–malleable dimension is a powerful predictor of how he/she will encode, integrate, retrieve, and explain people's behavior. Whereas much of the extant literature on lay theories and social perception has focused on beliefs about the nature of particular individuals or groups, our approach focuses on beliefs about the nature of people in general. This means, for example, that individuals may be prone to stereotyping not simply because of their beliefs about a particular group, but because of their broader theory about how human personality works.

In comparing those with a fixed belief (an 'entity theory') and those with a malleable belief (an 'incremental theory'), we will present evidence that each theory does not act alone. Rather, people with an entity theory tend to hold a network of other specifiable beliefs that they believe are implied by the core belief; people with an incremental theory hold a different set of beliefs based on *their* core belief. We will describe how these constellations of allied beliefs cohere into structured *meaning systems* that help individuals to construct a rich understanding of a person's behavior, even on the basis of minimal observed behavior. Finally, we will present data demonstrating that these meaning systems are so central to basic social perception that when they are threatened, people react defensively and promptly take steps to repair the damage incurred to their sense that they understand human behavior.

Theories of a Stable Versus Dynamic Human Nature

One of the most basic questions a scientist would ever want to ask about his/her object of study is, 'Is it stable or dynamic?' That is, is it likely to remain as is or might it undergo a significant change? This fundamental question has found expression in scientific fields ranging from physics, to genetics, to neuroscience. In each case, prevailing views of the object of study (matter, genes and their expression, the brain) as relatively stable and unchanging have evolved over time to a view of the object as dynamic and ever-changing. These evolving conceptions have ushered in novel implications for how to predict and explain basic phenomena in each field. For 'lay social scientists', the object of study is other people, but the question remains the same: Are people generally fixed or malleable? Given the adaptive importance of forming basic working assumptions about human behavior, it is not surprising that around 80% of the participants in our samples (including both college students and elementary school students) are able to express a clear opinion about whether human personality is fixed or malleable.

The entity theory refers to the belief that personality characteristics are fixed entities despite a person's efforts or motivation to change them. The incremental theory refers to the belief that personality characteristics are malleable and can be developed with time and effort. In our research with adults, an individual's general preference for the entity or incremental theory is measured using an eight-item questionnaire. A typical entity theory item on the questionnaire is, ''Everyone is a certain kind of person, and there is not much that can be done to really change that''. A typical incremental theory item is, ''Everyone can change even their most basic qualities''. (For the complete measure and

scoring method, see Dweck, 1999.) These theories may be assessed at the general level (about personality in general) or at the more specific level (about particular traits such as intelligence or moral character). We have found that the general measure is only moderately correlated with measures tailored to specific traits. In some of our work (such as that on group stereotypes), it has been more appropriate to assess theories at the general level, while in others, it has been more appropriate to assess theories at the specific level because our interest is on how people construe a specific trait like intelligence. It should be noted that this measure does not correlate significantly with level of education, general indices of personality such as Big Five traits, political attitudes, or intelligence (Dweck, Chiu, & Hong, 1995; Spinath, Spinath, Riemann, & Angleitner, 2003). In addition, similarly conceived entity and incremental theories of personality and their correlates have been found in samples around the world, including Hong Kong (Chiu, Hong, & Dweck, 1997), Mexico (Church et al., 2003), and Norway (Silvera, Moe, & Iversen, 2000).

Although our lay theories approach can involve stable individual differences, it does not describe 'personality types'. Instead, we view lay theories as knowledge structures that follow the basic principles of knowledge activation. As such, the entity and incremental theories may be experimentally primed in the laboratory through a variety of means. These include having participants read persuasive written passages espousing either theory, having participants persuade themselves of either theory by generating autobiographical examples, and exposing participants to proverbs exemplifying either theory (e.g. Chiu, Hong, & Dweck, 1997; Levy, Stroessner, & Dweck, 1998; McConnell, 2001; Molden, Plaks, & Dweck, 2006; Plaks & Stecher, 2007; Poon & Koehler, 2006). That is, even though individuals may hold a general tendency toward one theory or the other, most people acknowledge that each theory has some element of truth to it. Thus, people may be primed to adopt either theory as their working theory, if presented with a sufficiently compelling message. In other words, consistent with the principles of construct activation (e.g. Bargh, Lombardi, & Higgins, 1988), theory manipulations generally override an individual's chronic theory, at least for the short term (e.g. Burns & Isbell, 2007). Numerous studies have shown that whether theories are measured using a questionnaire or manipulated in the laboratory, the results tend to be remarkably similar.

