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Implicit Self-Theories in the Academic Domain: Implications for Goal Orientation, Attributions, Affect, and Self-Esteem Change

RICHARD W. ROBINS
University of California, Davis, Davis, California, USA

JENNIFER L. PALS
College of William and Mary, Williamsburg, Virginia

This study supported hypotheses derived from Dweck’s model about the implications of two implicit self-theories: Entity theorists believe their intelligence is fixed, whereas Incremental theorists believe their intelligence can be increased. Findings showed no normative change in implicit self-theories from high school through college and relatively stable individual differences during college. Entity theorists tended to adopt performance goals, whereas Incremental theorists tended to adopt learning goals. In terms of attributions, affect, and behavioral response to challenge, Entity theorists displayed a helpless response pattern and Incremental theorists displayed a mastery-oriented response pattern. Finally, Entity theorists declined in self-esteem during college whereas Incremental theorists increased self-esteem, and path analyses showed that this effect was mediated by goal orientation and the helpless versus mastery response patterns.

I feel upset, ashamed at my failure, angry that I couldn’t have done better, and even a little depressed. Basically, I think my GPA sucks, ergo, I suck. I value grades over education, which is wrong.—College student with an Entity theory of intelligence

I feel I can do much better in school. It is still hard for me to accept the fact that I have a C on my transcript, but I look at my grades and I am inspired to do well . . . And, despite my grades, I feel like I have learned a lot.—College student with an Incremental theory of intelligence

As these quotes illustrate, people differ in the way they approach achievement situations and in the way they perceive themselves within such contexts. Some people place a lot of importance on performance, whereas others care more about the
experience of learning. One person relishes a challenge while another takes the easy route to avoid looking stupid. Some people attribute their successes to their natural ability while others believe they simply worked hard. And some people feel discouraged when they get a bad grade, whereas others become inspired to try even harder.

According to Dweck’s social-cognitive model of motivation, differences in the way individuals approach achievement situations are linked to the implicit theories they hold about their intellectual ability (Dweck, 1999). Dweck distinguishes two basic beliefs: Entity theorists believe their intelligence is a fixed quantity that cannot be changed, whereas Incremental theorists believe their intelligence is malleable and that they can get smarter. According to Dweck’s model, Entity theorists tend to adopt performance goals, focusing on documenting or proving their (fixed) ability level by gaining approval and avoiding negative evaluations of their ability; in contrast, Incremental theorists tend to adopt learning goals, focusing on developing and improving their (malleable) ability level by mastering challenging tasks. These implicit self-theories and their accompanying goal orientations create distinctive frameworks for interpreting and responding to failure. In the face of failure, Incremental theorists exhibit a mastery-oriented response pattern, attributing their failure to insufficient effort (“I’m failing because I didn’t try hard enough”). As a result, while working on a challenging task, mastery-oriented individuals show increased effort, more effective problem-solving strategies, and higher levels of positive affect. Incremental theorists demonstrate this mastery orientation because they believe that their ability can improve through effort. Entity theorists, in contrast, are vulnerable to the helpless response pattern. When confronting failure, helpless individuals make maladaptive self-attributions (e.g., “I’m failing because I’m stupid”), experience negative affect, and disengage from the task to avoid revealing their lack of ability. Previous research by Dweck and her colleagues provides support for the model and demonstrates that implicit self-theories have a powerful impact in the achievement domain, producing a coherent pattern of thoughts, feelings, and behaviors in response to the threat of failure (see Dweck, 1999; Dweck, Chiu, & Hong, 1995; Dweck & Leggett, 1988, for reviews).

The Present Study: Extending the Implicit Self-Theory Model

The present study extended Dweck’s model in several ways. First, we tested the model in a real-world achievement context, whereas most previous research supporting the model has been conducted in laboratory settings. Specifically, we investigated implicit self-theories of ability in a sample of young men and women followed through college. The college environment provides an ideal setting for examining the implications of implicit self-theories because achievement has important consequences for self-worth and the attainment of long-term life goals. The transition to college typically involves an increased sense of academic challenge and a corresponding heightened threat of failure. Consequently, college may be a time in which implicit self-theories are particularly influential for how individuals approach achievement situations. However, the laboratory context in which the model was developed differs from the college context in ways that may alter the implicit theory process. For example, goal orientation in a laboratory task may not have the same psychological antecedents as real-world achievement goals, which have long-term implications for one’s identity and life pursuits. Thus, it is important
to determine whether the processes and relations documented through laboratory research hold in a real-world achievement context.

One problem with testing the model in a real-world context is that we cannot establish the causal direction of effects. However, several laboratory studies support the causal relations proposed by the model. For example, Bempechat, London, and Dweck (1991) manipulated implicit self-theories and found that children in the Incremental condition were more likely than those in the Entity condition to choose learning goals than performance goals after having experienced failure. Similarly, Hong, Chiu, Dweck, Lin, and Wan (1999) found that individuals who were primed to have an Incremental orientation showed a mastery-oriented response by making effort attributions for failure and taking remedial action in the face of setbacks. Goal orientation has also been manipulated in the laboratory, and consistent with the model, the mastery-oriented response was evident in the learning goal condition and the helpless response was evident in the performance goal condition (Elliott & Dweck, 1988). Thus, previous research provides a solid basis for the theorized causal relations among implicit self-theories, goal orientations, and responses to failure.

Second, we investigated how Entity and Incremental theorists respond to academic success as well as failure, whereas previous research has focused exclusively on responses to academic failure. Dweck and Leggett (1988) have theorized that differences between the Entity and Incremental orientations will be the most pronounced under the threat of failure; however, this theoretical assumption has not been tested empirically (Harackiewicz & Elliot, 1995; Sorrentino, 1995). If the differences hold under conditions of success, then this would have important implications for the way implicit self-theories are conceptualized in achievement settings.

Third, we provide a test of the overall implicit self-theory model, whereas most studies have focused on only one link, such as the effect of goal orientation on response to failure (Elliott & Dweck, 1988). The model describes the interrelations among a set of variables that work together as a motivational and self-regulatory system, and is thus more appropriately tested in its entirety, rather than in a piecemeal fashion. A central component of the model is that implicit self-theories set in motion a series of processes that are causally linked while an individual is working on a task; for example, the belief that one’s ability is fixed contributes to a performance goal orientation which in turn contributes to a helpless response pattern. The series of mediated relations specified by the model has not been fully tested (see Hong et al., 1999, for experimental evidence that effort attributions mediate some of the effects of implicit theories). The present study uses path analysis to provide the first test of the full model. Although path analyses cannot establish causal effects, the present study will be able to determine whether the pattern of interrelations among the variables is consistent with the causal framework provided by the model.

Fourth, we examined the stability of implicit self-theories over time. Dweck has suggested that individuals have a stable predisposition toward either the Entity or Incremental orientation (Dweck et al., 1995). However, this assumption has not been tested empirically in adolescence or adulthood. The few studies of childhood have found low levels of stability, both in terms of normative (or mean-level) change (Bempechat et al., 1991; Pomerantz & Ruble, 1997) and the stability of individual differences (Pomerantz & Saxon, 2001).

