

Causality Orientations, Failure, and Achievement

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ABSTRACT Two studies examined similarities between Deci and Ryan's (1985) causality orientations theory and Dweck and Leggett's (1988) social-cognitive theory of achievement. Study 1 examined the conceptual similarity between the individual difference measures central to the two theories. It was shown that autonomous college students are likely to adopt learning goals and report high confidence in their academic abilities; controlled students are likely to adopt performance goals and to report high levels of confidence in their ability; and impersonal students are likely to possess the classic helpless pattern of performance goals and low confidence in their academic abilities. Study 2 examined whether causality orientations, like Dweck's measures of goals and confidence, moderate the impact of failure feedback on motivation as measured in persistence and performance. The results suggested that autonomous individuals respond to failure in a mastery-oriented fashion, whereas impersonal individuals respond in a helpless manner. The response of controlled individuals to failure parallels that of people described as ego-involved or reactive.

We would like to thank Marc Blais and Robert Vallerand for their comments on an earlier version of this manuscript. We would also like to thank Edward Deci, Richard Ryan, James Connell, and the other members of the Rochester Motivation Group for their help in developing some of the ideas for this article. This research was funded by grants from the Social Sciences and Humanities Research Council of Canada and the Fonds pour la formation de chercheurs et l'aide à la recherche (Quebec) to Richard Koestner. Correspondence concerning this manuscript should be addressed to Richard Koestner, Department of Psychology, McGill University, 1205 Dr. Penfield Avenue, Montreal, Quebec, Canada H3A 1B1.

Journal of Personality 62:3, September 1994. Copyright © 1994 by Duke University Press. CCC 0022-3506/94/\$1.50

Causality Orientations: Theory and Measures

Causality orientations theory (Deci & Ryan, 1985) distinguishes among three broad classes of behavior and motivationally relevant psychological processes: autonomous, control-determined, and impersonal. Autonomous behaviors are initiated and regulated by choices that are based on an awareness of one's needs and integrated goals. People who function autonomously are hypothesized to seek out choice and to experience their behavior as self-initiated. Control-determined behaviors are initiated and regulated by controls in the environment such as reward structures or by internally controlling imperatives indicating how one "should" or "must" behave. People who are oriented toward control are expected to seek out controls and to interpret their environment as controlling. Impersonal behaviors are those whose initiation and regulation are perceived to be beyond a person's intentional control. People with an impersonal orientation are likely to believe that they cannot control their behavior and consequently cannot obtain desired outcomes; their behavior can generally be described as amotivational or helpless.

The General Causality Orientations Scale (GCOS; Deci & Ryan, 1985) was developed to measure individual differences in people's orientation toward autonomous, control-determined, and impersonal functioning. This self-report questionnaire was "constructed to be a general scale, one that cuts across domains and includes a wide range of responses and reactions" (Deci & Ryan, 1985, p. 130). The GCOS yields subscale scores for each of the three orientations. The autonomy and impersonal subscales are negatively related ($r = -.25$); the control and impersonal subscales are positively related ($r = .27$); and the autonomy and control subscales are unrelated to each other ($r = .03$) (Deci & Ryan, 1985). Gender appears to be modestly related to the autonomy and control orientations, with women scoring higher on autonomy and men scoring higher on control (Blustein, 1988; Deci & Ryan, 1985; Vallerand, Blais, LaCouture, & Deci, 1987). All three subscales have demonstrated good internal and test-retest reliability—Cronbach alphas range from .75 to .90; test-retest r s range from .75 to .85 (Blustein, 1988; Deci & Ryan, 1985; Vallerand et al., 1987).

Correlates of causality orientations. Research with the GCOS has focused on examining the relation between the three causality orientations

and theoretically relevant self-report personality measures. In the following section, the correlates of the autonomy, control, and impersonal subscales are summarized in terms of self-processes and achievement processes.

The autonomy orientation has consistently been associated with positive self-evaluations. High autonomy individuals possess high self-esteem, rarely derogate themselves, and experience low levels of guilt (Deci & Ryan, 1985). The autonomy orientation is also associated with greater self-awareness, as reflected in significant positive correlations with scales measuring self-actualization, ego development, and private self-consciousness (Deci & Ryan, 1985; Scherhorn & Grunert, 1988; Vallerand et al., 1987). The autonomy orientation is related to a confident and effective approach toward achievement: It is predictive of an internal locus of control, a tendency to attribute successes to ability or effort, and the absence of feelings of boredom (Farmer & Sundberg, 1986; Koestner, 1986). In sum, the autonomy orientation appears to be related to healthy and adaptive functioning.

There is no evidence that the control orientation is related to either positive or negative self-evaluations. With regard to achievement, the control orientation appears to be related to the adoption of a pressured, extrinsic orientation toward activities. It is associated with reporting that it is very important to do well in achievement situations, a time-conscious approach to one's activities, and a tendency to experience hostile feelings (Deci & Ryan, 1985). It has been noted that when controlled individuals persist vigorously at an activity in the absence of external controls this persistence does not appear to reflect intrinsic motivation insofar as it is not related to self-reports of interest and enjoyment; rather, it appears to reflect a form of internally controlling self-regulation (Koestner, Bernieri, & Zuckerman, 1992).

The impersonal orientation has been shown to be significantly related to negative self-evaluations, as reflected in self-derogation and low self-esteem (Deci & Ryan, 1985; Vallerand et al., 1987). The impersonal orientation has also been associated with depression (Deci & Ryan, 1985) and with eating disorders of both a restrictive and incorporative nature (Scherhorn & Grunert, 1988; Strauss & Ryan, 1987). In achievement settings the impersonal orientation is predictive of helpless feelings, thoughts, and behaviors. Impersonals have an external locus of control, tend to attribute their successes to external factors, and frequently experience feelings of boredom (Deci & Ryan, 1985; Farmer

& Sundberg, 1986; Koestner, 1986; Scherhorn & Grunert, 1988; Valerand et al., 1987). In sum, the impersonal orientation appears to be predictive of motivational deficits and disturbances of the self-system.