What are the consequences of operating from the entity perspective versus the incremental perspective for social perception? Based on dozens of published studies over the past 15 years, it appears that the differences between the entity and incremental perspective are profound. As we detail below, they tend to revolve around one central difference: the degree to which traits are used as the primary 'unit of analysis' in social cognition (e.g. Levy & Dweck, 1999; Molden, Plaks, & Dweck, 2006). The entity perspective assumes that deep-seated, cross-situational traits are key causes of an individual's behavior. From the incremental perspective, what really produces behavior (and patterns of behavior) is not so much 'what kind of person' the individual is as much as intrapsychic forces (e.g. feelings, goals, desires) at play within the actor's mind (Hong, 1994). Thus, the incremental theory promotes the use of context-sensitive psychological processes to understand and describe human behavior. (Note that from the entity perspective, even such dynamic psychological experiences have their origins in − and are thus ultimately reducible to − the individual's underlying traits.)

Given that much of basic person perception research has focused on traits as the fundamental unit of analysis in people's naïve understanding of behavior, any research documenting systematic variability in this focus would be valuable. We suggest that a good

deal of the research literature research has assumed that people generally approach the task of social understanding from the entity perspective. At the same time, other research programs have assumed that people generally adopt the incremental perspective. As we will describe, neither assumption is a safe one. Rather than assuming that 'one size fits all', we suggest that there is meaningful inter- and intrapersonal variability in the tendency to form impressions from either an entity perspective or an incremental perspective.

The Entity Versus Incremental Meaning Systems

As noted, the tendency to see personality as fixed or malleable represents only the cornerstone of a larger meaning system. Numerous studies have provided evidence that each theory works hand-in-hand with a network of allied beliefs that are used by the individual to further explicate the nuances of human behavior (Levy, Plaks, & Dweck, 1999; Molden & Dweck, 2006). We turn now to studies that (i) document some of the ancillary beliefs that accompany each theory and (ii) illustrate how these different meaning systems precipitate radically different modes of social understanding.

Fixed traits versus psychological processes cause behavior

It is conceivable a priori that although entity theorists believe that traits are fixed, the effect of these traits on behavior might be relatively small compared with the power of the situation. On the other hand, it is also conceivable that entity theorists believe that not only are traits fixed but these fixed traits are the principal causes of behavior, are consistently reflected in behavior, and can be used to predict behavior. As suggested earlier, the data from numerous studies overwhelmingly support the latter. For example, Chiu, Hong, and Dweck (1997, Study 3) provided participants with a list of behaviors that varied in their degree of moral goodness/badness, ranging from clearly positive behaviors (''risked one's life for another person'') to moderately positive (''made one's bed in the morning'') and moderately negative behaviors ''interrupted someone who was speaking'') to clearly negative behaviors (''stole a car''). Participants were asked to rate the degree to which each behavior was indicative of the actor's underlying goodness or badness. As expected, those with the entity perspective rated the behaviors significantly more indicative of the actor's underlying nature than those with the incremental perspective. Moreover, this difference held for both positive and negative behaviors. Further analyses showed that this was not because people holding an entity theory generally rated the behaviors more extremely. In other studies, those with the entity perspective made more extreme predictions about an actor's future behavior based on provided trait information (Chiu, Hong, & Dweck, 1997, Study 2) and even a single observed behavior (Chiu, Hong, & Dweck, 1997, Study 1).

In contrast, participants with an incremental theory have been found to place more stock in context-sensitive psychological processes as the principal causes of behavior. Hong (1994), for example, asked participants to give explanations for a series of actions. Analysis of the types of explanations participants generated revealed that incremental theorists were more likely than entity theorists to invoke beliefs, emotions, and goals to explain the target's behavior. Importantly, these types of causes for behavior are more amenable to the exercise of personal control (Dweck & Molden, 2008). Thus, it is not surprising that incremental theorists are greater believers in the benefits of work and toil, even in the face of failure, whereas entity theorists tend to dismiss greater effort in response to failure as largely futile (e.g. Blackwell, Trzesniewski, & Dweck, 2007; Robins & Pals, 2002).