Finally, we examined the relation between implicit self-theories and self-esteem. Implicit self-theories have typically been shown to be uncorrelated with self-esteem (e.g., Hong et al., 1999). However, it is possible that the implicit self-theories and the
frameworks of meaning they engender may have significant implications for the development of self-esteem over time. For example, Dweck and her colleagues have recently theorized that Entity theorists may have vulnerable self-esteem because their self-worth is contingent on external validation (Burhans & Dweck, 1995; Dweck, 1999; Molden & Dweck, 2000; Mueller & Dweck, 1998). To shed some light on this important issue, we tested whether implicit theories were associated with long-term change in self-esteem using growth curve modeling of self-esteem trajectories over four years of college.

Hypotheses

Stability of Implicit Self-Theories

We examined two types of stability: 1) normative (i.e., mean-level) stability from high school to the end of college and 2) consistency of individual differences over two years of college. In terms of normative stability, there seem to be countervailing forces at work. On the one hand, the competitiveness of the college achievement context may focus students on figuring out their ability level relative to their peers, which could promote an Entity orientation. On the other hand, the college achievement context may focus students on developing their interests and abilities, which could promote an Incremental orientation. A more likely possibility, we believe, is that Entity theorists will construe the college environment as a context in which to figure out their fixed ability level, whereas Incremental theorists will construe the college environment as a context in which to develop their ability. This pattern constitutes a reactive person-environment interaction in which individuals react differently to the same environment depending on their traits, beliefs, goals, and so on. In other words, the academic context simply reinforces individuals’ beliefs about their intelligence. Thus, we predicted that:

H1a: The college environment will not produce normative change.
H1b: Individual differences will be relatively consistent over time (i.e., individuals will maintain a similar rank ordering).

Testing the Implicit Self-Theory Model

The next set of hypotheses concern the cognitive, affective, and behavioral consequences of implicit self-theories in the academic domain.

Goal Orientation

Predictions regarding the relation of implicit self-theories to goal orientation follow directly from Dweck’s model. Individuals who believe their intelligence is fixed strive to prove and document the adequacy of their fixed level of ability, and thus focus on performance goals. In contrast, individuals who believe their intelligence is malleable strive to develop their ability through learning and mastery, and thus focus on learning goals. Thus, we predicted:

H2a: Entity theorists will tend to adopt performance goals.
H2b: Incremental theorists will tend to adopt learning goals.

Attributions

Achievement attributions are a central cognitive component of the helpless and mastery-oriented responses to failure. Entity theorists are prone to the helpless
response pattern and therefore their achievement attributions should reflect the attributional style associated with learned helplessness (Seligman, Abramson, Semel, & Von Baeyer, 1979). Incremental theorists, in contrast, believe they can exercise control over academic outcomes. Thus, we predicted that:

H3a: Entity theorists will attribute their failure to internal, uncontrollable causes (e.g., ability).
H3b: Incremental theorists will make effort attributions for both success and failure.

It is important to note that although these predictions are consistent with the learned helplessness model, Dweck’s model does not make predictions about the way Entity and Incremental theorists explain academic success, nor is there any previous research on this question.

**Affective Responses**

Dweck’s model suggests that Entity and Incremental theorists will have different emotional reactions to their academic performance. Entity theorists, being vulnerable to the helpless pattern, will be more likely to feel ashamed and distressed in academic contexts, and should experience more negative affect. Having a mastery orientation, Incremental theorists will be more likely to feel inspired and determined, and should experience more positive affect. These reactions will be independent of any differences in their actual performance. Thus, we predicted that:

H4a: Entity theorists will be prone to negative achievement-related emotions.
H4b: Incremental theorists will be prone to positive achievement-related emotions.

**Behavioral Response to Challenge**

According to Dweck’s model, Entity and Incremental theorists behave differently when they are confronted with challenging achievement situations, which are an inevitable part of the college experience. Specifically, Entity theorists should be inclined to show a helpless response in which they give up and become discouraged when challenged, whereas Incremental theorists should be more likely to show a mastery-oriented response in which they persist and try even harder. Thus, we predicted that:

H5a: Entity theorists will report engaging in helpless achievement behaviors.
H5b: Incremental theorists will report engaging in mastery-oriented achievement behaviors.

**Moderator Effects: Academic Self-Confidence and Perceived Performance**

Dweck and Leggett (1988) speculated that Entity theorists might not show the helpless response pattern when they are confident in their abilities. However, Hong et al. (1999) failed to find that self-confidence moderated the effects of implicit self-theories. It is possible that Entity theorists’ may always be at risk for falling into the helpless pattern because their confidence can fluctuate easily due to the perceived implications of failure (e.g., “I’m not smart enough to succeed”; Dweck, 1999; Hong et al., 1999). With regard to perceived performance, Dweck and Leggett (1988) suggested that Entity and Incremental might differ only in their reactions to failure, and that all individuals might be mastery-oriented when experiencing success. However, college is a highly challenging context that entails the constant threat of failure—a threat that may override many actual successes—and it is possible that Entity theorists will demonstrate the helpless response pattern regardless of their
performance. Even Entity theorists who acknowledge some successes may attribute their achievements to luck, fail to feel pride in their accomplishments, focus more on their failures, and so on. Given these various considerations, we explored the potential moderating effects of academic self-confidence and perceived performance when testing all hypotheses.

**Implicit Self-Theories and Long-Term Self-Esteem Change**

Although the implicit self-theory model does not specifically address the question of self-esteem change, Entity and Incremental theorists are theorized to have different sources of self-esteem (Dweck & Leggett, 1988): Entity theorists derive self-esteem from proving that their ability level is adequate, whereas Incremental theorists derive self-esteem from working hard and mastering challenging tasks. Building on this idea, more recent theory and research on implicit self-theories has suggested that Entity theorists’ are at risk for developing contingent self-worth because they are preoccupied with proving their ability level through attaining success and avoiding failure (Burhans & Dweck, 1995; Dweck, 1999; Molden & Dweck, 2000; Mueller & Dweck, 1998; see Crocker & Wolfe, 2001, for a review of research on contingent self-worth). Failure is therefore expected to be particularly painful and debilitating for Entity theorists because it is viewed as an indictment of one’s worth as a person. Consistent with this idea, Entity theorists have been shown to make global statements reflecting feelings of worthlessness following failure (Burhans & Dweck, 1995).

What are the implications of the link between the Entity orientation and contingent self-worth for self-esteem change over time? We expected that experiencing failure in such globally self-evaluative terms may chip away at the self-esteem of the Entity theorist over time, particularly in college where the experience of failure is likely (almost every student in our sample received lower grades in college than they did in high school). Moreover, failure may be more salient than success to Entity theorists. For example, the proposed helpless attributional pattern of explaining failure in terms of lack of ability and success in terms of external forces would make the self-esteem of Entity theorists more linked to failure than to success. Incremental theorists, in contrast, should be buffered against decrements in self-esteem because failure is not viewed as indicative of low ability but rather as useful feedback that inspires them to master the challenge and improve themselves. Thus, we predicted:

H6: Entity theorists will decrease in self-esteem relative to Incremental theorists.

