AUTHORS' RESPONSE

Implicit Theories: Elaboration and Extension of the Model

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We found these commentaries to be deeply thoughtful and thought-provoking. Not only were we led down new paths, but we were also led to reexplore the old ones. In addition, it was gratifying to see that many of the most common questions were ones that we have addressed in our latest research. Thus we are able to present new data that speak to a number of issues, including stereotyping, cross-cultural differences, and the origins of implicit theories in early childhood. We begin with issues relating to the model and its constructs, and then we go on to consider generalization of the model to new areas.

The Model and Its Constructs

Goals and Motivation

The original model proposed by Dweck and Elliott (1983) and Dweck and Leggett (1988) is a motivational model with goals as central constructs. In this model, the two implicit theories create an emphasis on different goals, and the goals, in the context of the theories, then set up different cognitive, affective, and behavioral responses (Dweck, 1991).

Harackiewicz and Elliot (who are doing their own very interesting work on achievement goals) ask whether we still adhere to this formulation. In a related manner, Peterson admonishes us not to strip away feelings and motives, and Weiner calls for a network of constructs to which implicit theories are linked. Indeed, we remain very much committed to our motivational model. Our work repeatedly demonstrates that holding an entity theory of intelligence orients individuals toward *performance* goals (and a vulnerability to helpless attributions and reactions) relative to an incremental theory, which orients them more toward *learning* goals (and a mastery-oriented response; see, e.g., Dweck & Leggett, 1988). We continue to obtain clear support for these relations. For example, as part of a study with college students just conducted by Claudia Mueller and Carol Dweck, we included four items that pitted a preference for learning goals against a preference for performance goals. Students who held a fixed theory of their intelligence differed strongly and significantly from students who held a malleable theory on every one of the goal items.

Specifically, those with the entity theory agreed significantly more with the statements "If I knew I wasn't going to do well at a task, I probably wouldn't do it even if I might learn a lot from it" and "Although I hate to admit it, I sometimes would rather do well in a class than learn a lot." In contrast, those with the incremental theory agreed significantly more with "It's much more important for me to learn things in my classes than it is to get the best grades." The fourth statement had a slightly different format. It read "If I *had* to choose between getting a good grade and being challenged in class, I would choose ..." Students then circled either "good grade" or "being challenged." Most of the entity theorists (65%) chose the good grade option, whereas only 32% of the incremental theorists selected this option, with the majority opting for being challenged. So, as in our earlier work, the theories of intelligence that students held predicted their emphasis on learning versus performance goals, with one group being more oriented toward learning new things and being challenged and the other toward getting grades and performing well, even at the sacrifice of learning.

We also remain very much convinced that emotions play a large and critical role in the motivational processes set in motion by the two theories. In the target article, however, we did not construct the model around goals and we did not emphasize the roles of motivation and emotion. This is because our recent work on social judgment, unlike our work in the achievement area, has not yet focused extensively on people's goals (e.g., in impression formation) or on the role of their emotions in the way they react to other people. We thus chose to concentrate in this article on the more cognitive aspects of the model—the ways in which implicit theories may cognitively orient individuals toward different ways of understanding their experiences and the ways in which these different interpretations of experience can guide different reactions.

An important step, however, is to fill in the motivational and emotional aspects of the model for the domains of social perception and social interaction. Carol Dweck (in press) embarked on this task (see also Dweck & Leggett, 1988). In Dweck (in press), a model of the social domain is constructed around implicit theories and goals. This model is entirely analogous to the model in the intellectual achievement domain, with the entity theory orienting individuals more toward *judgment* goals (the general class of goals that includes performance goals) and the incremental theory orienting individuals more toward *development* goals (the general class of goals that includes learning goals). With judgment goals, the aim of the individual is to render a judgment of the attribute in question, whereas with development goals, the aim is to develop the attribute in question as well as to understand its dynamics. In the model, the theories and goals in concert then set up different reactions. The findings from our recent research (e.g., Chiu, Sacks, & Dweck, 1994; Hong, 1994; Hong, Chiu, & Dweck, 1994) are used to illustrate and support the model.

In summary, we remain strongly committed to a motivational model in which goals and emotions play critical roles, although the more cognitive aspects of our model were highlighted in the target article. Indeed, we believe that the full model has the kind of network of variables called for by Weiner in his commentary.

Causal Relations Among Variables in the Model

An important question, raised by Lewis, Peterson, and Sorrentino, relates to what actually causes what in the model. The model is set up to suggest that the two implicit theories foster different goals, interpretations of events, and reactions to events. Support for this view comes from studies in which we have manipulated implicit theories and have shown that this alters participants' goals and reactions. These findings suggest that implicit theories can serve as the cause of the other variables in the model. However, the variables in the model represent a network of interrelated structures, and it is indeed possible that by eliciting any one of the major variables, one also elicits others of its partners in the framework. Thus it is conceivable that by setting up situations that strongly promote certain goals or attributions, one may also make a certain implicit theory more salient to the individual. This is consistent with the view that when a knowledge structure is activated, related ones also become more accessible.