Molden, Plaks, and Dweck (2006) took these ideas an important step further by examining implications of the trait versus process focus for basic attributional processes. Molden et al. found that it is not simply the case that entity theorists make stronger trait inferences and incremental theorists stronger situational inferences. Instead, the type of inference participants made depended on whether the situational information *discounted* or *augmented* the implied trait (Kelley, 1973). When situational information discounted the implied trait (e.g. anxious behavior, but in an anxious situation), incremental theorists' trait attributions were weakened, while entity theorists' remained firm. However, when situational information augmented the implied trait (e.g. anxious behavior in mundane situation), incremental theorists' trait attributions became more extreme than those of entity theorists. Why was this so? Incremental theorists' greater sensitivity to the situation led them to understand that behavior that conforms to a situational norm does not reveal anything special about the individual's personality, while behavior that violates a situational norm speaks directly to the individual's personality (Jones & Davis, 1965). Entity theorists, in contrast, by focusing only on the trait information, pinned the cause of the behavior on the actor's personality, regardless of what the situation might have dictated. In sum, whereas incremental theorists behaved as Kelley imagined people in general behave, entity theorists did not.

It is easy versus difficult to judge people

A second implication of starting out with an entity versus incremental belief relates to the amount of information required to form a judgment. It is conceivable that entity theorists might believe that although fixed traits are the primary causes of behavior, human behavior is so highly complex and ambiguous that it is just too difficult to extract these traits merely from observing a single behavior. On the other hand, it is also conceivable that entity theorists might believe that traits are reliably expressed in behavior. Thus, a given behavior may be taken as a good representation of the trait it implies. The data strongly support the latter. For example, Chiu, Hong, and Dweck (1997) found that, based on behavior in a single situation (e.g. Jack was friendlier than Joe), those with the entity perspective made more confident predictions than those with the incremental perspective about the actor's behavior in future situations (e.g. Jack would continue to be friendlier than Joe). In contrast, incremental theorists believe that behavior is in large measure dependent on context-sensitive psychological processes. Thus, to gain confidence about what a person is like, they require more examples before rendering a judgment (Chiu, Hong, & Dweck, 1997; Plaks, Stroessner, Dweck, & Sherman, 2001). (For conceptually related data, see McConnell, 2001.) In a different context, Butler (2000) found that adolescents with an entity theory based their evaluation of another student's ability on the initial score even when that student's performance declined or increased substantially over multiple tests of mathematic ability. Incremental theorists, in contrast, viewed the last score in the sequence as most diagnostic of the student's ability.

Wrongdoers deserve retribution versus wrongdoers deserve rehabilitation

We move now from inferences about any sort of behavior to inferences regarding moral or immoral behavior in particular. It is conceivable that entity theorists could believe that, given that traits are fixed, wrongdoers should not be judged harshly. After all, if the wrongdoer was essentially preprogrammed to act badly by his/her fixed traits, then free will was absent, implying less moral responsibility. In what may appear at first blush to be

something of a paradox, the data suggest the opposite. Entity theorists, who believe that behavior stems from sources outside of personal control, nevertheless tend to judge wrongdoers more harshly (Chiu, Dweck, Tong, & Fu, 1997) and to be more emotionally bothered by examples of immoral behavior (Miller, Burgoon, & Hall, 2007). Why is this the case? We suggest several possibilities. First, entity theorists may believe that although people are not ultimately in charge of their own actions, retributive punishment is necessary to maintain a well-functioning and law-abiding society (Chiu, Dweck, Tong, & Fu, 1997). That is, if society did not act *as if* people had free will, the very foundations of an orderly functioning community would be in jeopardy. A second possibility is that the entity theory's deterministic perspective is relaxed somewhat when it comes to acting in accord with moral principles (see Dweck & Molden, 2008). Thus, people are seen as having the capacity to control their behavior in line with societal values and norms (even if they cannot ultimately change their good or evil nature). A third possibility is that entity theorists actually do believe in the existence of free will, but that it occurs only rarely and with great effort (Dweck & Molden, 2008). Thus, even though people are highly unlikely to exercise their free agency, failure to do so does imply a moral failing.

