Task Difficulty, Self-Handicapping and Performance: A Study of Implicit Theories of Ability

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ARTICLE INFO	ABSTRACT
	Self-theories, or the theories people hold about their own qualities such as abilities, have important consequences for motivation and behavior. Examining self-theories could help us to understand how ability beliefs affect student performance and self-handicapping. The purpose of this study was to assess the impact of self-theories about ability and task difficulty on student performance and use of self-handicapping strategies in sport competitions. In this study, a blocked factorial design was conducted. The subjects were 30 entity and 30 incremental theorists Iranian male students who were divided into four equal sized groups. The first and third groups participated in a 540m track event with a 180-second time limit. The second and forth groups participated in a similar race with a 120-second time limit. After racing, all subjects completed a self-handicapping questionnaire and their performance also was recorded. MANOVA analyses of the resulting data showed incremental students reported fewer self-handicapping strategies for their next race as well as better performance compared with entity participants. These findings were, however, evident in the second competition. Moreover, subjects who participated in the first race, regardless of ability beliefs, did not show significant difference between self-handicapping strategies and performance. The findings highlight that ability beliefs can affect the students' performance and degree of effort; this emerges when fail probability is high.

Introduction

People's lay theories or beliefs provide a pivotal role in interpreting the world (Kelly, 1955). Dweck and her colleagues (Dweck, Chiu, & Hong, 1995) propose that individuals' implicit theories about human attributes would structure the way they interpret and understand human behavior. These implicit theories have been useful in understanding achievement behavior and acted as a belief system, which gave meaning to it (Dweck, 1996). Dweck (1996) defined implicit theories as one's perspective about his or her personal attributes (e.g., ability and personality) being a fixed uncontrollable trait (entity theory) that could not be changed through effort, or a malleable controllable quality that could be increased and improved through effort and investment (incremental theory).

The two theories also lead to different beliefs about the value of effort. When students believe that ability is fixed, then they often devalue the importance of effort. They believe that ability is supreme. Someone who has ability does not need effort, and effort will not help someone who lacks it (Blackwell, Trzesniewski, & Dweck, 2007). To clarify, believing that effort is futile is already enough to put these students at a disadvantage. Even worse than that, they may believe that effort is not just useless but actively harmful. In the

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eyes of these entity students, the more effort they put in, the more they demonstrate and confirm that they lack ability and no amount of effort can bridge the gap between smart and not smart. Thus, effort is not just futile but also dangerous—hard work is seen as a sign of low ability (Covington & Omelich, 1979; Leggett & Dweck, 1986; Nicholls, 1984). In contrast, when students believe that ability is changeable, then effort can be useful. It can help them improve, regardless of their current level of ability. These students with an incremental theory are more likely to endorse statements such as "The harder you work at something, the better you will be at it." Believing in the power of effort helps children choose the path to greater success (Dweck & Master, 2009).

Dweck (1999) represented the implicit theories as a meaning system, which had important consequences for motivation and behavior, particularly in achievement motivation contexts. Students with both theories, as long as they are succeeding readily, their different beliefs about ability may not always have much impact. However, once students begin to encounter or worry about setbacks, their theories become increasingly important in determining how they will respond to those setbacks. In particular, the two theories lead students to explain their setbacks in different ways, and how entity and incremental students explain their failure, effect on how they choose to change (Dweck & Master, 2009).

Failing is usually a sign that students need to change their behavior and study strategies in the future. For those with an entity theory of intelligence, failure is a sign of low ability. By attributing failure to factors outside their control, these students do not change their behavior and they set themselves up to fail again and again. When it came to choosing a strategy for the future, students with an entity theory chose negative strategies that avoided effort (Blackwell et al., 2007). These students show a helpless behavior pattern (Dweck & Master, 2009). Helpless learners did not attribute their successes to action taken, but rather explained them predominantly through uncontrollable causes such as luck or task difficulty. When helpless-pattern learners were encountered by failure, they reduced their aspiration, experienced negative emotions, demonstrated lower levels of persistence, and gave up the task easily (Heyman & Dweck, 1998; Kamins & Dweck, 1999).