Current status of the General Causality Orientations Scale. The GCOS has been cited in only six published articles since it first appeared in 1985. We would suggest that it has been underused because of (a) confusion about what is meant by an orientation toward causality and (b) a lack of clarity about how the scale can be used operationally.

Most important, it appears that causality orientations theory suffers from the fact that many people confuse "locus of causality" with "locus of control." Deci and Ryan (1991) have recently attempted to clearly delineate the two constructs by noting that they have very different referents:

Locus of *control*'s being internal versus external refers to whether a person believes that outcomes can (versus cannot) be reliably attained: in other words, it refers to contingency expectations, with efficacy expectations implicit within them. Thus locus of control allows one to predict whether a person is likely to engage in motivated (intentional) action. In contrast, the locus of *causality* being internal versus external refers to whether the experienced locus of initiation for a motivated (intentional) action is internal versus external to one's *self*. As such internal versus external *control* is somewhat parallel to the Heiderian distinction between personal and impersonal *causality*, whereas internal versus external *causality* can be best understood as referring to gradations or subcategories within personal causation and thus to variations in the degree to which intentional action is self-determined. (p. 249)

It should be noted that causality orientations theory suggests that *both* the autonomy and control orientation should be positively related to belief in an internal locus of control, whereas the impersonal orientation should be associated with belief in an external locus of control (Deci & Ryan, 1985).

In addition to clearly delineating the conceptual differences between the control and causality constructs, we would recommend referring to "control-oriented" individuals as "controlled" so that people are not so likely to confuse the term with possessing an external locus of control or with subjects who are in a "control" (i.e., nonexperimental) group.

A second problem with the GCOS is practical rather than conceptual.

The GCOS is an unusual personality scale in that it yields three separate subscale scores that are only weakly related to one another statistically, but are tied to constructs that have fairly strong implied relations. For example, the autonomy and control scales are only somewhat negatively correlated, yet the theoretical description of an autonomy versus control orientation would lead one to assume a fairly strong negative relation between them. When one attempts to use the three subscales in a dimensional manner that implies contrasts between low and high scorers on a particular scale, difficult theoretical questions arise. For example, it is hard to detail how someone with a low autonomy score may differ from someone with a high controlled score or a high impersonal score. Causality orientations theory is better suited to specifying typological distinctions among people with different causality orientations. That is, it is easier to predict how people who are predominantly autonomous in their orientation would differ from those who are predominantly controlled or impersonal.

We therefore propose that causality orientations theory is most likely to be advanced by using the GCOS in a typological rather than dimensional manner. This type of categorization can be accomplished by standardizing subjects' scores on the three scales and then sorting them into the following three groups:

1. *Autonomous* = z Autonomous $>$ z Controlled and z Autonomous $>$ z Impersonal.
2. *Controlled* = z Controlled $>$ z Autonomous and z Controlled $>$ z Impersonal.
3. *Impersonal* = z Impersonal $>$ z Autonomous and z Impersonal $>$ z Controlled.

It should be noted that Deci and Ryan (1985) were careful to note that each individual likely functions some of the time in an autonomous manner, sometimes in a controlled manner, and sometimes in an impersonal manner. Nonetheless, we would argue that causality orientations theory is most likely to be advanced if the orientations are treated in categorical terms. The usefulness of a categorical approach was confirmed in a recent study by Koestner et al. (1992).

Dweck and Leggett's (1988) Social-Cognitive Theory of Achievement

Dweck (1991) has noted that perhaps the most fascinating motivational question in the area of achievement is why people of equal ability

so often show dramatically different responses when faced with obstacles. She and her colleagues (1986, 1991; Dweck & Leggett, 1988; Elliot & Dweck, 1988) have recently offered a comprehensive motivational framework to explain why some individuals shy away from challenges and wither in the face of failure, whereas others accept challenge and persevere despite negative feedback. Dweck's work began with the identification of two personality types in children who were in a problem-solving situation (Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973). Children who behaved identically when told that they were successful diverged into two groups with the onset of failure. When presented with negative feedback, "helpless" children interpreted it as a sign of low ability, consequently viewed the problem as insurmountable, and stopped trying. "Mastery-oriented" children made attributions to effort rather than ability, used failure feedback as a cue to change their problem-solving strategies, and engaged in self-monitoring and self-instruction. As a result, the performance of mastery-oriented children remained the same or improved somewhat, whereas that of the helpless-oriented children declined.

Elliot and Dweck (1988) have shown that the mastery versus helpless pattern of behavior can be predicted by achievement goals. People who have learning goals of increasing their ability and mastering new tasks will also be mastery-oriented and maintain these goals in spite of failure. People who have performance goals strive to present their abilities in as positive a light as possible. If they perceive their ability to be high, they will show the mastery-oriented behavior patterns. However, for those who perceive their ability as low, negative feedback is an indication that they will never display themselves positively. People with performance goals and low confidence in their ability are expected to display the helpless behavior pattern. In fact, when Elliot and Dweck (1988) experimentally fostered learning or performance goals and manipulated confidence in ability by means of performance feedback, they were able to create the mastery-oriented and helpless behavior patterns in their entirety.

Self-report measures have been developed to assess individual differences of confidence in intelligence and goal orientation (Dweck & Henderson, 1988). In the first study, we employ Dweck and Henderson's measure of confidence in intelligence along with a measure developed by Eison (1981) to assess learning versus performance goals toward education. This latter scale was considered preferable to Dweck

and Henderson's measure (1988) because it included more items, had excellent internal and test-retest reliability, and was appropriate for use with college students.

Similarities between Causality Orientations Theory and Social-Cognitive Theory of Achievement

The preceding sections outlined how two motivational frameworks account for individual differences in achievement behavior. In the following section, the similarities between Deci and Ryan's (1985) causality orientations theory and Dweck and Leggett's (1988) social-cognitive theory of achievement are highlighted.