Incremental theorists, on the other hand, conceptualize sin and punishment in terms of rehabilitation and reform (Chiu, Dweck, Tong, & Fu, 1997; Gervey, Chiu, Hong, & Dweck, 1999; Loeb & Dweck, 1994). Thus, even as they hold the wrongdoer highly responsible for his/her actions, their belief in the promise of change dictates that the next step should emphasize improving the wrongdoer rather than balancing the scales of justice. From the incremental perspective, although the wrongdoer may technically deserve to ''have the book thrown at him'', it would be better for society as a whole to focus on remaking the person into a productive citizen. (For an expanded review of these concepts, see Dweck & Molden, 2008).

These differing views on punishment versus remediation are also evident in contexts outside of moral judgment. For example, Heslin, VandeWalle and Latham (2006) found that managers with an incremental theory were more likely than those with an entity theory to offer help and coaching to underperforming employees. Analogously, in the context of romantic relationships, Kammrath and Dweck (2006) found that incremental theorists were more likely than entity theorists to confront and try to rectify their partner's transgressive behavior in a constructive manner. Finally, Karafantis and Levy (2004) found that incremental theorists (compared to entity theorists) reported greater past volunteering and greater willingness to volunteer to help the homeless. That is, believing in the possibility of change promoted greater social action.

Traits are shared versus not shared among members of a group

Thus far, our discussion of the components of the entity and incremental meaning systems has been focused on the perception of an individual. What about when the target is a group? It is conceivable that entity theorists might believe that although fixed traits are the primary contributors to an individual's behavior, there is no reason to believe that members of an ethnic or occupational group all share the same traits. On the other hand, it is also conceivable that entity theorists might believe that particular shared traits are what *define* a group; thus, they may expect less within-group variability (and significant between-group variability) with respect to core traits. Data from numerous studies support the latter.

In initial work, Levy, Stroessner, and Dweck (1998) asked participants to list all the stereotypes they knew of several ethnic groups and then to rate how true they personally

thought each stereotype was. Although entity and incremental theorists displayed similar stereotype knowledge, the entity theorists regarded the stereotypes as more true. More-over, in more recent work, efforts to stress the superordinate shared identity that exists between groups (e.g. highlighting the common 'American-ness' of Asian-Americans and African-Americans) reduced stereotyping among incremental theorists, but not entity theorists (Hong et al., 2004). Other studies have shown that these differences are not due to entity theorists generally having a more extreme or more negative view of people in general, nor are they due to differential experiences the two groups may have had with members of outgroups (Levy, Stroessner, & Dweck, 1998; Plaks, Stroessner, Dweck, & Sherman, 2001). Recent studies by Rydell, Hugenberg, Ray, and Mackie (2007) have extended this work by examining people's lay theories about the fixedness or malleability of groups (rather than individuals). Although these researchers replicated past results by showing that an entity theory about individuals predicted more stereotyping, not surpris-ingly, an entity theory about groups was an even better predictor of stereotyping. Further studies by Bastian and Haslam (2006) provided evidence that one cause for fixedness, from the entity perspective, is biological. In several studies, entity theorists were more willing than incremental theorists to endorse innate, inherent, or biological factors as the basis for applying a stereotype to all members of a group (see also Levy, Stroessner, & Dweck, 1998).

Other researchers have investigated information-processing patterns that serve to rein-force such beliefs. For example, Plaks, Stroessner, Dweck, and Sherman (2001, Study 3) presented participants with randomized lists of stereotype-consistent behavior and stereo-type-inconsistent behavior performed by different members of a group. On a later recog-nition memory test, entity theorists showed a markedly better ability to recognize the stereotype-consistent items, while incremental theorists showed no such tendency. These data suggest that entity theorists tend to encode group members' behavior in a way that screens out anomalies and promotes a clean, consistent picture of the group (Plaks, Grant, & Dweck, 2005; Plaks, Stroessner, Dweck, & Sherman, 2001; see also Skowronski, 2002). In contrast, incremental theorists appear more tolerant of within-group heteroge-neity, even in some cases shifting their attention toward stereotype-violating information, presumably due to its novelty and informativeness (Plaks, Stroessner, Dweck, & Sherman, 2001, Study 1).