In contrast, for those with an incremental theory about intelligence, failure is an indication that that they did not try hard enough. By attributing failure to their own lack of effort, they were poised to take control of the situation and set themselves up to do better in the future. When choosing strategies for the future, the incremental students chose positive strategies based on effort. These students are motivated to work even harder so that they would do better next time. They show a mastery oriented behavior pattern (Dweck, 2000). Mastery oriented learners want to acquire new competencies and to be able to have command of new situations. The information processing of mastery oriented learners is therefore focused on the surveillance of learning process and the search for new strategies that are useful in attaining learning goal. When this learning process is confronted by an obstacle, this is seen as an indication that the wrong strategy had been applied (Dweck & Leggett, 1988; Heyman & Dweck, 1992).

Because performance relative to others is such a meaningful measure of ability within an entity theory, students with an entity theory may take steps to make their performance less meaningful. Specifically, they may deliberately handicap their own performance, in order to blame their failure on something besides ability. Self-handicapping is the tendency to create obstacles to performing well. Although it increases the chances of failure, poor performance can then be blamed on the obstacles, rather than on innate ability. College students who believed that their intelligence was fixed were more likely to engage in self-handicapping behaviors such withholding effort from a task, feigning or claiming sickness, and procrastination (Rhodewalt, 1994).

Jones and Berglass (1978) first described a phenomenon, labeled self-handicapping, in which people create obstacles that make failure more likely, but where presumably that failure is not diagnostic of their abilities. In the event of a failure, one can point to the self-handicap as the reason a better outcome was not obtained and thereby protect self-esteem and conceptions of ability (Feick & Rhodewalt, 1997; McCrea & Hirt, 2001; Rhodewalt et al., 1991). Past research has shown that individuals use a variety of strategies to self-handicap, including withdrawing effort (Hirt, Deppe, & Gordon, 1991; Hirt, McCrea, & Kimble, 2000), listening to distracting music (Shepperd & Arkin, 1989b), or ingesting drugs or alcohol (Berglas & Jones, 1978;

Jones & Berglas, 1978) prior to an important exam or performance. Self-handicapping is more likely to occur when individuals are feeling uncertain about an important performance.

According to the self-worth theory of motivation, ability is closely tied to self-worth and so when there is doubt as to individuals' ability, there is doubt as to their self-worth (Covington, 1992, 2004). A priority of some students, therefore, is to protect their sense of ability and to try to influence others' evaluations of their ability. Self-handicapping is a way students are able to do this. Self-handicapping strategies are self-protective and geared towards protecting individuals' competence in the event of failure (Covington, 2009). Research has also demonstrated that self-handicapping is effective in protecting self-esteem and conceptions of ability in the face of failure. Specifically, the presence of a handicap allows individuals to shift attributions for a poor performance from ability to the handicap (Feick & Rhodewalt, 1997; McCrea & Hirt, 2001; Rhodewalt et al., 1991). In addition, self-handicapping maintains self-evaluations of ability in a specific domain, as well as global self-esteem, despite failure (Feick & Rhodewalt, 1997; McCrea & Hirt, 2001).

According to the self-worth theory (Cavington, 2009) withdrawing effort is a self-handicapping strategy that students may use to protect their sense of ability and worth in the event of a failure. On the other hand, the meaning of effort is different for student with incremental ability beliefs than for students with entity beliefs (Dweck & Master, 2009), but, they may not always have much impact (Dweck, 1999). The current study tested the impact of self-theories about ability and task difficulty on student performance and of self-handicapping strategies in sport competitions. We expected that both entity ability beliefs and high difficult task would reduce performance in track, in contrast to incremental ability beliefs and low task difficulty, because they both induce self-handicapping strategies. Finally, we investigated whether an interaction effect between ability beliefs and task difficulty would emerge so that students with entity beliefs about ability applied to a difficult task would exhibit an even higher level of self-handicapping and lower level of performance.