**Method**

**Sample and Procedure**

This research uses data from the Longitudinal Study of Self and Personality Development, an ongoing study designed to examine the development of self-esteem and personality during college (Robins & Beer, 2001; Robins, Hendin, & Trzesniewski, 2001). The sample includes 508 undergraduate students who entered the University of California at Berkeley in 1992. The sample is diverse in terms of ethnicity (43% Asian, 36% Caucasian, 13% Chicano/Latino, 7% African American, 1% American Indian), sex (56% female), socioeconomic status (20% came
from families with household incomes below $25,000 and 20% from families with household incomes above $100,000), and academic ability (combined SAT scores ranged from 650 to 1540, $M = 1183$, $SD = 181$).

Participants were recruited during the first week of their first year of college, and then assessed annually throughout college. Participants were contacted by mail and asked to complete an extensive questionnaire in exchange for money (the financial incentive ranged from $6 to $20). Six assessments were conducted over a four-year period: first week of college ($N = 508$), end of the first semester ($N = 455$), end of the first ($N = 306$), second ($N = 260$), third ($N = 200$), and fourth ($N = 303$) years of college. Implicit self-theories were measured in Years 2, 3, and 4. 363 participants completed the implicit self-theory measure at least once. Participants differed from non-participants only in their college GPA ($Ms = 3.2$ vs. 2.9, $t = 5.2$, $p < .05$), and sex (61% vs. 41% female, $t = 3.6 p < .05$).

**Measures**

**Implicit Self-Theories**

We used a five-item scale adapted from Erdley and Dweck (1993) to assess implicit self-theories: “I have a certain ability level, and it is something that I can’t do much about”; “I can change the way I act in academic contexts, but I can’t change my true ability level”; “I can learn new things, but how intelligent I am stays pretty much the same”; “I can do things to perform better in school, but I can’t change my real ability”; “My ability is something about me that I can’t change very much”. Items were rated on a 1 (not very true of me) to 5 (very true of me) scale. The scale was administered to the longitudinal sample in years 2 ($\alpha = .87$), 3 ($\alpha = .90$), and 4 ($\alpha = .90$).

To examine normative change in implicit self-theories over the transition from high school to college, we administered the five-item implicit self-theory scale to two additional samples: a sample of 369 high school seniors (53% female) who were attending an orientation program the summer before beginning college and a cross-sectional sample of 334 college students (62% female). The high school students completed the scale ($\alpha = .86$) using the same five-point response format as the participants in the longitudinal study; the college students completed the scale ($\alpha = .85$) using a seven-point response format ranging from 1 (strongly disagree) to 7 (strongly agree). In the present study we analyzed the implicit self-theory scale as a continuous variable to avoid the loss of power associated with typologizing a dimensional variable (Cohen, 1983). However, to facilitate communication of the findings we often describe the results in terms of differences between Entity and Incremental theorists, reflecting individuals who are relatively high vs. low on the Entity scale.

**Academic Ability, Actual and Perceived Performance, and Self-Confidence**

Academic ability was assessed by standardized test scores (SAT-Verbal and SAT-Math scores) and high school GPA. Actual performance was assessed by cumulative college GPA obtained from university records. Perceived performance was assessed in Years 2, 3, and 4 by participants’ responses to the following question: “Based on your own personal standards, would you consider your academic performance last semester a success or a failure?” This item was rated on a four-point scale: 1 (clearly a failure), 2 (somewhat of a failure), 3 (somewhat of a success), 4 (clearly a success).

Academic self-confidence was assessed using a standardized composite of seven items ($zs = .82$, .87, and .85 for Years 2–4, respectively), tapping two facets of
perceived ability: direct self-reports of ability (e.g., “Compared to the average UC Berkeley student, how would you rate your academic ability?”) and performance expectations (e.g., “Realistically, what overall GPA do you think you will attain?”). Perceived performance and academic self-confidence will be tested as moderators of the effects of implicit self-theories. The present study has greater than 80% power ($\alpha = .05$) to test for small main effects and moderate interaction effects (Aiken & West, 1991, Table 8.5).

**Goal Orientation**

Performance goal orientation was assessed with five items administered in Years 2, 3, and 4, and one item administered in Year 4 only; the items were composited over time to form a reliable scale ($z = .84$). A sample item is “Exams are stressful because I may not achieve the grade I want.” Learning goal orientation was assessed with one item administered twice during the first semester, 3 items administered in Years 2, 3, and 4, and one item administered in Year 4 ($z = .78$). A sample item is “The knowledge I gain in school is more important than the grades I receive.” The performance and learning goal scales correlated $-.16$.

**Causal Attributions for Academic Achievement**

Achievement attributions were measured in two ways. First, participants completed the 24 achievement items from the Multidimensional-Multiattributational Causality Scale (MMCS; Lefcourt, von Baeyer, Ware, & Cox, 1979) during their first year in college. The MMCS assesses causal attributions to two internal factors (ability, effort) and two external factors (situation, luck), separately for success and failure experiences. The MMCS is a measure of general attributional style and is based on causal attributions for hypothetical or abstract achievement situations (e.g., “When I get good grades, it is because of my academic competence”). Second, participants made causal attributions for their actual college achievement in Years 2, 3, and 4. Specifically, they were asked to “Rate how important you think each of the following factors was in determining the grades you received last semester”: your ability, the amount of effort you put into school, your study skills (i.e., ability to study effectively), luck, the ability of other students, the difficulty of the classes you took, pressure from others (e.g., parents) to perform well. Items were rated on a 1 (not at all important) to 5 (very important) scale.

**Affective Response to Academic Achievement**

Participants rated how they felt about their academic performance using 12 items from the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). Specifically, participants were asked to “Use the following words to describe how you feel when you think about your college GPA.” Items were rated on a five-point scale: 1 (very slightly), 2 (a little), 3 (moderately), 4 (quite a bit), 5 (extremely). Unit weighted scales were computed from the six positive emotions (proud, excited, strong, inspired, determined, enthusiastic; alphas were .85, .88, and .90 for Years 2–4, respectively) and the six negative emotions (upset, scared, hostile, ashamed, guilty, distressed; alphas were .87, .89, and .91 for Years 2–4, respectively). The Positive Affect and Negative Affect scales correlated $-.51$.

**Helpless and Mastery-Oriented Behavioral Response**

The helpless behavioral response was assessed with a four-item scale ($zs = .69, .73,$ and $.75$ for Years 2–4, respectively). A sample item is “When I fail to understand
something, I become discouraged to the point of wanting to give up.” The mastery-oriented behavioral response was assessed with a four-item scale ($z = .74, .75, .68$ for Years 2–4, respectively). A sample item is “When something I am studying is difficult, I try harder.” Items were rated on a 1 (not very true of me) to 5 (very true of me) scale. The helpless and mastery-oriented behavior scales correlated −.66.

