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The Effects of Goal Type, Learning Interest, and Task Difficulty on Learning English Words

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Abstract. Within the past few decades, goal-setting research has emerged as a prominent approach to motivation. However, little is known about the relationship among goal types, learning interest, and task difficulty. Using a 3 x 4 x 3 mixed experimental design, one hundred middle school students with different levels of learning interest (strong, moderate, and weak) in the present study were asked to learn English words of different levels of difficulty (high, medium, and low) under the context of different goal orientations (mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance). Our results mainly showed that: (a) the main effects of learning interest, goal types, and task difficulty on performance were all significant; and (b) the interaction between goal type and task difficulty on performance was significant. Important educational implications are discussed as well as limitations and future directions.

Keywords: Achievement goal; Interest; Task difficulty.

Introduction

The topic of Goal-setting has become an underlying component of the research on academic motivation (van Dam, 2014). Goal-setting theory was formulated on the basis of Ryan's (1970) belief that conscious goals influence action, which through four mechanisms. Specifically, goals are directive (Rothkopf & Billington, 1979), energizing (Bandura & Cervone, 1983); also, goals affect persistence (LaPorte & Nath, 1976) and lead to the active use of task-relevant knowledge, skills, and strategies (Wood & Locke, 1990). The primary interest of industrial-organizational

psychologists in predicting, explaining, and influencing performance has directed goal-setting researchers' focus toward the relationship between performance goals and level of task performance (Locke & Latham, 2002).

Goal-setting theory maintains that the goal itself has an incentive effect, which can turn people's needs into motivation, make people's behavior accord with a planned direction, and contrast the results of their own behavior to the established goal to assess the discrepancy and fill the gap between them timely so that the goals can be achieved ultimately (Cao & Liu, 2011). Since the mid-1980s, many attempts have been made to distinguish between mastery goals (aiming to develop and gain one's competence) and performance goals (aiming to demonstrate one's competence relative to others) (e.g., Ames & Archer, 1988; Nicholls, 1984; Preenen, van Vianen, & De Pater, 2014). Later, researchers began to realize that approach-avoidance was also a primary distinction that deserved a core position in the conceptualization and classification of goal types (Elliot, 1999; Pintrich, 2000a). According to these researchers, approach goals were directed toward positive or desirable events, whereas avoidance goals were aimed at avoiding negative or undesirable events. Therefore, adding the goal valence dimension to the theory allows both mastery and performance goals to be framed in either an approach manner or an avoidant manner (Senko & Hulleman, 2013), leading to four specific goal types, which are mastery-approach, performance-approach, mastery-avoidance, and performance-avoidance goals. The mastery-approach goal is a goal orientation improving individuals' own ability as a pursuit of learning through cultivating the sensitivity of individual perception and the autonomy of behavior and emphasizing on the close relationship between learning and growth (see Dysvik & Kuvaas, 2010). The mastery-avoidance goal is a goal orientation that individuals actively adopt various measures trying to evade any performances of their own imbecility as a pursuit of learning (Madjar, Kaplan, & Weinstock, 2011). The performance-approach goal is a goal orientation that individuals try best to demonstrate their ability and expect to get a positive evaluation on the ability from others as a pursuit of learning (Roussel, Elliot, & Feltman, 2011). The performance-avoidance goal is a goal orientation that individuals try to evade the comparison with others which displays their imbecility or negative evaluations by others on their own ability as a pursuit of learning (Smillie, 2008; Law, Elliot, & Murayama, 2012). Building on the 2 × 2 goal framework, much research has emerged examining the role of each goal type in learning performance (e.g., Cury et al, 2006; Elliot & Murayama, 2008; Murayama et al., 2011).

An important theoretical framework underlying research on goal setting is that students are motivated by their personal dispositions as well as the environments (Ames, 1992b; Maehr, 1984; & Nicholls, 1989). Also, Tuominen-Soini, Salmela-Aro, and Niemivirta (2011) suggested that in a given situation, students tend to adopt goals depending on both dispositional tendencies and external settings. In other words, the student's goal orientation does not remain unchanged and may vary depending on different settings in which they find themselves. Patrick, Kaplan, and Ryan (2011) conducted a study showing that perceived classroom mastery goal structure correlates substantially with perceptions of the teacher as promoting classroom mutual respect and providing emotional and academic support and relates closely to perceiving the teacher as promoting student learning-related discussion. Tuominen-Soini, Salmela-Aro, and Niemivirta (2011) offered evidence for change in achievement goal orientations over time although the changes were small.