Method

Participants

Task difficulty and ability beliefs were independent variables in this study, but since the ability belifes is an identity variable and was not manipulated, a blocked factorial design was used. One hundred male physical education trainees who enrolled in a diploma in physical education course in Iran were invited to take part in this study. First, they completed sport ability beliefs questionnaire in a quiet classroom; this took about 15 minutes. Participants were informed that there was no right or wrong answers, assured of the confidentiality of their responses, and encouraged to ask questions if necessary. Both students who did not complete the entire questionnaire and students whom their rating of sport ability beliefs scale was not show their ability beliefs (7 missing), were excluded from the analyses along with. Finally, data were analyzed and 60 students randomly selected from students with incremental and entity beliefs about ability (n = 60, age: M = 15.9, SD = 1.42).

Measures

Sport ability beliefs. The Persian version of 'Conceptions of the Nature of Athletic Ability Questionnaire, Version Two' (CNAAQ-2; Biddle et al., 2003; Wang & Biddle, 2001) was employed to examine incremental and entity beliefs. Incremental beliefs were assessed through six items (e.g., 'to be successful in sport you need to learn techniques and skills, and practice them regularly'). Entity beliefs were measured using six items (e.g., 'it is difficult to change how good you are in sport'). Responses were made on 5-point scales. According to Wang and Koh (2006), these two dimensions of ability beliefs yielded satisfactory internal consistency (Cronbach's alpha coefficients were both .78). In the present study the Cronbach's alpha coefficients were α = .81 (Incremental beliefs), α = .74 (Entity beliefs).

Situational self-handicapping. Participants were presented with a list of 20 claimed self-handicapping strategies, all of which have arisen from previous research (Hausenblas & Carron, 1996; Rhodewalt, Saltsman, & Wittmer, 1984). Using a seven-point Likert scale (*1 = strongly disagree to 7 = strongly agree*), participants were asked to rate the degree to which each claim would disrupt their performance with respect to the specific

experimental task. Example items include 'I didn't sleep well last night' and 'I have been injured'. Using the same seven-point Likert scale response format. Support for the reliability of this measure has been reported in past work (e.g. α = .85; Kuczka & Treasure, 2005). In the present study the Cronbach's alpha coefficients was α = .80.

Performance. A chronometer was used to measure students' running speed or performance at race.

Procedure

A field-based test that permits large numbers of individuals to be tested concurrently, the 580m trace served as the experimental task. The experiment took place within the school's outdoor sports hall during the students' regular classes, which increased its ecological validity. One week before the day of the experiment, students were told to get ready for track. Since the experiment was of a between-subjects design, on the day of the experiment a research assistant who was unfamiliar with the theoretical purpose of the study randomly assigned the subjects divided into four equal sized groups. Each of the first and second groups comprised 15 students with entity ability beliefs and each of the third and fourth groups included 15 students with incremental beliefs about ability. The first and third groups participated in a 540m track event with a 180-second time limit, they had to finish track in 180-second if they didn't want to be loser, and the second and fourth groups participated in a similar race but with a 120-second time limit, they had to finish track in 120-second if they didn't want to be loser. Each participant's running speed was recorded with chronometer. Following the experimental trial, participants were told to get ready for another race to take place two weeks later and were asked to respond to a self-handicapping questionnaire (Hausenblas & Carron, 1996; Rhodewalt, Saltsman, & Wittmer, 1984). Participants were informed that there were no right or wrong answers and assured about the confidentiality of their answers. After the experiment, participants were thanked and debriefed on the purpose of the research.

Data Analysis

The data collected were analyzed in two parts. Initially, descriptive statistics were computed. In addition, the technique of multivariate analysis of variance (MANOVA) was employed.

Findings

Table 1 presents the means and standard deviations for the two dependent variables, performance and self-handicapping, in the different experimental conditions.