### Self-Esteem Change

Participants completed the 10-item Rosenberg (1965) Self-Esteem scale in all six assessments from the beginning to the end of college ($z$ ranged from .88 to .90), allowing us to examine change in self-esteem over four years. Items were rated on a 1 (not very true of me) to 5 (very true of me) scale. To examine change in self-esteem, we used growth curve modeling with ordinary least squares regression (Rogosa, 1995; Willett, 1988; see also, McFadyen-Ketchum, Bates, Dodge, & Petitt, 1996, Appendix). Specifically, for each participant we regressed self-esteem scores on assessment period (centered at the midpoint of college). Positive slopes (i.e., standardized beta weights) indicate increases in self-esteem over four years of college and negative slopes indicate decreases in self-esteem. The y-intercept represents the participant’s mean self-esteem level averaged across the four-year period. By modeling individual trajectories over multiple waves of data, growth curve modeling provides a more reliable index of change than difference or residual scores. Growth curve modeling also provides a more flexible way of dealing with missing data because trajectories are computed using all available data for each participant.

### Results and Discussion

#### Stability of Implicit Self-Theories During College

**Mean-Level Change**

Overall, participants did not show a general tendency to increase or decrease on the Entity orientation scale. None of the means differed significantly from each other (all $t < 1.2$, n.s.); the means were $2.66$ ($SD = .93$) for the high school sample, and $2.70$ ($SD = .92$), $2.74$ ($SD = .94$), and $2.66$ ($SD = .90$), for Years 2, 3, and 4 of the longitudinal study, respectively. There were no sex differences at any age (all $t < 1$).

Findings from the second sample of college students also failed to reveal any mean-level differences in implicit theories across the college years. Analyses of the cross-sectional data showed no main effect of year in college ($F < 1$). There were no sex differences at any age (all $t < 1$). Mean scale scores (7-point response format) were $3.81$ ($SD = 1.32$) for 196 first-year students, $3.84$ ($SD = 1.10$) for 98 second-year students, and $3.96$ ($SD = 1.36$) for 40 third- and fourth-year students. Thus, as predicted by Hypothesis 1a, the college experience does not seem to produce normative mean-level change in implicit self-theories.

**Consistency of Individual Differences**

To examine whether individuals maintain the same relative level of implicit theories over time, we correlated Entity scale scores between each of the three assessments. The correlations (and correlations disattenuated for unreliability) were high across the entire period: $$.63$ ($$.72$) for Year 2 to Year 3, $$.67$ ($$.74$) for Year 3 to Year 4, and $$.57$ ($$.64$) for Year 2 to Year 4. There were no sex differences in the magnitude of the correlations. The level of stability in the present study was significantly higher than the one-year stability correlation ($r = .31$) reported by
Pomerantz and Saxon (2001) in their study of 4th to 6th grade students \((p < .05, z\text{-test for the difference between independent correlations})\). This difference was not due to age differences in the reliability of the Entity orientation scale; in the Pomerantz and Saxon study, the disattenuated correlation was .40. This suggests that implicit self-theories may become more stable from childhood to adolescence and adulthood. Thus, consistent with Hypothesis 1b, individuals who believe that they can (or cannot) increase their intelligence tend to maintain this orientation during college. In summary, the notable absence of mean-level change, coupled with evidence of consistent individual differences, supports the assumption that implicit self-theories are stable beliefs.

**Testing the Implicit Self-Theory Model: Implications for Achievement-Related Thoughts, Feelings, and Behaviors**

We next examined hypotheses concerning the implications of these stable beliefs for achievement-related thoughts, feelings, and behaviors. We tested these hypotheses concurrently rather than longitudinally. For example, we tested whether Entity theorists tend to have performance goals, not whether Entity orientation predicts change in goal orientation from Year 2 to 4. Thus, we report results using data aggregated across Years 2–4. This approach is justified for several reasons. First, aggregating the data simplifies presentation of the findings, increases the reliability of the measures, and reduces the effects of attrition. Second, both implicit self-theories and the other variables in the model were relatively stable over time. Third, the concurrent effects of implicit self-theories were similar in magnitude across Years 2, 3, and 4, and to the aggregated results we report below.

Fourth, and perhaps most important, we do not believe that longitudinal analyses are conceptually appropriate in the present case. The implicit self-theory model describes the causal relations among a motivational system and not a developmental process. This motivational system is formed during childhood (Cain & Dweck, 1995; Dweck, 1999). By college, the constructs comprising the model constitute a system in which the causal links have already been established and are repeatedly enacted in challenging achievement-related situations. Thus, the implicit self-theory model does not describe a developmental process that unfolds over the course of college. For example, one would not predict that Entity theorists would become progressively more performance goal oriented during college, but rather that having an Entity orientation carries with it the immediate press for performance goals, which then generate a helpless response whenever the Entity theorist faces academic challenge.

We also conducted a series of multiple regression analyses to test whether sex, perceived performance, or academic self-confidence moderated the relation between implicit theories and any of the dependent variables. In each of these analyses, we first entered the main effects of Entity orientation and the potential moderator variable (sex, perceived performance, or academic self-confidence) and then entered the cross-product of their standard scores to represent the interaction.

**Academic Ability, Actual and Perceived Performance, and Self-Confidence**

Entity and Incremental theorists did not differ in perceived performance (success vs. failure) \((r = -.09, p < .10)\) or in academic self-confidence \((r = -.09, p < .10)\), although in both cases there was a trend for Incremental theorists to be higher. Entity theorists had higher SAT scores \((r = .20, p < .05)\), but not better grades.
(r = .03 with high school GPA and .03 with college GPA). These relations were not moderated by sex. In summary, Entity theorists had higher academic ability, but this did not translate into higher achievement.

**Goal Orientation**

Consistent with Hypotheses 2a and 2b, Entity theorists emphasized performance goals (r = .31, p < .05), whereas Incremental theorists emphasized learning goals (r = -.25, p < .05). Thus, individuals with a fixed view of their intelligence are oriented toward performance goals that help them prove their ability level. In contrast, individuals who believe they can get smarter are oriented toward learning goals that help them increase their ability level. These relations were not moderated by sex or academic self-confidence (betas for the interaction term ranged from -.02 to .06, n.s.). Perceived performance did not moderate the relation between implicit self-theories and learning goals (beta = -.02, n.s.), but it did moderate the relation with performance goals (beta = -.17, p < .01), such that the relation between Entity orientation and performance goals was stronger for perceived failure than for perceived success (beta = .48 at 1 standard deviation below the mean on the perceived performance scale, beta = .31 at the mean, and beta = .14 at 1 standard deviation above the mean). It is important to note that this interaction effect reflects a difference only in the magnitude of the relation between implicit self-theories and performance goals; regardless of their perceived performance, Entity theorists tend to endorse performance goals.

**Achievement Attributions**

We first tested our hypotheses using the MMCS, a measure of general attributional style. As predicted, Entity theorists tended to make ability attributions for failure (r = .19, p < .05) and external, uncontrollable attributions for both failure (r = .12 for situation and .12 for luck, p < .05) and success (r = .20 for situation and .17 for luck, ps < .05). Entity theorists were not more likely to make ability attributions for their success (r = .04, n.s.) This pattern of correlations is consistent with the helpless response. Incremental theorists, in contrast, tended to attribute success to effort (r = -.24, p < .05), which is consistent with the mastery-oriented response. However, contrary to predictions, Incremental theorists did not attribute failure to lack of effort (r = -.01, n.s.). These relations were not moderated by academic self-confidence (betas for the interaction terms ranged from -.08 to .09, n.s.) or by sex, with the exception of effort attributions (beta = -.11, p < .05).