Both frameworks identify a subset of individuals who are likely to display a poor motivational response to situations that pose challenge and the risk of failure. Deci and Ryan describe a person with a strong impersonal orientation as someone who has "the tendency to experience him or herself as being incompetent to obtain desired outcomes" (1985, p. 112). Research has shown that the impersonal orientation is associated with very negative self-evaluations and a tendency to make self-defeating performance attributions (Koestner, 1986). Similarly, Dweck and Leggett (1988) identify children who are likely to respond maladaptively to obstacles and failure. Specifically, individuals who possess a combination of performance goals and low confidence in their ability are expected to behave in a helpless manner when faced with obstacles and difficulties; like high impersonals, they are likely to make self-defeating performance attributions, evaluate themselves negatively, and demonstrate performance deterioration. We propose that an individual with the unique combination of performance goals and low confidence is, in fact, a special case of what Deci and Ryan (1985) have described as a person with a strong impersonal orientation.

The two frameworks also appear to converge in identifying subtypes of individuals who regulate their achievement behavior according to cues that are extrinsic versus intrinsic to an activity. Deci and Ryan (1987, 1991) suggest that autonomous individuals are likely to regulate their behavior on the basis of intrinsic motivation or according to more self-determined forms of internalized self-regulation. By contrast, controlled individuals seek out controls in their environment and generally regulate their behavior on the basis of extrinsic or introjected controls.

Research has indicated that the control orientation is associated with the adoption of a pressured, ego-involved stance toward achievement tasks (Deci & Ryan, 1985).

Dweck and Leggett (1988) describe individuals who focus upon learning goals in an achievement setting as interested in mastering the task and improving their abilities, whereas those with performance goals are interested in proving that they are competent and view success at an activity as a means to this end. As noted by Dweck (1986), it is possible to describe learning-oriented individuals as intrinsically motivated, whereas performance-oriented individuals could be described as extrinsically motivated. We propose that individuals with learning goals resemble Deci and Ryan's (1985) description of people who regulate their behavior in an autonomous fashion, whereas individuals with performance goals resemble the description of people who regulate their behavior in a controlled manner.

It should be noted that both autonomous and controlled individuals have confidence in behavior/outcome contingencies and are therefore likely to possess high confidence in their ability, as measured by Dweck.

Study 1

Study 1 was designed to examine the conceptual similarity between the motivational constructs developed by Deci and Ryan (1985, 1987, 1991) and Dweck and Leggett (1988). The GCOS, along with measures assessing confidence in intelligence (Dweck & Henderson, 1988) and academic goal orientation (Eison, 1981), was administered to 60 college students. The following predictions were offered:

1. The autonomy orientation will be associated with a learning goal orientation and high confidence in intelligence;
2. The controlled orientation will be associated with a performance goal orientation and high confidence in intelligence; and
3. The impersonal orientation will be associated with a performance goal orientation and low confidence in intelligence—i.e., the classic helpless pattern of motivational components.

METHOD

Subjects

Forty-three women and 17 men at a large northeastern university participated in the experiment as partial fulfillment of a course requirement.

Procedure

Questionnaires were group-administered in a large introductory motivation class. The GCOS was administered first, the goal questionnaire second, and the confidence measure third. The scales were administered at different times to reduce the tendency to develop a particular response set that might artificially inflate relations among scales.

The General Causality Orientations Scale. The GCOS consists of 12 brief vignettes, each presenting a situation (such as having just been turned down for a job) followed by three possible responses to that situation: one that is autonomy-oriented, one that is control-oriented, and one that is impersonal-oriented. Eight of the 12 vignettes could be construed as achievement-related. Each response is followed by a 7-point scale on which the respondent rates the extent to which that response—whether a behavior, thought, or feeling—would be characteristic of him or her in that situation. For example, subjects are given the scenario:

Recently a position opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. In evaluating the situation you are likely to think:

An autonomy orientation is measured by the response, “You would probably take a look at factors in your own performance that led to your being passed over.” A control orientation is measured by the response, “The other person probably ‘did the right things’ politically to get the job.” An impersonal orientation is measured by the response, “You really didn’t expect the job; you frequently get passed over.” Subscale scores are created by averaging respondents’ 12 ratings for that subscale. Higher scores on each subscale indicate that the person has more of that particular orientation.

Confidence in intelligence. The confidence measure was developed by Dweck and Henderson (1988). Subjects are presented with four pairs of statements and asked to choose which is most true of them, and to indicate on a 3-point scale how true it is for them. For example, one pair of statements reads “I’m not sure I’m smart enough to be successful” and “I’m pretty sure I’m smart enough to be successful.” Scores can range from 0 to 12.

Goal orientation. To determine whether subjects had learning or performance goals, we administered Eison’s (1981) Learning-Oriented/Grade-Oriented (LOGO) scale, which assesses whether a student is oriented toward learning class material (learning goal) or toward receiving high grades (performance goal). Subjects indicated on a 7-point scale the extent to which they agreed with 23 statements such as “It would not disturb me very much to earn a grade lower than I would have wanted if I feel I learned something from the class”

or "I think it is my fear of getting a poor grade that motivates me to study." All answers are scored toward learning-goal orientation; thus higher scores reflect more of a learning-goal rather than a performance-goal orientation. The scale possesses adequate internal consistency and test-retest reliability (Eison, 1981).

RESULTS

Preliminary analyses showed that the GCOS subscales and the confidence and goal measures were unrelated to gender. For the main analysis, GCOS scores were standardized and subjects were classified into three groups: autonomous, controlled, and impersonal. Median splits were performed on the confidence and goal measures, creating the four groups central to Dweck and Leggett's classification system: low confidence/performance goal, low confidence/learning goal, high confidence/performance goal, and high confidence/learning goal. A 3×4 (Causality Orientation \times Combination of Confidence in Intelligence and Goal Orientation) two-way chi-square analysis was conducted to examine the relation between the constructs central to Deci and Ryan's (1985) and Dweck and Leggett's (1988) theories.