Another line of research has examined the other side of the coin: entity theorists' greater tendency to amplify group differences. For example, Eberhardt, Dasgupta, and Banaszynski (2003) presented participants with a digitally morphed face of a person who was ambiguously Black or White. Half of the participants were told the person was Black while half were told he was White. Later, participants were asked to identify which of two faces was the one they had seen earlier. In fact, unbeknownst to participants, neither was the actual face; one was morphed to be 'more White' and the other morphed to be 'more Black' than the real one they had seen. The results showed that entity theorists tended to select the face that corresponded to the label they had been given (i.e. if they were told 'Black' they chose the 'Blacker' face), while incremental theorists chose the face that was the opposite of the label they had been given. Participants in a second study were asked to draw the face they had previously seen. In a striking demonstration, entity theorists' drawings were judged to be more similar to the race label than those of incre-mental theorists. Taken together these studies suggest that the race label caused entity theorists to *assimilate* their representation of the face toward the label and incremental theorists to *contrast* their representation away from the label. The authors argued that the entity pattern fosters the tendency to maintain sharper boundaries between ethnic

categories, while the incremental pattern fosters the tendency to see such boundaries as shifting and permeable.

To summarize, the entity theory is associated with a variety of information-processing techniques that may be marshaled to protect stereotypes from countervailing evidence, including selective encoding (Plaks, Stroessner, Dweck, & Sherman, 2001; see also Tong & Chiu, 2002) and selective disambiguating of ambiguous information (Eberhardt, Dasgupta, & Banaszynski, 2003). The incremental theory, on the other hand, is typically associated with the opposite tendencies. Thus, this research illustrates how perceivers' different starting assumptions can reverberate throughout the information-processing sequence. It is important to reiterate that these differences are found even when the entity and incremental theories are temporarily manipulated in the laboratory (e.g. Chiu, Dweck, Tong, & Fu, 1997; Levy, Stroessner, & Dweck, 1998; McConnell, 2001; Molden, Plaks, & Dweck, 2006; Plaks, Grant, & Dweck, 2005; Plaks, Stroessner, Dweck, & Sherman, 2001; Poon & Koehler, 2006).

Functional Importance of Meaning Systems

We have proposed that lay theories and their allied meaning systems provide perceivers with a framework for perceiving, judging, and acting upon social information (Levy, Chiu, & Hong, 2006; Molden & Dweck, 2006; Plaks & Stecher, 2007). As such, they represent a crucial − and trusted − cornerstone for basic social cognitive processes. Evidence for this functional importance may be gleaned from people's reactions when suddenly their theory is violated by incoming evidence.

In several studies, we have done just that. We presented participants with information that violated either the entity theory (by implying that the target person had undergone significant change) or the incremental theory (by implying that the target person was *in*capable of significant change despite the desire to change) (Plaks, Grant, & Dweck, 2005; Plaks & Stecher, 2007). If lay theories truly set the parameters for social cognition, then the violation of one's working theory should lead to a measurable sense of disorientation, anxiety, and motivated processing.

In one set of studies, Plaks, Grant, and Dweck (2005) presented participants with information about a target person 'Brad' who was described as either a 'math geek' or an 'artsy type'. Brad performed a series of behaviors, some of which were consistent with the math geek stereotype (and, in turn, inconsistent with the artsy stereotype) and some of which were consistent with the artsy stereotype (and inconsistent with the math geek stereotype). Plaks, Grant, and Dweck (2005) found that participants with an entity theory allocated significantly less attention to inconsistent behavior that violated the actor's defining traits than to behavior that supported his defining traits, while those with an incremental theory made no such distinction. Moreover, in one study (Plaks, Grant, & Dweck, 2005, Study 3), entity theorists showed a significant rise in anxiety when forced to read about trait inconsistency, whereas incremental theorists did not.

On the other side of the coin, incremental theorists displayed these exact same symptoms when confronted with information that violated *their* theory − i.e. an actor who displayed *too much* trait consistency (e.g. when Brad the math geek failed to improve his writing skills despite the desire and opportunity). That is, those with an incremental theory were similarly discomfited by evidence of someone who showed an *inability* to change, i.e. someone who was 'stuck in a rut.' In sum, both groups showed a similar constellation of reactions only when their respective theories were violated.