We next examined causal attributions for real-world achievement outcomes (i.e., college performance). To make the findings consistent with the MMCS analyses, we used multiple regression analyses to examine the relation between implicit self-theories and causal attributions, taking into account the interaction between implicit self-theories and perceived performance (success vs. failure). As predicted, and consistent with the findings for the MMCS scales, Entity theorists were more likely to make ability attributions (beta = .14, p < .05) and this relation was moderated by perceived performance (beta = -.14, p < .05); that is, Entity theorists were more inclined to make ability attributions for failure (beta = .28 at 1 standard deviation below the mean) than for success (beta = .00 at 1 standard deviation above the mean). Also as predicted, Incremental theorists were more inclined to make effort attributions (beta = -.10, p < .05) and this relation was not moderated by perceived performance (beta = -.01, n.s.); note that this is in contrast to the MMCS findings in which the relation between Incremental orientation and effort held for success but
not for failure. Incremental theorists also tended to make attributions to study skills (beta = −.12, p < .05); this finding seems linked to effort attributions—it is not just how much effort that is exerted, but how that effort is applied.

Finally, consistent with predictions, Entity theorists tended to make external attributions for their college achievement—the Entity scale had a positive relation with luck attributions (beta = .11, p < .05), as well as attributions to class difficulty (beta = .12, p < .05) and the ability of other students (beta = .11, p < .05); these relations were not moderated by perceived performance (betas of interaction effects ranged from −.02 to .02, n.s.). Academic self-confidence did not moderate any of the attribution effects (betas ranged from −.05 to .06, n.s.). However, sex moderated the relation between Entity orientation and attributions to class difficulty (beta = .15, p < .01), such that this relation held for females (beta = .24, p < .05) but not for males (beta = −.08, n.s.).

Overall, the findings generally replicated across the MMCS attributional style scales and the real-world achievement attributions. Entity theorists showed a helpless response in academic situations: They think they fail because they lack sufficient ability but they do not think they succeed because of their high ability. In addition, they explain academic achievement—both success and failure—in terms of external factors beyond their control. Entity theorists believe they succeed because they are lucky, not because they are smart or exert a lot of effort. It is noteworthy that all of the factors emphasized by Entity theorists—ability and external causes—are uncontrollable, which is consistent with Dweck’s (1999; see also Pomerantz & Ruble, 1997) most recent conception of the Entity orientation. Thus, they are truly helpless and assume that both their successes and failures are out of their control. In a sense, Entity theorists are caught in a trap: They strive for academic success to prove they have high ability, yet they explain away their successes as due to luck. Incremental theorists, in contrast, show a mastery-oriented response: They explain their academic performance in terms of internal, controllable factors such as effort and study skills. Thus, when Incremental theorists think they failed, they believe they just need to try harder or use better study strategies to perform better. Moreover, they do not believe luck plays an important role in their success, but rather view their success as a result of hard work. Thus, the findings extend Dweck’s model by showing that the achievement dynamics of the helpless and mastery-oriented responses hold regardless of whether individuals perceive their academic achievements in a positive or negative light.

**Affective Responses to Academic Achievement**

Despite not differing in the grades they received, Entity theorists were more likely to feel distressed (r = .12), ashamed (r = .11), and upset (r = .09) about their academic performance (r = .14, p < .05, with the Negative Affect scale), whereas Incremental theorists were more likely to feel determined (r = −.14), enthusiastic (r = −.14), excited (r = −.13), inspired (r = −.11), and strong (r = −.10), all ps < .05 (r = −.14, p < .05, with the Positive Affect scale). The correlations with the remaining PANAS items were in the predicted direction but non-significant (rs = −.08 with proud, .07 with guilty, .03 with scared, and .02 with hostile). The overall pattern, which is consistent with Hypotheses 4a and 4b, reflects the negative affective response associated with the helpless Entity theorists, and the positive affective response associated with the mastery-oriented Incremental theorists. These relations were not moderated by sex, academic self-confidence, or perceived performance (betas for the interaction terms ranged from −.07 to .09, n.s.).
**Behavioral Response to Challenge**

The implicit theory model predicts that Entity theorists respond to challenge by giving up whereas Incremental theorists respond to challenge by trying even harder. Consistent with Hypotheses 5a and 5b, the Entity scale correlated .48 ($p < .05$) with the helpless response scale and $- .39$ ($p < .05$) with the mastery-oriented response scale. These relations were not moderated by sex, academic self-confidence, or perceived performance (betas for the interaction terms ranged from $- .04$ to $.05$, n.s.), except that perceived performance moderated the relation between Entity orientation and helpless behaviors (beta for the interaction term $= -.10$, $p < .05$). The relation was stronger for perceived failure than for perceived success (beta $= .56$ at 1 standard deviation below the mean of the perceived performance scale, .46 at the mean, and .36 at 1 standard deviation above the mean).

**Self-Esteem Change**

The findings reported thus far all point to a single conclusion: Entity theorists approach achievement situations in ways that make them more psychologically vulnerable in the academic environment. We expect the implicit self-theory process, as it plays out repeatedly during the college years, to have cumulative implications for self-esteem over the long-term. The longitudinal design of the study allowed us to test the hypothesis that Entity theorists show a drop in self-esteem as they face new academic challenges and experience self-worth threatening failures. Growth curve modeling was used to measure individual differences in self-esteem change over four years of college.

On average, Entity theorists had lower self-esteem than Incremental theorists across the four-year period ($r = -.29$ with y-intercept, $p < .05$), and were on a downward trajectory relative to Incremental theorists ($r = -.22$ with self-esteem slope, $p < .05$). The correlation with self-esteem change held when we controlled for the y-intercept ($r = -.19$, $p < .05$); that is, the tendency for Entity theorists to decrease in self-esteem relative to Incremental theorists was independent of differences in their average level of self-esteem during college. None of these relations were moderated by sex, perceived performance, or academic self-confidence (betas ranged from .00 to .08, n.s.). Thus, the self-esteem gap between Entity and Incremental theorists widened during college.

**Path Analysis**

In this section, we used path analysis to test the overall implicit self-theory model, including our extension of the model to long-term change in self-esteem. This analysis links implicit self-theories, goal orientation, three aspects of the helpless versus mastery pattern (attribute, affect, behavioral response), and self-esteem change. Given the large number of variables involved, we created a set of composite measures to simplify the model. First, we created a composite measure of helpless behavioral response by combining the helpless behavior scale and the mastery-oriented behavior scale (reverse scored). Second, we created a composite measure of helpless affective response by combining the negative affect scale and the positive affect scale (reverse scored). Third, we created a composite measure of helpless attributions using the set of real-world attributions; specifically, we positively scored attributions to the three causes reflecting a lack of control over achievement outcomes (luck, ability of other students, task difficulty) and reverse scored attributions
to the two controllable causes (effort, study skills). Ability attributions were more complicated to score because of the interaction between Entity orientation and perceived performance; based on the results of the moderated multiple regression analysis reported previously, we positively scored ability attributions for individuals whose perceived performance was below the median, and weighted ability attributions zero for individuals whose perceived performance was above the median. This weighting is also consistent with the theoretical conception of the helpless attributional pattern, which includes ability attributions for failure but not ability attributions for success. Table 1 shows the intercorrelations among all of the variables included in the path model.