A highly significant chi square indicated a significant degree of covariation between the three causality orientations and the four confidence/goal combinations, Pearson chi square = 17.3, $p < .01$. Table 1 presents the percentage of subjects with each combination of confidence and goals who had an autonomous, controlled, or impersonal causality orientation. It can be seen that autonomous subjects accounted for 58% of the subjects classified as high-confidence/learning-goal oriented; controlled subjects accounted for 50% of the subjects classified as high-confidence/performance-goal oriented; and impersonal subjects accounted for 58% of those classified as low-confidence/performance-goal oriented.

The results point toward the conceptual similarity of the motivational typologies developed by Deci and Ryan (1985) and Dweck and Leggett (1988). An autonomy orientation is associated with high confidence in one's abilities and the adoption of learning goals; a controlled orientation is associated with high confidence in ability and a performance goal orientation; and an impersonal orientation is associated with low confidence in ability and a performance goal orientation.

Table 1
Confidence in Intelligence and Goal Orientation Combinations by Causality Orientation

Confidence/goal combination	Causality orientation			Total
	Autonomy	Controlled	Impersonal	
High confidence/learning goal	11	5	3	19
Row percentage	58%	26%	16%	
High confidence/performance goal	3	6	3	12
Row percentage	25%	50%	25%	
Low confidence/learning goal	4	1	5	10
Row percentage	40%	10%	50%	
Low confidence/performance goal	1	7	11	19
Row percentage	5%	37%	58%	
Column Total	19	19	22	

Study 2

The strength of Dweck's social-cognitive theory of achievement is that it provides a way to understand why people of equal ability respond to failure in either a helpless or mastery-oriented manner. Study 2 was designed to examine whether causality orientations predict the types of behavior patterns outlined by Dweck and Leggett (1988) as reflective of maladaptive (helpless) versus adaptive (mastery-oriented) patterns of achievement behavior in the face of performance difficulties. Specifically, the persistence and subsequent performance of subjects identified as autonomous, controlled, or impersonal were examined under conditions of failure versus success at an achievement task.

The results of Study 1 indicated that impersonal subjects were likely to endorse performance goals and proclaim low confidence in their intelligence. It can therefore be expected that impersonals would be likely to display the same motivational deficits that Dweck and Leggett (1988) have associated with helpless-oriented individuals. That is, when faced with the challenge of failure, impersonals are likely to view their difficulties as insurmountable and believe that further effort is futile. Impersonals are thus expected to fail to maintain effective striving under

failure conditions. Specifically, both their persistence and performance are expected to be significantly lower after failure than after success. It should be noted that performance deterioration and lowered motivation that are induced by means of failure feedback are typically viewed as reflecting "a learned helplessness effect" (Boggiano & Barrett, 1985).

Because they pursue learning goals and have high confidence in their ability, autonomous individuals can be expected to respond to challenges and obstacles more adaptively. Like the mastery-oriented individuals described by Dweck and Leggett (1988, p. 258), autonomous individuals can be expected to view unsolved problems not as "failures that reflect on their ability" but rather as "challenges to be mastered through effort." The end result should be that autonomous individuals persevere despite receiving failure feedback, showing continued persistence and steady performance. That is, autonomous individuals should display roughly the same level of motivation after failure as after success.

Two different theoretical perspectives related to the motivational phenomena of ego involvement and reactance offer reasons to expect that controlled individuals will display heightened effort after failure relative to success. It has been noted that controlled individuals not only rely on explicit extrinsic controls such as reward structures to guide their behavior but also upon introjected regulations concerning how they should behave (Deci & Ryan, 1987; Ryan, 1993). The latter form of regulation leads to a state of ego involvement, a condition where people's self-esteem is hinged on performance, leading people to pressure themselves in the same way external forces do (Koestner, Zuckerman, & Koestner, 1987; Plant & Ryan, 1985; Ryan, 1982). This internally controlling state can be evidenced either as a function of individual differences or situational prompts and has already been linked with an orientation toward control (Deci & Ryan, 1985; Ryan, Koestner, & Deci, 1991).

It was recently shown that ego-involved individuals display greater persistence at an achievement activity after receiving nonconfirming performance feedback than after receiving success feedback. Ryan et al. (1991) explain this paradoxical behavior by noting that ego-involved people engage in an activity primarily to prove their competence (and thus their self-worth); positive performance feedback confirms their competence and thus provides the sought-after outcome. So, after success, ego-involved subjects are left with no motivation to pursue the task further. However, when ego-involved subjects receive nonconfirming performance feedback they are likely to "persist at the activity in

an attempt to observe improvement in their performance and thus get a kind of self-administered positive feedback that could help preserve self-esteem" (Ryan et al., 1991, p. 188). This explanation suggests that if controlled subjects perceive the "failure" feedback (e.g., "You performed at the 39th percentile") to be nonconfirming, they too will show greater motivation after failure than success.

Another theoretical approach that may provide insight into the achievement behavior of controlled individuals following failure was offered by Wortmann and Brehm (1975). In their integration of theories of reactance and learned helplessness, these authors suggested that renewed effort in the face of failure can be expected when individuals (a) expected to be able to control the outcome of their performance, (b) viewed their performance at the activity as important, and (c) did not experience extended bouts of uncontrollable failure. Study 1 indicated that controlled individuals are high in their confidence in their ability, suggesting that they are likely to feel they can control performance outcomes. Furthermore, Deci and Ryan (1985) reported that controlled individuals are likely to view achievement tasks as important. Because the failure manipulation in the present study is likely to be interpreted as mild compared to the repeated bouts of failure used in classic helplessness experiments, it might be suggested that for controlled individuals, all three of Wortmann and Brehm's (1975) conditions for reactance are likely to be present.