It is also possible that, developmentally, the variables arise in a different order than that represented in the model (see the Lewis commentary). For example, it could be that a concern with judgment and a tendency to react to negative outcomes in a helpless manner develop before children formulate theories about the fixedness or malleability of self-attributes. In this view, the implicit theory the child developed would grow up around the existing goals and patterns. This implicit theory would then join the network of variables, perhaps now driving the system, solidifying the concerns, making certain outcomes more meaningful, and making the goals and patterns more likely.

Alternatively, it is possible that the belief in a fixed or malleable self arises in conjunction with the concerns, goals, and patterns of reaction that characterize a given system in our model. For example, it is possible that the experiences that foster a concern with performance and judgment versus learning and development are ones that also promote the view of one's attributes as fixed versus malleable. We have a new study that speaks to this issue, and we describe it in the section on how the implicit theories might arise.

Can People Hold Both Theories?

Several commentators (Anderson, Darley, Harackiewicz and Elliot, Lewis, and Schunk) posed this question. For simplicity's sake, we have tended to portray the two implicit theories as mutually exclusive alternatives, and in our measures, we have asked participants to choose between the two. Indeed, logically speaking, they *are* mutually exclusive alternatives. Believing that something cannot be changed is the logical opposite of believing it can be changed. Nonetheless, students of the human mind know that the fact that two beliefs are opposites does not prevent people from holding them both (see Darley commentary). People do not tend to comb through their system of beliefs, spotting and eliminating contradictions and inconsistencies. Thus, along with our commentators, we think that it is perfectly possible for an individual to hold both theories. We agree that although one theory may be the more dominant and have stronger links to its allied structures in the model, the other may still be available and may become accessible under particular circumstances (see the Anderson, Harackiewicz and Elliot, Kruglanski, and Schunk commentaries). The fact that we have been quite successful in manipulating people's implicit theories (and, by doing so, eliciting other aspects of the model) suggests that perhaps both theories are familiar to many people. This possibility—that many people actually hold both theories, albeit to differing degrees—raises many other intriguing possibilities and suggests that research into the circumstances that might

elicit the different theories may well be in a fruitful direction.

Implicit Theories as Knowledge Structures

Several of the commentators (Anderson, Darley, Harackiewicz and Elliot, Kruglanski, and Lewis) suggested, in one form or another, the view of the implicit theories and their allied constructs (e.g., goals, attributions) as knowledge structures. We not only find this view to be congenial, we also find it to be extremely productive in that it helps capture a number of phenomena. For example, the knowledge structure approach allows us to understand more easily how an individual can hold both theories but to differing degrees. It captures the way in which each theory has links to other knowledge structures (such as goals and attributions), with the strongest links generally being to the other structures that we have depicted as within the same framework in our model (see Anderson commentary). For example, an entity theory would have stronger links to performance goals and internal, global, stable attributions than would an incremental theory. Even more interesting, the knowledge structure approach can capture the fact, cogently discussed by Darley and by Kruglanski, that the implicit theories can be relatively stable *and* relatively malleable. If an individual holds both theories as knowledge structures of differing strength, then this system can be fairly stable when left to itself. However, with direct intervention from the outside, the weaker theory can gain strength or accessibility and thus be more readily elicited in the future. Also, as noted by Anderson, the knowledge structure approach lends itself to representing the domain specificity of the theories.

Finally, this approach may also help us understand when the theories might not have their predicted consequences. We believe that much of the impact of the theories is through their allied structures. For example, much of the impact of the entity theory of intelligence comes from its links to performance goals and helpless attributions (i.e., to self-judgment and self-blame). We believe that the entity theory fosters these links, but we do not believe that this linkage is a logical necessity. Thus, if in a given individual, the entity theory were not strongly linked with these other structures, it would not have the same impact. For example, an individual might believe that his or her intelligence is fixed but that effort and learning are nonetheless of supreme importance. Such an individual might think and act much like an incremental theorist.

In summary, we agree with our commentators that thinking of implicit theories and their allied con-structs as knowledge structures can be illuminating and productive.

When Is It Better to Be an Entity Theorist?

Several commentators (Anderson, Harackiewicz and Elliot, Peterson, Sorrentino, and Weiner) note that we have discussed many advantages of the incremental theory but have discussed few for the entity theory. After all, such a widely held view must have something more than parsimony going for it or why would it be so widely held? We subscribe wholeheartedly to the idea that all views have their costs and benefits (Higgins, 1991). Although we have thus far tended to find fewer costs for the incremental view and fewer benefits for the entity view, let us examine this issue further.

Let us begin with the issue of when an incremental theory might serve someone poorly. This might occur when people cannot come to terms with personal limitations, either their own or those of others. That is, believing in malleability of personal attributes, people might persist in a course of action for which they are unsuited (see Peterson commentary). For example, they may train to be concert pianists or basketball stars, despite the fact that their current degree of ability and their rate of progress make success unlikely. In a related vein, believing in the potential for growth and change, some incremental theorists may overestimate the likelihood of personal change in others, as the possibility of change and the probability of change are two separate things. This can pose problems when such people invest heavily in dysfunctional relationships (e.g., with parents, romantic partners, or friends) under the assumption that the individual in question will soon actualize their potential for change. To summarize this point, an incremental theory can sometimes become a liability if the incremental theorist does not come to terms with limitations in the extent of possible growth or in the likelihood of growth.