The specification of the relations among the variables in the path model was guided by Dweck’s theory, as well as related theories of achievement and motivation (e.g., Bandura, 1986; Covington, 1992; Stipek, 1993; Weiner, 1985). A central assumption of Dweck’s model is that the helpless and mastery-oriented responses derive from the differing goal orientations of Entity and Incremental theorists. In other words, Entity theorists become helpless in part because they adopt performance goals and in part because they tend not to adopt learning goals. Thus, according to Dweck’s model, goal orientation should precede the helpless response pattern, including the cognitive (helpless attribution), affective (helpless affect), and behavioral (helpless behavioral) aspects. Although predicted by Dweck’s model, we do not know whether the correlates of implicit self-theories are mediated by goal orientation or whether they shape responses to the achievement context independently of their relation with goal orientation.

According to Weiner’s (1985) attribution model, achievement attributions influence affective and behavioral responses to academic outcomes. Similarly, the learned helpless model assumes that a perceived lack of control (e.g., attributions to luck and other uncontrollable factors) contributes to the learned helplessness pattern. This suggests paths from achievement attributions to the affective and behavioral response variables. Both research and theory also suggest that the helpless behavioral response follows from how individuals feel about their performance; that is, positive affect contributes to increased effort whereas negative affect contributes to helpless behaviors. This suggests a path from affect to behavioral response. Finally, we assumed that the helpless response pattern would be maladaptive in the challenging achievement context of college and would lead to decreasing self-esteem over the course of college. Thus, we set up the model to test whether the relation

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<tr>
<td>1. Entity orientation</td>
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<td>2. Performance goals</td>
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<td>3. Learning goals</td>
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<td>4. Helpless attributions</td>
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<td>5. Negative affect</td>
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<td>6. Helpless behavioral response</td>
<td>.48*</td>
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<td>7. Increase in self-esteem</td>
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*p < .05.
between Entity orientation and self-esteem change was mediated by the entire implicit theory process.

We first tested a path model in which the effects of implicit self-theories were fully mediated through goal orientation and the three components of the mastery versus helpless response patterns; specifically, Entity orientation had paths only to learning and performance goals, learning and performance goals had paths only to attributions, and there was a single path connecting attributions to affect, affect to behavioral response, and behavioral response to self-esteem change. This model provides the most stringent test of the assumption that implicit theories exert their influence through goal orientation and that the remaining effects in the model are all mediated through other variables. Although all of the paths in this fully mediated model were significant, the model was rejected according to the chi-square test, $\chi^2 (df = 14, N = 353) = 188$, $p < .05$, and the goodness of fit indices indicated relatively poor fit (Comparative Fit Index = .58, Normed Fit Index = .57).

We next tested a model that allowed performance and learning goals to directly effect all three helpless vs. mastery variables (attributions, affect, behavioral response), and that in turn allowed the three helpless vs. mastery variables to directly effect self-esteem change. This model led to significantly better fit as indicated by a chi-square test of the difference between the first and second models ($p < .05$). However, the model was still rejected according to a chi-square test, $\chi^2 (df = 8, N = 353) = 74$, $p < .05$, and the goodness of fit indices were only marginally adequate (CFI = .84, NFI = .83). One reason this model did not fit well is that Entity orientation had several significant paths that were not entirely mediated by goal orientation. Thus, the theoretical assumption that the relation between implicit self-theories and the other variables in the model are mediated by goal orientation received only partial support.

Finally, we tested a model that allowed for direct relations between implicit theories and the helpless response pattern and self-esteem change (i.e., relations that were not mediated by goal orientation). Statistically significant ($p < .05$) paths were added and statistically insignificant paths were deleted. This model led to a significant improvement in fit over the second model ($p < .05$), and an acceptable level of fit (CFI = .98; NFI = .97); a chi-square test indicated that the model should not be rejected; $\chi^2 (df = 6, N = 353) = 12$, $p > .05$ (It is important to note that models based on other theories may fit the data just as well, but our goal was to provide an explicit test of Dweck’s model.).

Figure 1 shows the standardized partial regression coefficients for the final (third) path model. Overall, the model supports the basic assumptions of Dweck’s model. All of the hypothesized paths were significant. Entity orientation was related to both performance and learning goals, which were each related to the three aspects of the helpless pattern (attributions, negative affect, behavioral response). Helpless attributional style was associated with heightened negative affect, which in turn was associated with giving up in the face of challenge. Both negative affect and helpless behavioral response were associated with decreasing levels of self-esteem over time.

Many of the relations between Entity orientation and the other variables in the model were partially or entirely mediated by goal orientation. In particular, Entity orientation was not significantly associated with affective response, except through its relation with goal orientation. This is consistent with Dweck’s model, which specifies that Entity theorists show a negative emotional response to their academic achievement because they tend to adopt performance goals and tend not to adopt learning goals. Similarly, the relation between Entity orientation and self-esteem
change was entirely mediated by the implicit self-theory process. Although the present study cannot conclusively establish causal effects, the findings suggest that Entity theorists decline in self-esteem during college because they pursue performance rather than learning goals and because they show a helpless cognitive, affective, and behavioral response to academic challenge. In contrast to the mediated relations found for affect and self-esteem change, Entity orientation had non-mediated relations with helpless attributions and helpless behavioral response. Specifically, Entity theorists tended to respond cognitively and behaviorally in a helpless way to academic outcomes independently of their tendency to adopt performance goals and experience negative emotions. Thus, goal orientation is indeed an important mediator in the process model, as Dweck has argued, but it is also the case that the Entity orientation influences helpless versus mastery responses independently of goal orientation.

**General Discussion**

The present research explored a number of basic questions about implicit self-theories in the college context, and tested several hypotheses that derive from and extend Dweck’s model. The findings show that whether an individual believes that intelligence is fixed or changeable has important implications in the academic domain. Specifically, Entity theorists perceive, explain, and react to their academic successes and failures differently than Incremental theorists. Below we review the main findings and discuss their contribution to our understanding of Dweck’s model, as well as their implications for the study of self-esteem change.

**Stability of Implicit Self-Theories**

The findings support the claim that implicit self-theories of intelligence are stable, psychologically meaningful constructs. Data from the cross-sectional and longitudinal samples did not show any mean-level change from the senior year in high
school to the end of college. Thus, the college experience does not seem to produce normative change in implicit self-theories, despite a dramatic shift in what Hornuth (1990) referred to as the "ecology of the self." Together with previous research on children (Bempechat et al., 1991; Pomerantz & Ruble, 1997), the findings suggest that the average level of endorsement of the Entity orientation remains fairly stable over time.