Although both autonomous and controlled individuals are expected to be undaunted by failure, it should be noted that the persistence of controlled individuals after failure is expected to be identifiably different from that of autonomous individuals when a phenomenological level of analysis is applied (Deci & Ryan, 1991; Ryan, 1993). Rather than reflecting renewed interest and flexible adoption of different strategies, it is expected that controlled individuals will persist in a pressured, reactive, ego-involved manner devoid of feelings of interest, enjoyment, and self-determination. Three recent studies suggest that this form of "internally controlled" persistence can be distinguished from intrinsic motivation by examining the relations between behavior and self-reported affect (Deci, Eghrari, Patrick, & Leone, 1994; Koestner et al., 1992; Ryan et al., 1991). To the extent that behavior and affect are incongruent—e.g., one persists but claims one is not interested in the activity or one fails to persist yet reports high interest—it can be assumed that the behavior reflects internal control rather than intrinsic motivation.

Study 2 also included a situational manipulation of learning versus performance goals in order to consider the possibility that causality orientations combine with goals to influence responses to failure. The dependent measures were free-choice persistence, performance at a subsequent task, and affective self-reports of interest, competence, and self-determination. The affective self-reports were to be used to differentiate whether persistence represented intrinsic motivation or internal control. Our predictions were as follows:

1. Causality orientations will influence people's response to failure versus success insofar as autonomous and controlled individuals will respond to failure more adaptively (i.e., with greater persistence and better subsequent performance) than impersonals.

2. The persistence of autonomous individuals will be more closely associated to self-reports of positive affect (i.e., interest, enjoyment, competence, and self-determination) than the persistence of controlled individuals.

It remained to be seen whether goals would combine with causality orientations to influence task motivation.

METHOD

Subjects

Subjects were 166 introductory psychology students (69 males, 97 females) who participated in partial fulfillment of course requirements. Approximately equal numbers of each sex were randomly assigned to the conditions of the 2×2 (Outcome [Success/Failure] \times Goal [Learning/Performance]) factorial design. All subjects participated in the experiment individually.

Procedure

Assessment of causality orientations. On reporting to the experiment, subjects were asked to complete the GCOS (see Study 1 for a description of this scale).

Baseline measures. After completion of the GCOS, subjects were presented with a sample and a practice word-maze puzzle, followed by a pre-experiment questionnaire. The puzzles required subjects to find a continuous path of letters that would make a meaningful word. Pilot testing had shown that these puzzles possessed a high level of intrinsic interest for college students. The first experimenter (one of two females) instructed the subject to look over the sample puzzle and then to work on the practice puzzle for 90 seconds. Performance

on the practice puzzle was to be used as a baseline performance measure. Following their practice puzzle solving, subjects completed a questionnaire containing six 7-point Likert scales. Two scales (“I did not feel nervous” and “I did not feel pressured”) served as a baseline measure of *self-determination*; two others (“I found the puzzles interesting” and “I found the puzzles to be fun”) served as baseline measures of *interest-enjoyment*; and two scales (“I did very well” and “I felt skillful”) assessed subjects’ *perceived competence*. The zero-order correlations between the pair of items in each scale were as follows: self-determination, $r(164) = .48$; interest-enjoyment, $r(164) = .65$; and perceived competence, $r(164) = .58$. After completion of the pre-experiment questionnaire, the puzzles were removed and subjects were told that they would be working on similar word-maze puzzles for the next several minutes.

The self-reports of interest, self-determination, and competence were moderately positively correlated, mean $r(164) = .46$. Because of potential redundancy among these measures we decided to form a summary measure of positive affect consisting of the six items tapping interest, competence, and self-determination. This summary measure had a fairly good internal reliability, $\alpha = .82$.

Goal and outcome manipulations. Before working on the puzzles in the performance period, subjects in the *performance goal* condition were told that they would be provided with information regarding the percentage of people who did better or worse than they did. Subjects in the *learning goal* condition were told that they would be provided with information regarding the percentage of the task they had completed successfully. Dweck and Leggett (1988) specifically note that different goal structures can be induced by “orienting subjects either toward evaluation of their ability relative to a peer or toward improvement of their ability over time” (p. 260). After subjects completed 10 puzzles the experimenter stated that she would look them over and tell them how well they had performed. Performance goal subjects assigned to the *success* condition were told that they were in the 92nd percentile compared to other students, while learning goal subjects assigned to the success condition were informed that they had successfully completed 92% of the puzzles. Performance goal subjects assigned to the *failure* condition were told that they were in the 39th percentile compared to other students, while learning goal subjects assigned to the failure condition were informed that they had successfully completed only 39% of the puzzles. The experimenters were blind to the hypotheses and did not know subjects’ scores on the causality orientation scales.

Persistence. After delivering the feedback, the experimenter explained that she needed a couple of minutes to obtain some questionnaires. Three unused word-maze puzzles were left in the room with the subject. Two recent popular magazines were also available. Subjects were left alone for 60 seconds during

which time they were unobtrusively observed through a one-way mirror by the second experimenter, who was blind to the feedback conditions. The number of seconds spent by the subject working on the puzzles during this free-choice period provided the behavioral measure of persistence. Scores were converted to t scores ($M = 50$ and $SD = 10$) so that they would be on the same metric as the performance on the path maze puzzles.

It should be noted that the free-choice measure described above as persistence has commonly been conceptualized as a behavioral index of intrinsic motivation. However, it has recently become clear that nonintrinsic forms of motivation can impel an individual to continue on a task. Most important, an internally controlling form of self-regulation often seems to lead to high levels of task-engagement during free choice. The difficulty of sorting out intrinsically motivated persistence from internally controlled persistence is discussed by Deci and Ryan (1991), Deci et al. (1994), Koestner et al. (1992), and Ryan et al. (1991).