Let us now assess the potential benefits of the entity theory. One question raised by Elliot and Harackiewicz and by Weiner is: Shouldn't it be advantageous to believe in fixed traits when you think that yours are fixed and wonderful? Or as an extremely bright student of Carol Dweck's, perhaps referring to himself, once asked: "Wouldn't it be good to be an entity theorist if you were really a genius?" Continuing with the case of intelligence, our answer is: Yes, if you could really be sure. However, the entity theory system does not seem to be a system that breeds security. First, with intelligence (or most personal attributes, for that matter), one is dealing with an invention, a construct that cannot be measured with any certainty. One has to keep looking

at reflections of it in performance to reassure oneself of its adequacy. So, although entity theorists believe their intelligence is fixed, they can never really know for certain at what level it is fixed, and their estimates of this fixed trait may vary considerably over time depending on the outcomes they are experiencing. In other words, self-judgments of presumably fixed traits can be highly unstable.

Second, as we suggested earlier, there are other correlated beliefs within the entity theory framework that appear to make confidence somewhat fragile. These are the beliefs not only that failure implies low ability (Hong & Dweck, 1992), but also that the need for effort, in and of itself, implies low ability (see Dweck & Leggett, 1988). To illustrate the latter, Claudia Mueller and Carol Dweck have just completed a study in which they asked college students with entity and incremental theories of intelligence a number of questions about their goals and beliefs. We found that entity theorists were far more likely than incremental theorists to agree with statements like "If you're really good at something, you shouldn't have to work very hard to do well in that area" or "I sometimes feel that the more effort you have to put into your school assignments, the less intelligent you probably are." Students with the incremental theory squarely disagreed with these assertions. This means that for many entity theorists, challenges and obstacles, which require effort, can automatically call their intellect into question. Thus, even if an entity theorist is basking in the glow of past successes, the presence of failure, and even the need for effort, can cause that glow to dissipate.

Yet, if someone truly believed that he or she were extremely intelligent and did not call this into question or feel the need to prove it on a regular basis, then this would seem to be an ideal state—and it is typically called unconditional positive self-regard or a sense of unconditional worth. However, we believe that this desirable state actually exists more often among incremental theorists (see Burhans & Dweck, in press). In our work with young children, we are addressing this question directly. As we describe later, we have found that a procedure that promotes *conditional* positive regard also promotes the belief in fixed traits.

This is not to say that an entity theory cannot potentially fuel great achievement. Although much of our work documents the way in which the fixed theory can promote vulnerability to helplessness, it is also possible that the need to prove one's ability (and, perhaps, one's worth) can lead to tremendous efforts. That is, if entity theorists can escape the belief that high effort implies low ability, then they may attempt to validate their ability through great accomplishment. This mode of achievement may have a more driven quality in contrast

to the more learning-oriented, possibly more intrinsically motivated achievements of those with an incremental theory, but it can nonetheless yield considerable attainments.

In summary, the entity theory may often lead individuals to shy away from effort and challenge, to question their intelligence in the face of difficulty, and to focus on validating and protecting their sense of ability at the sacrifice of learning. However, we agree that an entity theory of intelligence can sometimes be a spur to achievement, if individuals are either certain of their high ability or are led to prove their ability through high-effort accomplishments.

Turning to implicit theories of others, we showed in the target article how entity theorists tend to make rapid, often global evaluative judgments of others, sometimes on the basis of very little information. We showed how incremental theorists, in contrast, tended to focus more on psychological mediators in understanding people's behavior (people's goals, feelings, states of mind). We also suggested that for them, really knowing a person would involve seeing him or her over a variety of situations and integrating the information. Anderson, in his commentary, suggests that perhaps when quick social judgments are called for, it may advantageous to be an entity theorist.

This intriguing suggestion presupposes that entity theorists are "experts" in rapid judgment. It presupposes that the initial trait judgments made by entity theorists are more complete and accurate than the initial mediational analyses made by incremental theorists. On the other hand, it is possible that although incremental theorists prefer to take into account more information, they are able to make reasonable decisions with whatever evidence is available. This would be interesting to test empirically in a situation where there is a criterion of accuracy and where participants are given limited information with which to make judgments and predictions. We could then tell whether entity theorists do, in fact, have the greater ability to "size up" people on the basis of first impressions. Our past work suggests that this is most likely the case when the target person truly fits a stereotype or, as Anderson suggests, when there is no situational information that would conflict with a straightforward trait ascription. Our prediction is that entity theorists would be less accurate than incremental theorist when the target has characteristics that erroneously suggest a stereotype or when there is information that should modify trait attributions.

Peterson also makes the compelling suggestion that the cognitive efficiency and parsimony of the entity theory may be greatly adaptive for such people as politicians, whose success is often linked to the simplicity of their message. He notes that in our society,

"individuals with simple, highly general, value-laden schemas may be better adjusted and more highly regarded than other individuals." This would be certainly be quite a worthwhile hypothesis to test.

In summary, it would be interesting to determine when the rapid trait ascriptions made by entity theorists might be advantageous and when the more context-sensitive mediational analyses that characterize the incremental theorists are preferable.