These studies shed important light on the literature on 'person memory.' Numerous researchers over the years have devised ways of assessing whether people generally emphasize stereotype-consistent or stereotype-inconsistent behavior (e.g. Hastie & Kumar, 1979; Sherman et al., 1998; Srull, 1981; Stangor & McMillan, 1992). Some of these studies have found 'incongruency effects' (preferential encoding of inconsistent information) while others have found 'congruency effects'. Our work suggests that participants in such studies enter with different subjective definitions of what constitutes 'consistent' and 'inconsistent behavior' and different ideas about the *meaning* of consistent and inconsistent behavior. This notion that 'theory consistency' is not the same thing as 'stereotype consistency' helps to define more clearly which types of behaviors participants (as opposed to experimenters) consider consistent and inconsistent. Thus, adopting a lay theories approach leads to more precise predictions regarding who will focus on what type of information.

In another set of studies, Plaks and Stecher (2007) tuned these ideas inward toward the self. Participants took a series of purported intelligence tests and were presented with predetermined feedback indicating that their performance had either improved, declined, or remained static over time. Participants' lay theory was found to be a powerful predictor of their reactions to these different outcomes. Not surprisingly, entity theorists took a decline in performance harder than did incremental theorists. Not only was the poor performance dispiriting, but also the dramatic change violated their belief in a fixed nature. More intriguingly, on certain measures, entity theorists also took dramatic improvement worse than did incremental theorists. On the one hand, entity theorists were pleased with their success, but at the same time, their belief that their ability was fixed made the improvement appear entirely unexpected and difficult to account for. Thus, entity theorists in the improvement condition showed significantly more anxiety than did incremental theorists. Finally, in the 'no change' condition, it was incremental theorists who experienced more anxiety and, moreover, displayed worse subsequent performance on a third test of equal difficulty. For incremental theorists, a failure to improve despite the effort and opportunity represents a direct refutation of their belief in the capacity to change. (These results indicate that incremental theorists are not merely optimists. If they were, the decline condition should have disturbed them more than the static condition. In other words, incremental theorists believe not only that people have the capacity to improve their skills, but also that people are not immune to the potential deterioration of these skills.) The Plaks and Stecher's (2007) results are thus parallel to the Plaks, Grant, and Dweck's (2005) results: in both cases, information that violated participants' theory (and only such information) produced similar patterns of affective, cognitive, and motivational responses.

These findings fit into the tradition of study on motivated cognition. Much of this literature has documented the variety of cognitive distortions that people will undertake in the name of preserving their *attitudes* (e.g. Clark, Wegener, & Fabrigar, 2008; Eagly, Kulesa, Brannon, Shaw-Barnes, & Hutson-Comeaux, 2000) or preserving (or enhancing) their sense of *self-worth* (e.g. Kunda 1990; Dunning & Cohen, 1992). We suggest that, in a similar vein, the entity and incremental theories represent particular content that people are motivated to defend in order to preserve their sense of causal certainty (e.g. Major, Kaiser, O'Brien, & McCoy, 2007; McGregor & Marigold, 2003; Pittman & Pittman, 1980; Weary & Edwards, 1996). Indeed, the need to confirm one's theory is so strong that even *prima facie* 'good news' for the self can spell trouble if it upsets one's theory, while *prima facie* 'bad news' may be experienced as comforting if it supports one's theory. Consistent with this idea, a violated theory has been shown to engender powerful anxiety (Plaks, Grant, & Dweck, 2005; Plaks & Stecher, 2007) that, in extreme cases, may lead

to severe psychoemotional consequences (Janoff–Bulman, 1992; Peterson & Flanders, 2002). Thus, lay theories may truly represent 'cornerstones' of the pursuit of meaning; as with actual cornerstones, when they are removed, the entire structure is in jeopardy.