Self-report measures. The experimenter returned and administered the post-experiment questionnaire, which was identical to the pre-experiment questionnaire: Two items tapped self-determination, $r(164) = .54$, two items tapped interest-enjoyment, $r(164) = .78$, and two assessed perceived competence, $r(164) = .94$. A summary measure of positive affect was again created by calculating the mean of the six items related to interest, enjoyment, competence, and self-determination ($\alpha = .84$).

Performance at a second maze task. Subjects were next introduced to a path maze task. Subjects worked on five mazes with a 2-minute time limit for each one. They were instructed to find their way out of the maze as quickly as possible. An average performance score was calculated by computing the mean time it took each subject to complete a puzzle. For mazes that subjects were unable to complete in the allotted time, we calculated the percentage of the entire route that was completed and extrapolated the time that subjects would have taken to complete the maze if given more time. Thus, lower scores reflect better performance. No performance feedback was given while subjects worked on the puzzles. Scores were converted to t scores and reversed ($100 - t$), so that high scores would reflect better performance and could be easily compared with persistence scores.

Manipulation checks. After completing the path maze task, subjects were asked to indicate the kind of information the experimenter had told them they would receive as feedback on the first task. Specifically, they were instructed to choose one of two answers to the question "What type of information did you expect to get?"—(a) "What percentage of people did better or worse than me?" or (b) "What percentage of the task did I complete successfully?" Finally, subjects were asked to comment on the experiment and were then debriefed.

RESULTS

Baseline affective self-reports and performance levels. In order to ensure that randomization of subjects to conditions was successful, baseline affective ratings and performance on the practice path maze puzzle were examined in 2×2 analyses of variance (ANOVAs) with outcome and goals as the between-subject factors. Both analyses failed to reveal any effects approaching significance ($ps > .10$), indicating that the groups did not differ at baseline.

Manipulation checks. Eighty of 83 subjects in the learning goal condition correctly identified the instructions they had received, whereas 82 of 83 subjects in the performance goal condition did the same.

The effectiveness of the outcome manipulation is reflected in the highly significant point-biserial correlation between outcome and change in feelings of competence (postexperiment questionnaire minus pre-experiment questionnaire), $r(164) = .66, p < .0001$. Subjects who received failure feedback showed a very large decrease in feelings of competence compared to those who received success feedback.

Relations among causality orientations, baseline measures, and sex. Pearson correlation analyses were performed to examine the relations among the causality orientations and the pretest measures of interest, competence, and self-determination. In these analyses subjects' scores on each of the three GCOS subscales were used rather than the categorical classification. The impersonal and control scales were somewhat positively related, $r(164) = .14, p < .10$, but both were unrelated to autonomy, $rs(164) = -.08$ and $.08$, respectively. For the three causality orientations there was only one significant correlation with a baseline measure: The impersonal orientation was negatively related to feelings of self-determination, $r(164) = -.16, p < .05$. Sex was not related to any baseline measure.

To examine sex differences on the causality orientations and baseline measures, t tests were performed. The only significant difference to emerge was for autonomy, $t(164) = 2.03, p < .05$; men scored higher than women ($M_s = 68.3$ and 66.2 , respectively).

Correlations among dependent variables. Pearson correlations were calculated among the three dependent variables. Free-choice persistence and performance at the path mazes were significantly related, $r(164)$

= .18, $p < .05$. However, both of these behavioral measures were unrelated to the summary self-report affect index. (Recall that the summary index was the change in self-determination, competence, and interest from before to after the experiment.) Note that the failure to find a significant positive correlation between the free-choice time and reports of interest-enjoyment and self-determination would suggest that the free-choice index was generally *not* measuring intrinsically motivated persistence (Deci & Ryan, 1991; Koestner et al., 1992; Ryan et al., 1991).

Analytic strategy for testing the major predictions. After standardizing GCOS scores, subjects were classified as autonomous, controlled, or impersonal in their causality orientation, following the procedure described in Study 1. Persistence and performance scores were examined in a $2 \times 2 \times 2 \times 3 \times 2$ repeated measures ANOVA with sex, outcome (success/failure), goal (learning/performance), and causality orientation (autonomous, controlled, impersonal) as between-subject factors and type of motivation (persistence/subsequent performance) as a within-subject factor. Persistence and subsequent performance were included as a single within-subject factor because the two measures were significantly positively correlated and are also conceptually related (Boggiano & Barrett, 1985).

Task motivation: Persistence and performance. The repeated measures ANOVA of the persistence and performance scores revealed a significant main effect for sex, $F(1, 142) = 6.64, p < .05$, indicating that females showed higher motivation than males for the activities ($M_s = 48.3$ for males; 50.8 for females). This main effect was qualified, however, by a significant Sex \times Goal interaction effect, $F(1, 142) = 5.06, p < .05$. *T* test comparisons between men and women performed separately for the two goal conditions showed a significant difference (favoring women) only for learning goals, $t(81) = -2.68, p < .01$, two-tailed. Figure 1 presents the mean task motivation scores for men and women with learning versus performance goals.

The repeated measures ANOVA also revealed the predicted Outcome \times Causality Orientation interaction effect, $F(2, 142) = 3.55, p < .05$. No other effects approached significance. Figure 2 presents the means after failure and success for the three causality orientations. It can be seen that autonomous individuals displayed about the same level of motivation after failure as success; controlled individuals showed higher

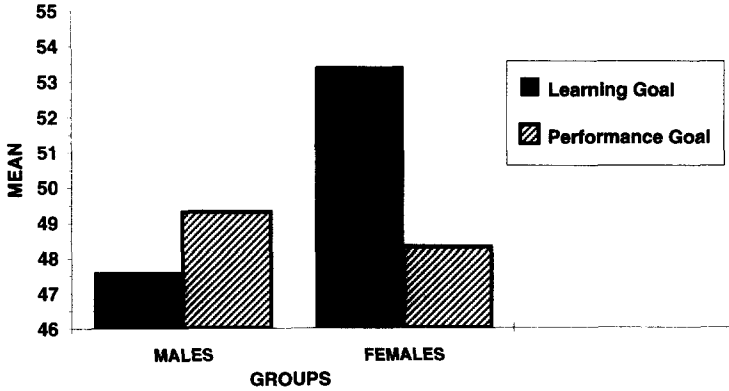


Figure 1
Mean Task Motivation by Sex and Type of Goals

Note. Mean task motivation represents the average *t* score of persistence and performance.