Table 1. The performance and self-handicapping means and standard deviations of the four experimental conditions (N= 60)

	180-second time limit race		120-second time limit race	
	M	SD	M	SD
Entity beliefs	(n_1=15)		(n_2=15)	
Performance	147.53	1.52	163.53	1.47
Self-handicapping	3.133	1.55	5.267	1.68
Incremental beliefs	(n_3=15)		(n_4=15)	
Performance	148.86	1.18	144.00	1.11
Self-handicapping	3.067	1.70	2.867	1.40

As Table 1 shows the worst performance and the highest use of self-handicapping sterategies were found in subjects with entity belifes who were participate in 120-second time limit race, and the best performance and the lowest use of self-handicapping sterategies were found in subjects with incremental belifes in 120-second time limit race.

Performance and self-handicapping were investigated using the two-way multivariate analysis of variance (MANOVA) technique. MANOVA was conducted to determine the effect of group differences on the dependent variables (performance and self-handicapping). Table 2 shows the results of the analyses of variance in terms of single variables differences and the combined effects. Significant differences were found for the four types of differences in dependent measures.

Table 2. The F values for Pillai's procedure

	value	F	hypoth. df	error df	sig of F
Ability beliefs	.785	4.84•	2	55.00	.000
Task difficulty	.999	4.35•	2	55.00	.000
Interaction effect	.856	13.973•	6	112.00	.000

•*P*<.025

The *F* values for Pillai's trace were statistically significant about ability beliefs, *F* (2, 55) = 4.84, *p* < .025 and Task difficulty, *F* (2, 55) = 4.35, *p* < .025 and for interaction effects *F* (2, 112) = 10.71, *p* < .025. Subsequently, two-way analyses of variance (ANOVA) were performed for each of the dependent variables as follow-up tests to the MANOVA, as reported in Table 3.

Table 3. Univariate F-test

Dependent variable		SS	MS	F	sig of F
Ability beliefs	*performance*	2740.583	913.528	53.873•	.000
	Self-handicapping	57.250	19.083	18.640•	.000
Task difficulty	*performance*	2965.783	988.594	61.705•	.000
	Self-handicapping	60.667	20.222	20.319•	.000
Interaction effect	*performance*	1376832.017	1376832.017	8.594•	.000
	Self-handicapping	770.417	770.417	752.500•	.000

•*P*<.025

Results of Table 3 show that both main effects and interaction effect impacts on changes in performance and self-handicapping (for all, *p* < .025). Subsequently, because the F values were statistically significant, follow-up contrast analyses with the Benferroni test were performed for each of the dependent variables, as reported in Tables 4 and 5.

Table 4. Follow-up contrast analyses with Benferroni test for Self-handicapping

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	sig.
	1	2	-2.2000•	.36428	.000
		3	.0667	.36428	1.000
		4	.2667	.36428	1.000
	2	1	2.2000•	.36428	.000
		3	2.2667•	.36428	.000
		4	2.4667•	.36428	.000
Self-handicapping	3	1	-.2667	.36428	1.000
		2	-2.4667•	.36428	.000
		4	.2000	.36428	1.000
	4	1	-2.2000•	.36428	1.000
		2	.2667	.36428	.000
		3	-.2000	.36428	1.000

•*P*<.025

Results of Table 4 shows participants in group 2 reported significantly more Self-handicapping strategies compared with participants in other groups. No significant differences found between other groups in using of self-handicapping strategies. In other word, subjects with Entity beliefs who participated in the high level of task difficulty (120-second time limit) condition showed the most using of self-handicapping strategies.