Measurement of Implicit Theories

Several commentators had questions about our measures of implicit theories. We have taken many steps to ensure the validity of our measure, particularly because the measure presents the entity theory choices for participants to agree or disagree with. First, we have gone to great lengths to ensure that endorsing the entity theory was not a function of an acquiescence set or a reflection of social desirability tendencies. Next, we have taken pains to show that those who disagree with the entity theory statements (that the attribute cannot be changed) do in fact hold an incremental theory and do not simply reject the entity theory. For example, on several occasions we asked our participants to explain their theory choices, and in virtually every case, those who disagreed with the entity theory statements explicitly espoused an incremental theory—the belief that the attribute can be changed.

We have also used converging operations to test the measure's validity. For example, we have manipulated participants' implicit theories to see whether we get the same results as we do when we measure their naturally existing implicit theories using our measures. What we find, whether we are looking at goal choices, judgments, or persistence as dependent measures, is that participants who are given entity or incremental theories look much the same as participants who are classified as holding those theories according to our measure. For example, in two just-completed studies by Chi-yue Chiu, college students did well or poorly on an ability test and then were asked if they were interested in pursuing remedial work that was likely to aid their future performance. In the first study, students' theories were assessed by means of our measure, whereas in the second study, students' theories were manipulated by means of a compelling scientific article (Bergen, 1991). The same pattern of results was obtained in both studies. Basically, incremental theorists who had done poorly were very eager to pursue the remedial work, but entity theorists who had done poorly were not. (Whether the entity theorists did not believe that they could change their ability or did not wish to risk engaging in remedial work and still doing poorly, they did not

elect a learning task that could serve their goal of performing well in the future.) These kinds of studies, in which those given an explicit entity or incremental theory look very much the same as those already holding these theories, lend further support to the validity of our measures.

That said, it is also true that as scientists we are always seeking better ways to do what we do, and we have continued to experiment with different ways of asking our implicit theory questions. Recently, Sheri Levy-Wexley and Claudia Mueller, in our laboratory, devised a new implicit theory measure that contains both entity and incremental choices. For each item, a stem is presented (A person's intelligence is something about them that they ... ; People's intelligence is an attribute that they ... ; Someone's intelligence is part of them that they ...). Participants then complete the stem by choosing either "cannot change" or "can change." This measure, while offering both options to participants, avoids the problem of presenting a too-compelling statement of the incremental theory that participants in some of our past studies seemed unable to resist. In addition, this new measure, like the one we have been using, has very high internal reliability (.98).

Interestingly, the correlation between this new measure and our old one further attests to the validity of the measure we have been using. In a sample of 134 participants who took both measures, the correlation between the two measures was .88. Of those who were classified as entity theorists on the old measure, 91.8% were classified as entity theorists on the new one. Even more important (as our old measure did not give participants a chance to endorse the incremental theory directly), of those who were classified as incremental theorists on the old measure, 90.6% were classified in the same way on the new measure. Thus, when those who disagree with the entity theory are given the opportunity to directly endorse the incremental theory, they do so.

In summary, although it may initially give pause that the measures we have been using do not include a direct incremental choice, our validation studies, our manipulation studies, and the results from a new version of the implicit theory measure all attest to the validity of the measures for assessing both the entity and the incremental theory.

Extensions of the Model

Are There Other Implicit Theories or World Views?

Several commentators (Peterson, Sorrentino, and Weiner) suggest, quite plausibly, that placing our

model in the context of other implicit theories or world views would offer a broader perspective and would increase the power of our approach. This is something that we have thought about at great length, reading extensively in philosophy and psychology on this and related subjects. However, we have not yet identified other implicit theories or world views that we believe have the psychological significance of the ones we have been studying.

First, we believe that the issues of fixedness versus malleability are fundamental to human cognition and that, developmentally, these are variables that are critical to a child's emerging understanding of the world—both the physical world and the social world as well as the self. As children come to know their physical world, they must learn which objects are relatively permanent and which can be acted on in ways that change them.

More precisely, they must learn what operations have what effects on what objects. For example, they must learn that pouring water from one container to another does not change the amount (Piaget's classic conservation task), but that boiling the water for a period of time does. Interestingly, viewed in this way, Piaget's emphasis on conservation (children's coming to the knowledge that substances remain invariant across operations or transformations) is only part of the picture. Certain objects do indeed vary when acted on in particular ways. As such knowledge accrues, children will come to know which objects are relatively malleable and can be altered by many operations and which are relatively fixed and can be altered by few, if any, operations. In this way, they will be able to form expectations for the behavior of objects and will understand how to interact with them in effective ways.

In a related manner, children must learn which aspects of their social world are amenable to personal control and which are likely to remain invariant in the face of attempted change. Again, the issue of what is alterable through one's actions and what is simply a fixed given would seem to be a very critical one for effective functioning in the social world. Then, as children begin to develop a sense of self and its attributes, the same questions may be asked. That is, in the same way that they asked whether the objects and processes in their environment were subject to change through their efforts, they may now ask whether the attributes of the self are permanent givens or are malleable qualities. The answer to this question may tell them what goals to pursue and may guide how they seek to build and maintain their self-esteem (see Dweck, 1991; Dweck & Leggett, 1988).

We are thus arguing that the fixed–malleable distinction is a very basic one that people apply to all manner of objects, processes, and attributes. These distinctions will enhance the perceived predictability of their world and will serve as guides to behavior in that world.