Longitudinal analyses showed that individual differences in implicit self-theories are also relatively stable during college. In fact, the correlations over time found in the present study were significantly higher than those found in previous research on children (Pomerantz & Saxon, 2001). This suggests that implicit beliefs about intelligence may become more schematized as children move into adolescence, which would promote more stable individual differences. However, it is not clear whether this stability holds across developmental transition points such as the transition to junior high school or to college because we did not measure implicit self-theories longitudinally from high school to college. Our findings also do not address the conditions under which implicit self-theories change; the fact that implicit self-theories show no mean-level change and relatively high stability over time does not preclude the possibility of systematic change at the individual level. Therefore, an important future direction is to examine factors that promote an Entity versus an Incremental orientation. For example, Kamins and Dweck (1999) suggested that feedback focused on the child could be the origins of the Entity orientation and that feedback focused on the process could be the origins of the Incremental orientation.

Implications of Implicit Self-Theories for Achievement-Related Thoughts, Feelings, and Behaviors

The present findings extend the implicit self-theory model to a real-world context and support the generalizability of relations previously established in laboratory research. For the most part, the relations specified by the model held in the college environment and reveal a number of ways in which implicit self-theories may importantly shape how individuals experience and react to the achievement context. Implicit self-theories were related to the goals individuals pursue in college as well as to their attributions, emotions, and behavioral responses to challenging academic circumstances. With respect to goal orientation, Entity theorists adopted performance goals, presumably in an effort to prove or document their fixed ability level, whereas Incremental theorists adopted learning goals, presumably in an effort to improve or increase their malleable ability level. Thus, implicit theories are associated with real-world achievement goals and not just the goals individuals pursue in experimental settings.

Several of the findings point to the maladaptive nature of the Entity orientation in the college achievement context. Entity theorists show a generally helpless pattern rather than the mastery-oriented pattern shown by Incremental theorists. Specifically, Entity theorists blamed their failure on low ability yet explained away their success by attributing it to luck. Emotionally, they felt more distressed about their academic performance and were less likely to feel determined and inspired, despite performing as well as Incremental theorists. Behaviorally, Entity theorists reported that they give up in challenging situations. Finally, Entity theorists generally had lower self-esteem than Incremental theorists, and this disparity widened over four years of college. All of these relations either confirm explicit predictions of the
implicit self-theory model or support the broader theoretical framework outlined in Dweck’s social-cognitive model of personality and motivation.

Interestingly, the associations between Entity orientation and the other variables in the model were not moderated by academic self-confidence, which is consistent with recent empirical findings (Hong et al., 1999). Thus, self-confidence may not buffer Entity theorists from the helpless pattern as originally theorized. Even if a high level of confidence may at first help Entity theorists respond adaptively in achievement situations, this confidence could be so fragile when confronting the constant threat of failure that the helpless pattern eventually takes over (Dweck, 1999).

In most cases, the relations between Entity orientation and the other variables in the model were not moderated by perceptions of success and failure. Thus, the helpless pattern characterizing Entity theorists’ reactions to the academic context held even when they thought they performed well. The few moderator effects we did find supported the notion that Entity theorists respond in a helpless way. For example, the relations between Entity orientation and performance goals and helpless behavioral responses were stronger in failure, but these relations also held in success. Although the association between Entity orientation and ability attributions held only for failure, this is consistent with an overall helpless response pattern: Entity theorists blame their failure on low ability but they do not take credit for success, thus demonstrating how helplessness pervades the experience of the Entity theorist regardless of perceived performance level.

Overall, the findings show that the implications of implicit self-theories are similar for success and failure. This is informative given that the implicit self-theory model was developed in a series of experiments in which individuals either experience failure or confront a challenging task in which failure is likely. It makes sense that Incremental theorists would adopt learning goals and show a mastery-oriented response in success as well as failure, but why does the maladaptive helpless pattern emerge for Entity theorists even when they think they are performing relatively well? One possibility is that the achievement context of college is more ego involving than tasks encountered in a lab study. The higher level of ego-involvement characterizing the college environment may trigger the helpless pattern even when performance levels are satisfactory. In a sense, college is a self-esteem threatening context that resembles the “high challenge” or “threat of failure” condition of lab studies on implicit self-theories.

A second possibility is that the meaning of perceived performance in the real world may differ from its meaning in the experimental context. In the lab, individuals experience either success or failure, whereas in the real-world individuals often experience both successes and failures. Although real-world research loses the control of manipulating success and failure, it has greater ecological validity because individuals are able to construe their actual academic experiences in ways that are personally meaningful to them and reflect long-term patterns of performance, rather than as isolated instances of success or failure. Consistent with this reasoning, Dweck et al. (1995) has argued that Entity theorists may disproportionately emphasize their failures over their success: “Even a single failure, despite many prior successes, may be enough to govern their self-judgments” (p. 275). Thus, experiencing a success in life does not suddenly lead the Entity theorist to feel optimistic and positive. Instead, success is reacted to—cognitively, affectively, and behaviorally—in such a way that the helpless pattern persists. In general, our findings support the notion that the way a person thinks about and reacts to achievement is crucial, not the simple perception of success versus failure. It would be useful to complement the
present study with experimental research on implicit theories in which multiple successes and failures are manipulated.

**Putting it All Together: Testing the Implicit Self-Theory Model as a System**

In addition to testing simple correlations between implicit self-theories and the other variables in the model, we conducted path analyses to test the complete model as a system of interconnected variables. The results generally support the implicit self-theory model, and suggest several important conclusions. First, the effects of Entity orientation were mediated through both performance and learning goals. This implies learning and performance goals should not be treated as two sides of the same general goal orientation. Most experimental research in this area has manipulated performance versus learning goal orientation whereas our findings suggest that in real world contexts these two orientations are not mutually exclusive and make independent contributions to psychological outcomes (Eppler & Harju, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997). In the present case, the maladaptive consequences of the Entity orientation were accounted for by the negative implications of holding performance goals and the absence of the positive benefits of holding learning goals. Previous research has also documented the advantages of learning goals relative to performance goals (Ames, 1992; Blumenfeld, 1992).

Second, the path analysis shows that goal orientation does not entirely mediate the effects of implicit theories in the academic domain: The link between implicit self-theories and attributions and behavioral response was independent of goal orientation. These non-mediated links may reflect Entity theorists’ perceived lack of control over their ability. Indeed, it makes sense that believing one’s ability is fixed and that one has little control over this fixed ability level would translate into achievement attributions reflecting this lack of control (ability for failure, luck for success) and to giving up easily in the face of challenge. Importantly, the performance goal of documenting one’s ability level does not need to be psychologically salient for these relations to occur.