Table 5. Follow-up contrast analyses with Benferroni test for performance

Dependent Variable	(I) group	(J) group	Mean Difference(I-J)	Std. Error	sig.
Performance	1	2	-16.0000•	1.46157	.000
		3	-1.3333	1.46157	1.000
		4	3.5333	1.46157	1.000
	2	1	16.0000•	1.46157	.000
		3	14.6667•	1.46157	.000
		4	19.5333•	1.46157	.000
	3	1	1.3333	1.46157	1.000
		2	-14.6667•	1.46157	.000
		4	4.8667	1.46157	.329
	4	1	-1.5333	1.46157	1.000
		2	-17.5333•	1.46157	.000
		3	-4.8667	1.46157	.329

•$P<.025$

Results of Table 5 shows participants in the second group reported significantly lower running speeds compared with participants in other groups. No significant differences found between other groups in performance. In other word, subjects with an entity beliefs who participated in the high level of task difficulty (120-second time limit) condition showed the least running speed.

Discussion

The implicit personality theory (IPT; Dweck, 2000) posits that people's lay theories or beliefs about their ability have important consequences for motivation and behavior, particularly in achievement motivation contexts. The purpose of the current study was to examine the impact of sport ability beliefs and task difficulty on students' performance and self-handicapping strategies in sport competitions. Specifically, it examined the implicit theory (Dweck, 1999) in combination with self-worth theory (Covington, 1992, 2004), and the role of ability beliefs in the effects of task difficulty level on performance and the use of self-handicapping strategies. The results supported the hypotheses and demonstrated that students who believed that their abilities were global and enduring used more self-handicapping strategies and had a worse performance compared to students with incremental beliefs about their abilities. These findings are consistent with McCrea and Hirt (2001), Kray and Haselhuhn (2007), Chen et al, (2008), Aronson et al. (2002), and Good, Rattan, and Dweck (2007). On the basis of IPT (Dweck, 1999), for students with an entity ability belief, the need for high effort is a sign of low ability and incompetence; therefore, they may fail intentionally in order to attribute failure to factors outside their ability. Intentional reduction of effort is a self-handicapping strategy which may set students up for a sense of contingent self-worth (Burhans & Dweck, 1995; Kamins & Dweck, 1999; Mueller & Dweck, 1998). Nonetheless, students with entity beliefs used self-handicapping strategies and had low performance under challenging conditions with a high level of task difficulty. Results indicated that subjects who participated in a task with a low level of difficulty, regardless of their ability beliefs, did not show significant difference in self-handicapping strategies and performance. These findings are consistent with Blackwell et al. (2007), Anderman, Griesinger, & Westerfield (1998), Mueller & Dweck (1998), and Nussbaum & Dweck (2008).

It seems that task difficulty and ability beliefs interaction is a better predictor of self-handicapping behaviors and performance. Such a finding is important to those concerned with self-handicapping behaviors in competitions. On the basis of IPT (Dweck & Master, 2009), as long as students with both theories are succeeding readily, their different beliefs about ability may not always have much impact. Once students begin to encounter or worry about setbacks, however, their theories become increasingly important in determining how they will respond to those setbacks. In particular, the two theories lead students to explain their setbacks in different ways. An unexpected finding has been found, but was not significant: subjects with incremental beliefs had a better performance in difficult track events, in comparison with incremental

theorists who participated in easy events. This result provides further evidence for the hypothesis that setbacks trigger ability beliefs.

In the current study, the race in which the second and fourth groups participated, a 540m track event with a 120-second time limit, was a high level difficult task and could trigger ability beliefs to play their roles. For entity theorists having to try hard is a sign of low ability and confirms that they must not be very smart. Therefore, they are looking for a way to protect their self-worth despite their poor performance, and self-handicapping is one option. As was observed in this race, students with entity ability beliefs showed more self-handicapping behaviors and lower achievement in comparison with incremental theorists. These findings, however, did not appear for members of the first (entity theorists) and third (incremental theorists) groups who participated in a 540m track event with a 180-second time limit. This race was not a difficult situation and students were not placed under evaluation so the race did not spark students' ability beliefs. For entity theorists, achievement situations carry important information about the self. Therefore, when they failed a task and give "helpless" explanations for their failure, they may take steps to make their performance less meaningful. Specifically, they may deliberately handicap their own performance, in order to blame their failure on something besides ability. Self-handicapping is the tendency to create obstacles to performing well. Although it increases the chances of failure, poor performance can then be blamed on the obstacles, rather than on innate ability. Through attributing failure to factors besides ability, these students save their self-worth.