Next, when we look at writings on world views, we find that the ones that have been most often identified as shaping human thought are highly similar to the two implicit theories we have been investigating (although we conceive of our implicit theories as domain specific and the world views are usually conceived of as domain general). Typically, some type of static or fixed view is pitted against some type of dynamic or malleable–controllable view. For example, as we noted in the target article, the metaphysical systems portrayed by Alfred North Whitehead (1929, 1938) are built entirely around static versus dynamic world views. He contrasted scientific systems and philosophical theories that assume a world of static objects versus dynamic, evolving processes. Not only are these two world views consistent with our entity and incremental theories, but the properties, workings, and implications of the systems are similar. For example, in the static view, the emphasis is on measurement of enduring properties, whereas in the dynamic view, the emphasis is on understanding and influencing the dynamic processes in the evolving systems.

Toward the end of his life, Jean Piaget (Piaget & Garcia, 1983) came to the view that the growth of logical thought, heretofore the alpha and omega of cognitive life for him, did not provide a complete account of cognitive development or of individual differences in cognition. He came to believe that equally important in shaping cognition were the conceptions of the world to which the individual subscribed. Of these, he saw two primary ones: the Aristotelian view of the world as essentially static versus the conception of the world as being in a constant state of "becoming." Piaget and Garcia detailed how these conceptions of the world can control the assimilation of every experience by generating different interpretive frameworks for one's experiences.

Indeed, a number of modern thinkers not only identify these two world views but regard the introduction of the dynamic world view as defining the onset of the modern era in Western science, philosophy, and society. For example, Agnes Heller (1967/1981), in her book *Renaissance Man,* argued that the revolution of the Renaissance was a revolution in the conception of persons. For her, what defined this pivotal period, what made later democratic revolutions possible, and what ushered in the modern age was a general shift from a static conception of persons toward a dynamic one. In the static conception that was prevalent during antiquity, people were viewed as having circumscribed potentialities and objective limits. The Renaissance introduced the dynamic idea of self-creation and the

perfectibility of the self—the idea that people can shape their own natures. Alexandre Koyre (1957), the historian and philosopher of science, agreed that the sweeping revolution in thought that occurred in the 16th and 17th centuries involved a fundamental change in world view away from a conception of the world as a closed, finite, well-ordered, static hierarchy of perfection to a conception of the world as an unbounded one best understood in terms of dynamic processes.

Both linguists (Bloom, 1981; Whorf, 1956) and philosophers (Langer, 1982) have suggested that these different modes of thought may describe and explain important cross-cultural differences. Whorf and Bloom argued that these different ways of thinking are embodied in language. Whorf (1956) compared standard European languages with the Hopi language, pointing out the ways in which the European languages made continuous variables, such as time, into objectified, discrete units, thus laying the foundation, he believed, for the more static metaphysics of the European cultures. In a related vein, Bloom proposed that some languages, like English, tend to "entify" the attributes of people and things, for example, by taking adjectives that describe people's behavior (e.g., intelligent, honest) and making them into nouns that imply a more static internal property with its own reality (intelligence, honesty). Thus, a host of thinkers have identified static versus dynamic world views as fundamental modes of human cognition.

Petersen, in his commentary, cites Pepper's (1942) well-known book, *World Hypotheses,* and wonders how our theories fit with the several world views that Pepper described. Although Petersen enumerates six such views, Pepper boiled down the meaningful world theories of philosophers into four basic ones: formism, mechanism, contextualism, and organicism. However, Pepper went on to note that there is "a very strong tendency for formism and mechanism to combine. They fly to each other's arms for mutual support" (p. 146). He then asserted that "contextualism and organicism are so nearly allied that they may almost be called the same theory" (p. 147). (He also noted some have combined mechanism and contextualism, but with unhappy results.) This would boil it down to two basic theories, and when it does we find that the first is characterized by the existence of generalized static forms with discrete laws expressing the relation among these static constituent objects and events. The second is characterized by an emphasis on change and process occurring within contexts (like person–environment interactions). Thus we are left, once again, with a more static system of fixed elements with simpler cause-and-effect laws versus a more dynamic system characterized by change, context, and process.

Research by Johnson, Germer, Efran, and Overton (1988) supports our analysis of Pepper's world views. In one study, they asked researchers from different disciplines to fill out the World Hypothesis Scale (Harris, Fontana, & Dowds, 1977), which assesses people's belief in each of Pepper's four world views. A factor analysis was performed on the responses, and the first factor that came out suggested that the four world views are highly interrelated and that a simpler structure may underlie them. Specifically, the factor loadings of the World Hypothesis Scale on Factor 1 were −.78 (Formism), −.79 (Mechanism), .67 (Organicism), and .83 (Contextualism).

This finding suggests that underlying the four different world views may be a more central, bipolar belief that differentiates formism and mechanism from organicism and contextualism. (Johnson et al., themselves favor a two-world-view system—mechanism and organicism.)

To summarize, we remain open to the possibility of identifying other psychologically meaningful world views, but we have not yet discovered ones that are (a) clearly different from the ones we have studied, and (b) likely to have the same level of cognitive and motivational impact.