The Relationship among Learning Interest, Goal Types, and Task Difficulty

It has been acknowledged that mastery goals are closely aligned with intrinsic motivation and thus are deemed directly relevant to a framework articulating motivation and engagement (Brophy, 2005). Although most studies positioned mastery goals as a more effective motivational orientation, the debate as to mastery-oriented goals versus performance-oriented goals has never ceased. For instance, Martin (2007) found that mastery goals are more positively associated with educational aspirations, class participation, and enjoying school than are performance goals, whereas Kaplan & Middleton (2002) pointed out that performance-approach goals may contribute to positive outcomes in competitive learning environments; or may be connected with certain types of positive outcomes such as achievement. Besides, Harackiewicz et al. (2002) identified positive potential of performance-approach goals and ways performance-approach goals can be integrated with mastery goals to enhance optimal motivation. In response to the debate and research findings that have been diffuse, we reasonably argue that the advantage of specific goal orientations may depend on certain individual characteristics and/or contextual factors such as task difficulty.

Goal setting has become one of the most important motivational factors believed to influence achievement (Elliot, 2005; Anderman et al, 2006; Kaplan & Maehr, 2007). At the same time, a robust body of studies (Ryan & La Guardia, 1999; Renninger, 2000; Hidi, 2006) in the field of interest

showed that situational and/or individual interest had an enormous impact on learning outcomes. Harackiewicz, Barron, Tauer, and Elliot (2002) provided empirical evidence that the students' learning interest was positively associated with their final achievements. Goal setting and interest, conceptualized as two affective factors, however, have not received adequate attention in terms of potential interactions between them. Among the few is the study conducted by Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008) suggesting that initial interest motivates individuals to adopt mastery goal approach and then this approach can facilitate the development of interest. In addition, although Senko and Harackiewicz (2005) focused on the effects of achievement goals and interest, they only investigated the mastery-approach and performance-approach goals.

Besides individual characteristics, many studies argued that learning activity relevant features such as task difficulty plays a critical role in performance (e.g., Chae, Seo, & Lee, 2015; Marshall & Brown, 2004). There are few studies conducted on the relations between goals and task difficulty. Among the exceptions, Kuman and Jagacinski (2011) found that increasing levels of difficulty lead to declining levels of performance-approach goals and increasing levels of work-avoidance goals. Li, Lee, and Solmon (2007) examined task difficulty in relation to self-perceptions of ability, intrinsic value, attainment value, and performance and found that initial self-perceptions of ability negatively predicted perceptions of task difficulty. However, research on the moderation effect of task difficulty on the goal-outcome relationship has received less than adequate attention, making the need for taking task difficulty and goal type as two factors predicting learning outcomes pressing.

In summary, given the dearth of studies on investigating learning outcomes from an integrated perspective, research is needed to clarify the complex relationship among goal type, learning interest, and task difficulty. Overall, we raised two hypotheses: (1) Significant main effects of learning interest, goal type, and task difficulty are expected; and (2) a significant interaction among learning interest, goal type and/or task difficulty on the achievement is expected. Given that goal orientations can be changed depending on different environments according to the literature we just reviewed, the present study set four learning scenarios determined by different instructions under which participants were hypothesized to develop a certain type of goal orientation.

Method

Participants and Design

Two hundred and forty students (124 girls and 116 boys) from 20 classes of 11 middle schools in China participated in the formal study. Participants' mean age was 14.5 years (*SD* = 0.82). All participants were Chinese and most of them had learned English as the second language for 3 years. A 3 (learning interest) by 4 (goal type) by 3 (task difficulty) mixed experimental design was used, in which both learning interest and goal type were between-subjects variables whereas task difficulty was a within-subjects variable. Participants in each interest condition were randomly assigned to one of the four goal-type conditions.

Materials

Learning material was a sheet where English words were presented. All the words were classified into three categories according to three difficulty levels (high, medium, and low), with each category consisting of 40 words. The difficulty level was determined by the length of words. Specifically, words composed of eight letters were considered as high-difficulty (e.g., abidance); words of six letters (e.g., castle) were considered as medium-difficulty; and words of four letters (e.g., lava) were considered as low-difficulty.

Measures

Students' mid-term scores were used as a pretest measure. A one-way analysis of variance (ANOVA) showed no significant differences among the conditions.

Students' interest in learning English was assessed by a 7-point Likert-scale including one item (*How much are you interested in learning English?*) ranging from 1 (not interested at all) to 7 (very much interested). Responses ranging from 1 to 2 indicated weak learning interest; 3 to 5 indicated medium learning interest; and 6 to 7 indicated strong learning interest.