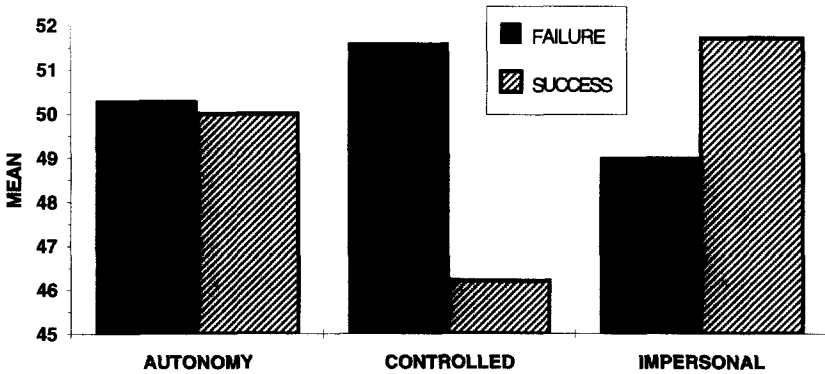


Figure 2
Mean Task Motivation after Failure and Success by the Three Causality Orientations

Note. Mean task motivation represents the average *t* score of persistence and performance.

motivation after failure relative to success; and impersonals showed less motivation after failure relative to success. *T* test comparisons showed that the motivation of autonomous subjects did not differ after success versus failure, $t(56) = .05, ns$; controlled subjects showed significantly greater motivation after failure than success, $t(50) = -2.97, p < .01$,

Table 2
Change in Self-Report Affect by Causality Orientation and Outcome

Causality orientation	Failure			Success		
	Pre-performance	Post-performance	Change	Pre-performance	Post-performance	Change
Autonomy (<i>n</i> = 58)	4.61	2.96	-1.65	4.86	5.02	0.16
Controlled (<i>n</i> = 52)	4.33	3.19	-1.14	4.83	4.89	0.06
Impersonal (<i>n</i> = 56)	3.87	2.72	-1.15	4.45	4.55	0.10

Note. Affect scores are the mean of the items assessing interest, competence, and self-determination.

one-tailed; and impersonal subjects showed somewhat less motivation after failure than success, $t(54) = 1.53, p < .07$, one-tailed.

Change in self-reported affect. Self-reports of affect were examined in a $2 \times 2 \times 2 \times 3 \times 2$ repeated measures ANOVA with sex, outcome (success/failure), goal (learning/performance), and causality orientation (autonomous, controlled, impersonal) as between-subject factors and time (pre-/postperformance) as a within-subject factor. A significant main effect emerged for causality orientation, $F(2, 142) = 7.40, p < .01$. This effect reflected the fact that autonomous and controlled subjects reported more positive affect than impersonal subjects ($M_s = 4.36$ and 4.31 for autonomous and controlled subjects, respectively, vs. 3.89 for impersonals). A highly significant Outcome \times Time interaction effect was also observed, $F(1, 142) = 78.29, p < .0001$, indicating that subjects in the failure condition showed a large decrease in positive affect over time relative to subjects in the success condition. No other main effects or interactions approached significance ($p_s > .10$). Table 2 presents the pre- and postperformance affect scores for the three causality orientations under conditions of success and failure.

The relation of persistence to affect as a function of causality orientation. It was expected that the persistence of autonomous subjects after failure would be different from that of controlled individuals in terms

of how it related to affective reports of self-determination, interest-enjoyment, and perceived competence. To examine this hypothesis we conducted a subgroup correlational analysis comparing the correlation between free-choice persistence and change in self-report affect scores for autonomous and controlled subjects in the failure condition.¹

The subgroup correlation analysis revealed that, as predicted, only for autonomous subjects was there a tendency toward a positive relation between length of free-choice persistence and positive change in affect, $r(26) = .20, ns$. For controlled subjects there was a significant negative relation between persistence and change in affect, $r(27) = -.34, p < .05$. The difference between these correlations was statistically significant, $z = 2.00, p < .05$. This pattern suggests that autonomous subjects reported affect that tended to match their behavior—increased positive feelings associated with greater persistence, decreased positive feelings associated with less persistence—whereas controlled subjects showed marked discrepancies between affect and behavior.²

DISCUSSION

The results point to the similarity of Deci and Ryan's (1985) causality orientations theory and Dweck and Leggett's (1988) social-cognitive theory of achievement. People's causality orientations function in much the same way as the measures used by Dweck to distinguish mastery-oriented versus helpless-oriented patterns of achievement behavior. People with an impersonal orientation responded to failure feedback in the same way as those described by Dweck and colleagues as helpless; they showed less persistence and subsequently performed at a

1. Note that in the learning goal condition the correlation between free-choice persistence and self-reports of interest-enjoyment for all subjects was significant, $r(81) = .22, p < .05$, whereas the same correlation approached zero in the performance goal condition, $r(81) = .03, ns$. This pattern of results supports the conclusion offered by Ryan et al. (1991) that conditions which foster task involvement will generally be more strongly associated with behavior-affect congruence than those which foster ego involvement.