However, there is another type of variable that we think is important to consider, and we have included an assessment of it in virtually all of our studies of implicit theories. It is a *confidence, optimism,* or *positivity* dimension, and it could be considered to represent a kind of world view (see, e.g., Janoff-Bulman, 1992). Specifically, in our studies of students' theories about their intelligence, we ask participants to rate their confidence in their own intelligence. In our studies of implicit theories of people's morality, we ask participants to rate their confidence in people's moral character. (See Table 4 in the target article for examples of the items on these measures and Table 5 for the correlations between measures of implicit theories and confidence. Contrary to Darley's intuition that entity theorists would be more negative or pessimistic than incremental theorists, there is no consistent relation between implicit theories and confidence or optimism in any of the domains we have studied.) When we measure both implicit theories and confidence, we typically find that implicit theories account for a great deal more of the variance. However, as suggested by Harackiewicz and Elliot and by Schunk, the confidence variable can combine with implicit theories in interesting ways. For example, entity theorists with high confidence in their intelligence are sometimes more mastery oriented on some dependent measures than are their counterparts with low confidence. Thus,

high confidence can sometimes serve as a protective factor (see Hong, Chiu, & Dweck, in press; see also Elliott & Dweck, 1988).

In summary, in our studies of achievement motivation and of social judgment, we have focused on the role of entity versus incremental implicit theories, but we continually seek to identify other variables that play a role in the processes we are studying.

Stereotyping and Beliefs About Group Differences

Several of the commentators asked about the relation between implicit theories and stereotyping or suggested that research in each area could potentially inform the other—for example, about how person-related knowledge structures influence judgments, affect, and behavior (see the Anderson, Darley, and Kruglanski commentaries). We have given a great deal of thought to how implicit theories might be related to stereotyping. For example, given our findings that entity theorists tend to readily assign fixed traits to people, we wondered whether they would also apply traits more readily to groups of people and thus engage in stereotyping more than incremental theorists. Incremental theorists, for their parts, are more likely to look at the psychological processes and circumstances behind behavior (Hong, 1994) and to take account of the circumstances of the individual (Erdley & Dweck, 1993). They might thus be less likely to form trait-based stereotypes.

We have initiated a line of research to address this question. In one set of studies (by Sheri Levy-Wexley and Carol Dweck), we are looking at entity and incremental theorists' knowledge of racial stereotypes, their endorsement of racial stereotypes, and their explanations for those stereotypes. In another set of studies (by Steve Stroessner, Sheri Levy-Wexley, and Dweck et al.), we are giving participants information about the behavior of people in novel groups. One group is characterized by many positive moral acts (or intelligent acts) and the other by many negative (or unintelligent) ones. The question here is whether entity theorists are more likely than incremental theorists to form stereotypes of the novel groups. For example, are they more likely than incremental theorists to ascribe traits to the groups such that they (a) exaggerate the differences between the groups, (b) underestimate the differences within the groups, and (c) generalize the traits to new members of the groups?

We had not completed any of these studies when we wrote the target article, but we have now completed the first set, and the results are quite interesting. We found,

first, that when we asked college students to list the common stereotypes of African Americans, entity and incremental theorists (implicit person theory) were extremely similar in the number and type of stereotypes they listed as well as in the valence they attached to each stereotype. Thus, any differences between entity and incremental theorists are not ascribable to differences in exposure to or knowledge of stereotypes. (See Devine, 1989, and Gilbert & Hixon, 1991, for discussions of how individuals may not differ in their knowledge about stereotypes or the availability of stereotypical beliefs, but rather in the their degree of agreement with those beliefs and in the probability that they will apply them in relevant situations.)

Indeed, it was when the groups were asked to rate how true they thought the stereotypes were that differences began to emerge. In two studies, one in which participants rated the stereotypes that they had generated and one in which they rated a series of stereotyped attributes that we provided, entity theorists rated the stereotypes overall as significantly more true than did incremental theorists. Moreover, they rated several individual stereotypes as more true, including ones that referred to moral character and intellectual ability.

Our participants were also asked to explain why they thought particular stereotypes of African Americans had persisted. To indicate their beliefs, they rated several possible explanations for each of the stereotypes we presented. Of greatest interest to us were explanations that invoked innate characteristics of the group versus explanations that invoked the experience or environment of the group. As one might predict from their belief in fixed traits, entity theorists explained the stereotypes more in terms of innate characteristics than did incremental theorists. In contrast, also in line with our prediction, incremental theorists agreed more with environmental explanations than did entity theorists.

We wondered whether the relative tendencies of entity and incremental theorists to invoke innate factors were specific to their explanations of stereotyped attributes or were simply the ways in which the groups tended to understand the origins of attributes in general. Therefore, in another study, entity and incremental theorists were given essentially the same series of attributes (not attached to any social group) and the same array of explanations to rate. As before, entity theorists endorsed innate explanations for these attributes significantly more strongly than did incremental theorists, whereas incremental theorists endorsed environmental explanations significantly more strongly than the entity theorists. This suggests that the greater tendency of entity theorists to characterize social groups in terms of

innate traits of character and ability is a natural outgrowth of the way they understand people and their attributes in general. In the same vein, it suggests that the greater tendency of incremental theorists to emphasize environmental factors as influences on group attributes is a natural extension of the way in which they understand the development of personal attributes in general.