Conclusion

Despite the limitations, the findings from the present study have important implications. They suggest that students' ability beliefs could affect the use of self-handicapping strategies and in turn their performance in sport competitions; but ability beliefs could only do this if they have been activated. When students are faced with a difficult task or test, their self theories about ability rise up and become increasingly important in determining how they will respond to situations and try to protect self-worth. Because setbacks and difficult tasks indicate high probability of failure, students with an entity theory about ability explain them as a sign that they are not able enough. For them, effort is futile, useless and harmful; the more effort they put in, the more they demonstrate and confirm that they lack ability. In the eyes of these entity students, the ability and effort relation is reversed; therefore, they may set up self-handicapping strategies for a sense of self-worth. Kamins and Dweck (1999) have shown the more students believed that their ability is a fixed trait; the more they believed that avoiding failures and attaining successes was necessary to maintain their sense of worth. It is also possible that pride and positive self-esteem can be enhanced if success is achieved despite the handicap. In attributional terminology (Kelley, 1973), self-handicappers can discount ability attributions for failure by blaming the handicap, but can augment ability attributions following success. In contrast, when students believe that ability is changeable, then effort can be useful. It can help them improve, regardless of their current level of ability. These students with an incremental theory are more likely to endorse statements such as "The harder you work at something, the better you will be at it." Believing in the power of effort helps children choose the path to greater success. In summary, our argument so far is that for some individuals, achievement situations have deeper meaning about the self and that one cannot understand the dynamics of achievement motivation without taking this into account.

From a practical point of view, since entity students do not change their behavior, they set themselves up to fail again and again. When it comes to choosing a strategy for the future, they choose negative strategies, such as self-handicapping, that avoid effort and resort to potentially counterproductive methods of coping with failure, such as cheating, lying, or looking for people who did worse than they did (Blackwell et al., 2007). They exhibit a maladaptive motivational pattern, negative cognitions, negative affect, reducing effort and aspiration, demonstrating lower levels of persistence and giving up the task easily (Heyman & Dweck, 1998; Kamins & Dweck, 1999), choosing downward comparison (Nussbaum & Dweck, 2008). Incremental beliefs about ability should be encouraged to reduce self-handicapping behaviors. For people with an incremental theory, ability is seen as malleable, controllable and effort changeable. They demonstrate more

adaptive patterns, characterized by positive thoughts, positive affect, and effective problem-solving strategies (Dweck, 1986, 1999; Dweck & Leggett, 1988; Heyman & Dweck, 1992).

Incremental form of self-theories may be developed by: providing the students with opportunities to experience self-esteem, self-determination and autonomy; providing increased opportunities for student input, guidance in the form of clear expectations and useful feedback; facilitating students' problem solving, helping them to work to their full potential and show their competence; identifying a link between their behavior and desired outcomes; emphasizing and acknowledging the students' concerns about failure and about close and challenging competitions so that the students feel understood and accepted. Therefore, physical education teachers can readily influence students' beliefs. By praising students for their effort and giving feedback about the process of learning, they can send the message that working hard and thoughtfully leads to greater success. They also send the message that hard work and progress are what they value, not natural, effortless, mistake-free brilliance that involves no learning.

Limitations and Future Research

The current study is not without its limitations. First, as female and male physical education classes are separated in Iran; female students were not included in the study. Second, just a single measure of self-handicapping (self-handicapping scale) was used, it seems interview and behavioral observations could give useful information about strategies which students use in self-handicapping. Third, the cross-sectional nature of the research design only allowed for a slice-in-time study. Fourth, we did not control teachers' beliefs about ability; they may have an effect on dependent variables. Hence, future research might examine whether the present findings among male adolescents could be generalized across female students. Future studies can look at both self-report and behavioral self-handicapping. Moreover, they can examine teachers' beliefs about ability on pupils' motivation in PE.

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