2. The subgroup correlation analysis was repeated including impersonal subjects. This analysis revealed a tendency for impersonals to show the same pattern of results as controlled individuals after failure: The correlation between persistence and change in affect for impersonals was $r(22) = -.20, ns$. It should be noted, however, that based on previous work by Koestner et al. (1992) and Ryan et al. (1991) we had offered predictions only for the autonomy versus controlled orientation.

lower level than when they received success feedback. People with an autonomy orientation responded like individuals described by Dweck and colleagues as mastery-oriented, showing resilient persistence and performance after failure. The results for autonomy-oriented college students in the present study match those found for intrinsically motivated children in a study that manipulated success versus failure and measured subsequent motivation in terms of persistence and performance at a related activity (Boggiano & Barrett, 1985). It would seem that autonomy is a valuable resource for coping with difficulties and setbacks (Grolnick, Ryan, & Deci, 1991).

The most interesting response to performance feedback was exhibited by controlled individuals. They showed markedly higher motivation after receiving failure feedback than success feedback. This paradoxical response parallels findings for ego-involved subjects in the studies conducted by Ryan et al. (1991). Because they are intent on proving that they are competent (and thus preserving their self-esteem), controlled individuals probably interpreted the ostensible failure feedback as non-confirming. We would infer that they subsequently displayed heightened motivation because they were striving to prove to themselves that they were, indeed, competent at the activity. Such an attempt to regain their sense of competence makes sense when one recalls that controlled individuals possess high confidence in their abilities (unlike impersonals who share their performance goals but possess low confidence) and that the failure feedback they received was, in fact, relatively mild (39th percentile). We would expect that controlled individuals would show a more maladaptive response, paralleling that of impersonals, if they were to experience more powerful or continuous failure feedback. Of course, an experimental design that varied the extremity or amount of failure feedback would be needed to test this hypothesis.

The results for controlled subjects in the present study can also be interpreted using the framework outlined by Wortmann and Brehm (1975). They predict that reactance will occur when people view an activity as important, engage the activity with the expectation of controlling the outcome, and then experience mild or brief failure feedback. All three conditions may have been met for controlled subjects in this experiment. Reactance can be displayed in the form of greater persistence and effort on subsequent activities. Wortmann and Brehm note, however, that viewing a task as important and believing one has control will not protect one from the effects of helplessness if failure feedback is more powerful and continuous.

The fact that controlled individuals may be vulnerable to motivational deficits after continued failure can be seen in the pattern of relations between persistence and affect for controlled versus autonomous subjects. Unlike autonomous individuals, controlled individuals who persisted at the task after failure reported feeling more pressured, uninterested, and incompetent than when they began the experiment. This phenomenological analysis suggests that controlled individuals are unlikely to possess the inner psychological resources to persevere in the face of repeated failure. That is, they would be unable to recast the situation as one which offers the interesting opportunity to cope with a very difficult challenge.

It should be noted that the way controlled subjects responded to success perfectly parallels Ryan et al.'s (1991) predictions for ego-involved subjects. Because an ego-involved person primarily strives to succeed at an activity in order to confirm or preserve his or her self-esteem, once this success is achieved there is no intrinsic incentive to persist longer. The ego-involved person or the controlled person does not value performing the activity for its own sake.

Sex Differences in Response to Learning versus Performance Goals

Study 2 revealed an unexpected sex difference in the way men and women responded to goals. Women showed greater motivation than men when learning goals were highlighted, whereas there was no sex difference when performance goals were made salient. The fact that men and women were differentially responsive to learning goals is interesting in light of Dweck's (1986) previous work suggesting that females are more likely to suffer motivational deficits related to helplessness than males. Specifically, Dweck (1986) concluded that "[a] tendency toward unduly low expectancies, challenge avoidance, ability attributions for failure, and debilitation under failure has been especially noted in girls, particularly bright girls" (p. 243). As a way to forestall vulnerable children from falling into the helpless pattern of achievement-related thoughts, feelings, and behaviors, Dweck (1986) recommended that schools place more emphasis on highlighting learning goals for students. The present results suggest that women may respond especially well to such learning goals.

Limitations in the Theoretical Framework Presented Here

Our central objective was to call attention to similarities between Deci and Ryan's (1985) causality orientations theory and Dweck and Leggett's (1988) social-cognitive theory of achievement. It is important to note, however, that in pursuing this goal we have somewhat simplified both theories. For example, although we operationalized Dweck and Leggett's constructs in terms of learning versus performance goals, these researchers have more recently moved beyond these measures to focus instead on individuals' theories of intelligence (Dweck, 1991). Thus, they now chiefly consider how possession of an "incremental" versus "fixed" theory of intelligence predisposes children to adopt learning versus performance goals. Deci and Ryan (1991), meanwhile, have developed a more elaborate framework to explain self-regulation since their 1985 presentation of causality orientations theory. They currently highlight a wider continuum of self-determination that ranges from autonomous to impersonal, but that includes several variants of externally regulated behavior (what we have called controlled). Thus, they now carefully distinguish between purely external forms of regulation and more internalized forms of extrinsic regulation such as introjection and identification (Deci et al., 1994; Grolnick et al., 1991; Ryan & Connell, 1989; Vallerand & Bissonette, 1992). Our research would have been more compelling if it had included a broader and more up-to-date assessment of the individual differences currently highlighted by the two sets of theorists.

CONCLUSION

Two experiments examined similarities between Deci and Ryan's (1985) causality orientations theory and Dweck and Leggett's (1988) social-cognitive theory of achievement. It was shown that autonomous college students were likely to adopt learning goals, report high confidence in their abilities, and display equal levels of motivation after failure and success. Controlled students were likely to adopt performance goals, report high levels of confidence in their ability, and to show higher levels of motivation after failure relative to success. However, the persistence of controlled individuals appeared to be pressured and reactive. Impersonal students possessed the classic helpless pattern of performance goals and low confidence in their academic abilities. They responded

to failure with lower performance and less persistence. Together, these results provide support for the utility of causality orientations theory and suggest that it can address some of the phenomena explained by Dweck and Leggett's (1988) social-cognitive theory of achievement.

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Manuscript received June 24, 1991; revised March 15, 1993.

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