In summary, our research is showing that entity theorists, more than incremental theorists, believe that stereotypes of African Americans are true and that these stereotyped traits are a result of innate factors.

Darley, in his commentary, refers to the arguments made in *The Bell Curve* (Herrnstein & Murray, 1994) that intelligence is in large part genetically based and fixed and that, therefore, differences in the intellectual performance of different racial groups is an unalterable fact. He points out that entity theorists may be well on their way to holding such a point of view. Our research findings just cited show that entity theorists do indeed hold views that are like some of the views expressed in *The Bell Curve*. The findings also suggest the hypothesis that, like Herrnstein and Murray, entity theorists might also be less likely to see merit in social programs designed to help disadvantaged minorities "catch up" with the more advantaged groups. That is, if someone believes that a trait is innate and unalterable, then what would be the purpose of spending large sums of money trying to change that very trait? We are in the process of testing this hypothesis.

The idea that group stereotyping may be a natural outgrowth of a very common way of thinking has many implications. It may explain why stereotyping and its offshoot, prejudice, are so ubiquitous and why attempts to counter stereotyping and prejudice so often meet with such limited success. Although stereotyping and prejudice may serve a variety of goals (self-esteem goals, need for a scapegoat), our work suggests that individuals may not even need these special goals to display these tendencies. (In this regard, our view would resemble other cognitive theories of stereotyping, such as Hamilton, Stroessner, & Driscoll, 1994). Instead, our findings suggest that these tendencies may arise rather spontaneously, because they are so clearly related to how entity theorists tend to understand and react to the social world.

According to our analysis, how would one address stereotyping and prejudice? Our analysis implies that if one wished to address stereotyping, one might well have to address individuals' implicit person theory, perhaps challenging some of their assumptions about the nature of human attributes and, in an allied way, their assumptions about how best to understand people and their behavior.

Implicit Theories and Cross-Cultural Differences

Several of the commentators (Anderson, Kruglanski, and Peterson) ask whether implicit theories might help account for cross-cultural differences, and we believe that they may well. First, Stevenson and Stigler (1992), in their influential book *The Learning Gap: Why Our Schools Are Failing and What We Can Learn From Japanese and Chinese Education,* reported their extensive cross-cultural research comparing the achievement beliefs of Asian school children and their parents with those of American school children and their parents (see also Stevenson & Lee, 1990). Their results show a far greater belief in malleable intelligence and in the importance of effort among those in the Asian culture, compared to the relatively greater emphasis in our culture on fixed intelligence and the role of ability (vs. effort) in influencing achievement. The authors speculated that the difference in these beliefs may help account for the greater achievement that characterizes students from Asian cultures.

On another front, Markus and Kitayama (1991) compare cultures that emphasize an *interdependent* versus *independent* self. (See also Triandis, 1989, for a discussion of collectivistic vs. individualistic cultures, a highly related dimension.) Markus and Kitayama hypothesized that people in interdependent (Eastern) cultures, because of their view of persons as embedded in contexts, would be less likely to explain people's behavior in terms of (context-free) personality traits than would people in the American culture, who view persons as more decontextualized beings. They then review evidence that individuals in Eastern cultures do, in fact, produce fewer personality traits and more context-situated descriptions in describing people and explaining their behavior than do their American counterparts (e.g., Miller, 1984; Shweder & Bourne, 1984).

In a recent article, Morris and Peng (1994) presented additional evidence that Chinese subjects generate fewer traits as causal explanations than do Americans. However, they propose that the lesser tendency of Asians to make trait causal attributions may stem, not simply from greater collectivism or interdependence per se, but from a greater prevalence of incremental-type theories in their cultures. Given our consistent finding of the association between implicit theories and trait use, it seemed possible to us as well that implicit theories could help account for the cultural difference, especially given Stevenson and Stigler's finding of greater incremental beliefs about intelligence in Asian cultures.

We are now testing this hypothesis by assessing implicit theories, individualistic versus collectivistic beliefs (as measured by the Brown et al., 1992, scale), and trait ascription in Hong Kong and American samples. As of this time, we have only half of the data—the Hong Kong half—but these data are already interesting. First, when we compare the endorsement of the implicit theories in the Hong Kong sample to the endorsement level we have typically found in our comparable American samples, it is clear that the proportion of incremental theorists is appreciably greater in the Hong Kong sample (as predicted by Anderson in his commentary). Second, when we look at the relation between the belief measures and trait ascription in the Hong Kong sample, we find a significant negative relation between the tendency to hold an incremental theory and the tendency toward trait ascription. This relation was, in fact, stronger than the relation between individualism–collectivism and trait ascription, and it remained highly significant when the effect of collectivism was partialled out.

In short, our look into implicit theories as a factor in cross-cultural differences has just begun, but we are encouraged by the promising tidbits that have presented themselves thus far.

Origins and Development of Implicit Theories

Several commentators (Anderson, Lewis, Peterson, and Schunk) ask how individuals come to form particular implicit theories. Our work with young children is beginning to suggest some ways. Although we do not rule out children's temperament as a factor that can set them along a path to one theory or the other (as suggested by Lewis), we are beginning to understand the socialization practices that might play a key role. (It should also be noted that the studies in which we manipulated implicit theories speak to the potential for the environment to influence them.)