Students' learning performance was assessed by a recognition test. The ratio of the number of words in the recognition test to the number of words in the learning phase is 2.5:1. The similarity between old and new words was controlled in two ways (the same length and the same structure). There were 40 words presented on the reading material and 100 words presented on the recognition test. Each student was given one point by correctly recognizing a word, yielding a possible score ranging from 0 to 100.

Procedure

Before the formal experiment was carried out, we recruited 800 students randomly from 11 middle schools in Shanghai to complete a survey regarding learning interest about six main subjects including politics, geography, Chinese, English, mathematics, and history. The participants rated on a 7-point Likert-scale ranging from 1 (not interested at all) to 7 (very much interested). Responses of 1-2 indicated weak learning interest; 3-5 indicated medium learning interest; and 6-7 indicated strong learning interest. Eight hundred questionnaires were distributed and 767 questionnaires were collected. According to the results of the survey, students' interest in learning English was comparatively evenly distributed on three levels, which were strong, medium, and weak. Therefore, English words as learning material were selected in the present study.

Next, 80 students were randomly selected by the experimenter out of those with strong interest in English; 80 students were randomly selected out of those with medium interest in English; and 80 students were randomly selected out of those with weak interest in English, yielding a total of 240 final participants in the present study.

Different types of goals were designed based on different instructions given. The instruction used to set up the mastery–approach goal was: *We welcome you and appreciate your willingness to take part in this study. There are 40 words in the sheet. Please learn as many words as possible when you read them. At the end, the more words you can remember the more rewards you will get.* The instruction used to set up the mastery–avoidance goal was: *We welcome you and appreciate your willingness to take part in this study. There are 40 words in the sheet. Please learn as many words as possible when you read them. In the end, you can leave early if you remember more; otherwise you will have to stay and clean the classroom together with the experimenters.* The instruction used to set up the performance-approach goal was: *We welcome you and appreciate your willingness to take part in this study. There are 40 words in the sheet. Please learn as many words as possible when you read them. In the end, the higher your ranking is, the more rewards you will get.* The instruction used to set up the performance-avoidance goal was: *We welcome you and appreciate your willingness to take part in this study. There are 40 words in the sheet. Please remember as many words as possible when you read them. In the end, if you rank higher, you can leave early; if you rank lower, you will have to stay and clean the classroom together with the experimenters.*

In each goal condition aforementioned, the students were then required to read and memorize the English words in 30 minutes. After the 30 minutes had passed, the students were required to work on the recognition test. After the answer sheet had been collected, the participants were thanked, debriefed and dismissed.

Results

Main Effects

Before we analyzed the data, all variables were examined for assumptions of parametric data. No univariate or multivariate outliers were identified (Tabachnick & Fidell, 2012). Given that the assumption of sphericity was violated based upon the Mauchly's test resulting in the variations across different conditions (high difficulty, medium difficulty, and low difficulty) that are not similar, the Greenhouse-Geisser correction was employed to produce a valid F-ratio (Field, 2013).

Table 1: Descriptive statistics of achievements for different levels of task difficulty, goal types, and learning interest.

Interest		*Mastery-approach goal*			*Mastery-avoidance goal*			*Performance-approach goal*			*Performance-avoidance goal*		
		strong	general	weak	strong	general	weak	strong	general	weak	strong	general	weak
task difficulty (high)	M	78.0	77.5	73.5	70.9	60.35	49.9	78.0	68.5	59.2	73.8	63.8	60.2
	SD	10.7	11.1	13.1	10.8	13.0	15.2	13.8	14.8	13.5	14.2	13.4	11.5
	MSE	2.39	2.48	2.93	2.42	2.91	3.40	3.09	3.31	3.02	3.18	3.00	2.57
task difficulty (medium)	M	85.2	81.9	78.6	77.6	65.4	59.1	85.9	84.2	75.9	75.9	73.5	70.3
	SD	10.1	9.2	14.8	13.9	16.9	15.0	11.2	12.0	14.4	11.8	13.6	14.8
	MSE	2.26	2.06	3.31	3.11	3.78	3.36	2.51	2.68	3.22	2.64	3.04	3.31
Task difficulty (low)	M	87.9	82.4	80.9	91.7	88.9	86.9	85.6	79.2	78.2	93.1	89.1	82.9
	SD	9.1	8.5	12.9	5.8	7.3	9.0	9.4	9.8	11.4	5.7	8.1	10.6
	MSE	2.04	1.90	2.89	1.30	1.63	2.01	2.10	2.19	2.55	1.28	1.81	2.37

Achievement test score means and standard deviations were reported in Table 1 for between-subjects and within-subjects variables. The result demonstrated that the main effect of the learning interest was significant, F (2, 228) = 54.21, MSE = 135.97, $p < .01$; partial eta squared = .32. When learning interest was strong, moderate, and weak, the mean achievement scores were M = 81.66; M = 76.17; and M = 70.58 respectively. In addition, the main effect of goal types was significant, F (3,228) = 12.18, MSE = 135.97, $p < .05$; partial eta squared = .138. It is apparent that the descending order of achievement for each different goal type was: mastery-approach goal, performance-approach goal, performance-avoidance goal, and mastery-avoidance goal (Table 2). At the same time, the main effect of task difficulty was also significant, F (2, 228) = 110.30,

MSE = 149.75, $p < .01$; partial eta squared = .33.