Third, the path analyses help explain the process through which Entity orientation might contribute to long-term declines in self-esteem. Specifically, these analyses suggest that Entity theorists go into challenging achievement situations hoping to prove that they are smart rather than to gain a mastery of the subject matter. The present findings, along with previous experimental research, suggest that this goal orientation sets in motion a helpless response pattern that persists regardless of whether Entity theorists succeed or fail. According to Dweck, the feeling of being challenged convinces Entity theorists that they do not have what it takes to succeed; if they were smart enough, then the task would be easy. Thus, they attribute their failures to low ability—a confirmation that they are dumb—and their successes are easily explained away as due to luck. As a result, they feel badly, regardless of whether they succeed or fail, and give up more easily when challenged. The path model suggests that this process, occurring repeatedly throughout college, may chip away at the Entity theorist’s self-esteem over time. Moreover, it is the Entity theorists’ negative affect and behavioral tendency to give up that have the most direct and powerful effects on declining levels of self-esteem.

These findings are particularly informative in light of the claim that the helpless pattern of the Entity theorist is associated with contingent self-worth (Burns & Dweck, 1995; Dweck, 1999; Molden & Dweck, 2000). Specifically, these findings suggest that not only is failure the source of negative feelings about self for the Entity
theorist, but also that even the successes on which self-esteem is supposedly contingent may not promote self-esteem because they are viewed as due to external forces. In other words, if Entity theorists do not take credit for their successes, then they are unlikely to experience the boost in self-esteem that success presumably produces for individuals with contingent self-worth. Thus, rather than simply producing unstable self-esteem, contingent self-worth may contribute to a downward spiral in self-esteem levels. This may be especially true in a context such as college in which the threat of failure is ever-present, ready to tarnish the significance of any success.

Although the path analyses provide insights into the processes that might make Entity theorists vulnerable to decreasing self-esteem, one limitation of this research is that we cannot rule out the possibility that the causal direction is reversed; that is, self-esteem change might determine an individual’s implicit self-theory. Dweck and her colleagues have used experimental methods to document the causal effects of Entity orientation and performance goals on the helpless and mastery patterns (Bempechat et al., 1991; Elliott & Dweck, 1988; Hong et al., 1999), but the causal link between these patterns and self-esteem has yet to be established. However, it is less clear how the reverse causal process might proceed, that is, through what psychological process might self-esteem change lead to a particular implicit self-theory? One possibility is that low self-esteem contributes to a generalized lack of perceived control, which then translates into a belief that one’s intelligence cannot be improved. If this is the case, then antecedent self-esteem levels should predict subsequent change in implicit self-theories; in other words, individuals who enter college with low self-esteem should become progressively more Entity oriented during college. To test this possibility, we computed a growth curve trajectory for the Entity orientation scale across Years 2, 3, and 4, and then correlated this trajectory with self-esteem. Initial self-esteem levels did not predict change in implicit theories, and neither did self-esteem measured in any of the other five assessments (rs ranged from -0.07 to 0.07). Thus, although Entity orientation predicts change in self-esteem, self-esteem does not predict change in Entity orientation. This pattern is consistent with the idea that the Entity orientation causes low self-esteem and helps rule out alternative causal models, but longitudinal designs cannot establish causal effects and experimental studies are needed to fully address this issue (Rogosa, 1995).

A related issue concerns whether the correlates of Entity orientation are independent of individual differences in self-esteem. In other words, do Entity theorists tend to adopt performance goals and show a helpless response to challenge because they tend to have low self-esteem? To test this possibility, we computed partial correlations between Entity orientation and all of the dependent variables in the model, controlling for average levels of self-esteem. Entity orientation had an independent relation with every variable except affective responses to achievement. In other words, Entity theorists do not feel less determined and enthusiastic and more distressed and ashamed about their achievement, once their tendency to be somewhat lower in self-esteem is taken into account. The present data, however, do not allow us to determine whether the Entity orientation leads to negative feelings about achievement which lead to lower self-esteem, or whether the Entity orientation leads to lower self-esteem which leads to negative feelings about achievement. However, according to the proposed connection between the Entity orientation and contingent self-worth (Burhans & Dweck, 1995; Dweck, 1999; Molden & Dweck, 2000), it makes sense that the negative affective responses of Entity theorists would
Contribute to low self-esteem. Feeling bad about failure entails feeling bad about the self because self-worth is contingent on performance.

In addition to illuminating the connection between implicit theories and self-esteem, the present study furthers our general understanding of self-esteem change. Despite decades of research on self-esteem development (Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002), we know very little about why one individual increases in self-esteem while another decreases. The few studies that have been conducted on this issue do not provide any kind of process explanation for the causes of individual differences in self-esteem change (e.g., Block & Robins, 1993). Moreover, although experimental studies have linked a number of self-evaluative processes to short-term changes in self-evaluation (e.g., Brown & Mankowski, 1993; Gergen, 1981; Heatherton & Polivy, 1991; Kernis, 1993), these researchers have not tested whether such processes are related to self-esteem change over longer periods of time in real-world contexts.

In our view, hypotheses about long-term changes in self-esteem should be derived from experimental research on the self-evaluative mechanisms that drive the self system, that is, the processes presumed to play a role in how self-evaluations are formed, maintained, and changed (Robins, Norem, & Cheek, 1999). In the present research, we have shown how one such process—the implicit self-theory process—can impact self-esteem change over time in the academic domain. Thus, this study illustrates how experimental research on motivational and self-regulatory processes originally documented in the lab may inform research on long-term changes in self-esteem. More generally, this research points to the need for greater interplay between experimental research that identifies and isolates causal mechanisms and longitudinal research that helps map out long-term consequences in real-world settings.

Conclusion

In conclusion, the present findings demonstrate the pervasive effects of implicit beliefs in the academic context, and help us understand why some individuals approach achievement situations as challenges inspiring them toward mastery whereas others see them as insurmountable hurdles that will ultimately determine their self-worth. To an Entity theorist, the achievement context is a perilous place in which their fate—success or failure, smart or dumb—is determined by relatively uncontrollable forces.

Notes

1. Age did not correlate significantly with Entity orientation in either sample ($r = -.07$ in the sample using the 5-point scale and $-.01$ in the sample using the 7-point scale).

2. The reliabilities (composited over Years 2, 3, and 4) were .82 for the Entity scale, .89 for the academic self-confidence scale, .59 for the individual rating of perceived performance, .38 to .75 (median $=.59$) for the individual attribution ratings, .68 to .86 (median $=.77$) for the individual affect ratings, and .87 and .86 for the helpless and mastery-oriented behavior scales. The learning and performance goal scales were computed from items administered in different assessments, and therefore were already aggregated over time.

3. The one exception was the correlation with effort attributions, which were near zero for Years 3 and 4.
4. We computed this composite variable rather than incorporating the interaction between perceived performance and Entity orientation into the model because testing for continuous interaction effects in structural models is problematic (Joreskog & Yang, 1996). Regardless, when we did include the interaction term as an independent variable in the structural model, none of the path coefficients to be reported were significantly altered, except that the path from learning goals to helpless attributions was no longer statistically significant.

5. To control for the effects of self-esteem, we conducted an additional path analysis in which the growth curve intercept (representing an individual’s average self-esteem level) was added to the model. This had almost no effect on the path coefficients, suggesting that the variables in the implicit self-theory model influence self-esteem change independently of their effects on self-esteem level.

References