Our first hints about the rearing practices that might foster the different theories came from studies with young children in which we asked our preschool and kindergarten participants to role-play parental reactions to their failures or mistakes (see Dweck, 1991; Heyman, Dweck, & Cain, 1992). In these studies, we saw dramatic differences in the adult–child scenarios role-played by children who displayed helpless responses and a belief in stable goodness–badness versus those who displayed more mastery-oriented responses and a belief that badness could be changed. Specifically, the helpless/fixed-theory children role-played significantly more criticism and punishment from the

adult figures, often having the adult tell them that they were bad for what they had done. In contrast, the mastery-oriented/malleable-theory children role-played significantly more positive and constructive responses from the adults in their lives. Not only did they have the adults complimenting the positive aspects of their work, but they also had them suggesting future strategies, like more effort, that might be useful.

Although we did not take the role-played scenarios literally—for we doubt that many parents are so critical or punitive of a young child's performance—they did lead us to form hypotheses about what kinds of socialization regimes might foster the different beliefs and response patterns displayed by the children.

In a new study by Melissa Kamins and Carol Dweck, we tested these hypotheses. Using dolls and imaginary scenarios (based on ones used by Heyman et al., 1992), we had children pretend to perform a series of four tasks for a teacher. (We used dolls and imaginary scenarios so that no criticism would be delivered to the children themselves.) In each case, the performance of the task was inadequate or incomplete, and the teacher, after pointing out the inadequacy, delivered one of four kinds of critical feedback (with children randomly assigned to condition). This ranged from feedback that reflected on the child as a person and that conveyed contingent regard from the adult ("I'm *very* disappointed in you") to feedback that oriented children toward future strategies ("Maybe you could think of another way to do it.") The other two feedback conditions focused on the act itself ("That's not the right way to do it" and "That's not the right way to do it because ..."). Children were then given a fifth scenario of the same general format except that they now received no feedback about their mistake. The question was, how would they respond to this last scenario as a function of the prior feedback they had received?

We found that the feedback significantly affected the way children judged themselves, the affect they reported, how constructively they responded to the final scenario, and even their implicit theory of goodness–badness. The children who received the person judgment (compared to the other three groups taken together and compared to the group that received the strategy feedback) showed significantly harsher self-judgments for the last scenario (saying they felt that they were not good or nice children), rated themselves as significantly sadder, came up with significantly fewer constructive solutions for addressing their mistake, and agreed significantly more with a fixed theory of goodness–badness. The strategy group, in contrast, showed the most positive and constructive responses overall, along with endorsement of malleable goodness–badness.

How might the feedback have influenced the children's implicit theories? Feedback that conveys judgment of the child as person may suggest that the adult, by scrutinizing the child's behavior or performance, has seen deeply into the child and has rendered a judgment of a permanent quality (e.g., the child's basic goodness, adequacy, or worth). Feedback that suggests new strategies, in contrast, suggests that deficiencies can be altered through effort.

In summary, the results of this study suggest that a judgmental stance on the part of parents may foster the development of fixed theories in children, along with a tendency toward harsher self-judgments and more helpless responses. An emphasis on effort and strategies, by comparison, can foster the development of malleable theories, along with a more positive, mastery-oriented response to obstacles. Admittedly, we were a bit surprised at how readily these theories and response patterns could be fostered and, thus, how readily children's histories and established patterns could be overridden. However, the results were extremely clear and strong, with the predicted differences occurring on almost every measure. This lends further support to the notion that the implicit theories are very basic categories of cognition that children may be "prepared" to learn and apply. It also lends support to the idea that implicit theories may be knowledge structures that we have available to us and that become differentially accessible depending on the situation.

We have also wondered whether an entity theory might be fostered by parents who overpraise positive traits—for example, always telling children how smart they are when they do something well. Might this also instill in the child the sense that his or her products reflect some deep and permanent quality? Might this also set children up to be vulnerable when a flawed product is produced, if they now take this as a new reading of their inner attribute? Again, an entity theory is the theory that an attribute is fixed (not alterable through one's actions), but one never knows at what level the attribute is fixed. In a current study (by Claudia Mueller, Melissa Kamins, and Carol Dweck), we are testing hypotheses about the effects of different types of praise on young children's beliefs, self-judgments, affect, and behavior in the face of subsequent setbacks.

In another project in our laboratory, Claudia Mueller and Carol Dweck are looking directly at parental reports of their beliefs and practices and testing our hypotheses about how these predict their children's beliefs and response patterns. In short, we are very interested in the origins of implicit theories and in the factors that influence their development and expression.

Concluding Comments

In summary, we have considered a number of issues relating to our model and its constructs: where motivation fits into the model, whether people can hold both implicit theories, the causal relations among the variables in the model, when an entity theory might be advantageous, the benefits of thinking of implicit theories as knowledge structures, and how implicit theories are best measured. We also examined generalizations of the model to new areas, such as stereotyping and cross-cultural differences. Finally, we considered the origins of implicit theories and presented new research findings that speak to this question.

Commentators also wondered about the relations between implicit theories and other cognitive, personality, and motivational variables and saw potentially rich links to other research traditions. These are issues that we are continuing to think about and investigate empirically. We expect that the many perceptive comments will continue to inform our research for a long time to come.

Notes

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