Considering the evidence of how disturbing it is to have one's theory violated, it is in some senses remarkable that most people can be so easily persuaded to adopt either theory through the laboratory manipulations described earlier (e.g. Chiu, Dweck, Tong, & Fu, 1997; McConnell, 2001; Poon & Koehler, 2006). The effectiveness of the manipulations makes sense, however, given the key distinction between theory *violation* and theory *replacement*. In some experiments, when participants were faced with theory-violating information, no suitable replacement theory was offered. In such cases, participants engaged in biased processing to protect their theory. In many of the theory-priming studies, however, a coherent, 'scientifically validated' theory was described in the article participants read. In such cases, participants seemed more willing to accept the new alternative. These data indicate that people's foremost aim is to avoid being left 'theoryless'. In this respect, lay scientists behave like professional scientists. Kuhn (1962), in his analysis of scientific revolutions, proposed that scientists working in a prevailing paradigm typically reject or dismiss contradictory data at first. Only when a coherent and intuitive alternative theory emerges – one that convincingly accounts for the old and new data – do scientists begin to shift to the new paradigm.

Conclusion

In this article, we have argued that the entity and incremental theories are critical starting assumptions from which much of social cognition proceeds. We have shown that each theory carries with it a constellation of allied beliefs that are derived from the core belief. Each meaning system, in turn, creates a framework for encoding incoming social information in a manner that is consistent with its assumptions. Thus, each meaning system provides a distinct way of extracting meaning from that highly ambiguous and complex stimulus array that is human behavior. The differences between the two perspectives are evident across a range of 'classic' social cognition content areas including attribution (Molden, Plaks, & Dweck, 2006), person memory (Plaks, Grant, & Dweck, 2005; Plaks, Stroessner, Dweck, & Sherman, 2001), and stereotyping (Levy, Stroessner, & Dweck, 1998). Finally, we have suggested that people implicitly understand that these meaning systems are cornerstones of their social cognition. Thus, they deploy a range of psychological defenses to ward off threats to their theory and preserve the subjective sense that their meaning system is an effective tool for making sense of human behavior (Plaks, Grant, & Dweck, 2005; Plaks & Stecher, 2007).

Although we have focused here on theories of personality, people have theories about most of the important things in their lives (e.g. health, relationships, government). It is likely that such theories serve similar purposes – i.e. they impose meaning and a sense of control over an uncertain environment. As such, these types of theories are also likely to exert systematic influence on basic social-cognitive processes. Thus, an important task for future research will be to identify and map out the meaning systems associated with other fundamental theories, just as we have begun to do with the entity and incremental theories. Given the clear centrality of meaning-making in people's everyday experience, it is somewhat surprising that social and personality psychologists have not devoted more systematic programs of research to the topic of lay theories and meaning systems. We believe that our research on the entity and incremental meaning systems represents an important step in that direction.

Short Biographies

Carol Dweck is the Lewis and Virginia Eaton Professor of Psychology at Stanford. Her research has demonstrated the critical role of implicit theories or mindsets in motivation and achievement, and in the formation and perpetuation of stereotypes. More generally, her research has highlighted the central role of beliefs and belief systems in motivating and guiding behavior. She has been elected to the American Academy of Arts and Sciences and won the 2008 Donald Campbell Award for contributions to social psychology.

Sheri R. Levy is currently an Associate Professor of Psychology at Stony Brook University in New York. She received a BA in Psychology from the University of Michigan, Ann Arbor, and a PhD in Psychology from Columbia University in New York City. Her research focuses on understanding social–developmental processes that increase and decrease prejudice and particularly the role of people's lay theories in their intergroup attitudes and relations. She has co-authored papers on these topics for journals such as *Child Development, Group Processes and Intergroup Relations*, *Journal of Personality and Social Psychology*, and *Journal of Social Issues*. Her book '*Intergroup Attitudes and Relations in Childhood through Adulthood*' (co-edited with Melanie Killen) showcases international research on intergroup relations from a variety of social–developmental perspectives.

Jason Plaks conducts research on the intersection of motivation and social cognition. He has published articles on these topics in journals such as *The Journal of Personality and Social Psychology*, *The Journal of Experimental Social Psychology*, and *Social Cognition*. Current research focuses on the contents and motivational function of people's lay theories. He earned his PhD from Columbia University in 2001. Before coming to the University of Toronto, where he currently teaches, he taught at the University of Washington.

Endnote

* Correspondence address: Jason Plaks, Department of Psychology, 4003 Sidney Smith Hall, University of Toronto, 100 St George Street, Toronto, ON M5S 2H9, USA. Email: plaks@psych.utoronto.ca

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