Table 2: Descriptive statistics of achievements for different goal types

	Mastery-Approach	*Performance-approach*	*Performance-avoidance*	*Mastery-avoidance*
M	80.65	77.18	75.84	72.3
SD	11.06	12.26	11.52	11.88

Interactions

The results of univariate tests showed that generally, there was no significant interaction among learning interest, goal type, and task difficulty on achievement, F (12, 228) = 1.04, p = .413, partial eta squared = .027. In addition, the interaction effect between learning interest and goal types in between-subjects was not significant, F (6, 228) = 1.94, p = .075, partial eta squared = .049. The interaction effect was also not significant between learning interest and task difficulty, F (5, 228) = 1.27, p = .24, partial eta squared = .011. However, a significant interaction effect (see Figure 1) was detected between goal type and task difficulty, F (6, 228) = 18.70, $p < .001$, partial eta squared = .198.

We specifically focused on the goal type – task difficulty relation given its significant interaction. The analysis of simple effect revealed that, with high difficulty, the descending order of achievement for each different goal type was: mastery-approach goal, performance-approach goal, performance-avoidance goal, and mastery-avoidance goal. Using Tukey's honestly significantly difference (HSD) post-hoc test with alpha less than .05, it was found that there was no significant difference between the performance-approach goal and the performance-avoidance goal ($p > .05$). For the remaining contrasts, significant differences were detected. The analysis of simple effect with moderate difficulty portrayed the descending order for each different goal type as: performance-approach goal, mastery-approach goal, performance-avoidance goal, and mastery-avoidance goal. The HSD test showed that there was no difference between the performance-approach goal and the mastery-approach goal or between the performance-avoidance goal and the mastery-avoidance goal (both ps > .05), whereas there were significant differences for the remaining contrasts. With low difficulty, the descending order for each different goal type was: mastery-avoidance goal, performance-avoidance goal, mastery-approach goal, and performance-approach goal. The HSD test showed that there was no significant difference between the mastery-

avoidance goal and the performance-avoidance goal or between the mastery-approach goal and the performance-approach goal (both ps > .05) while significant differences for the remaining contrasts.

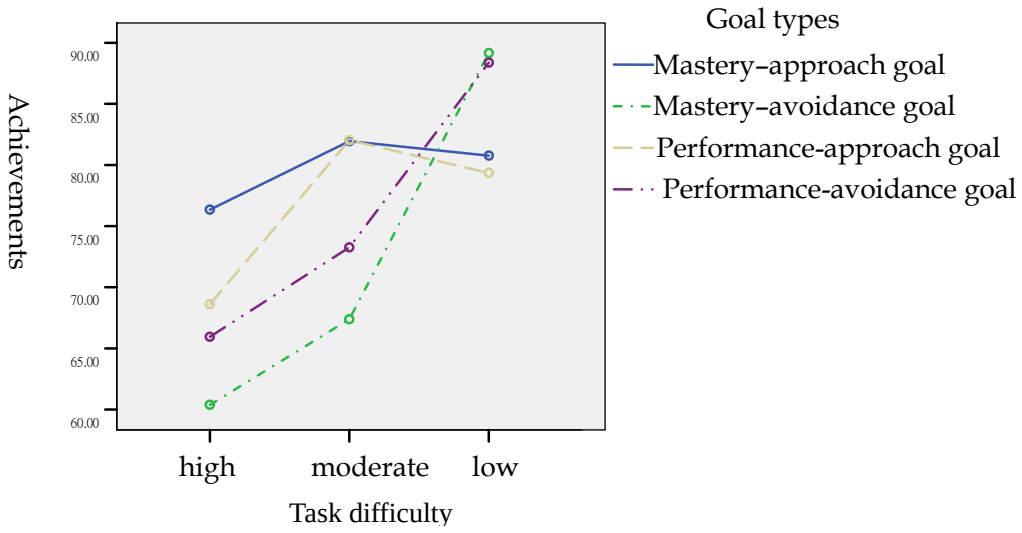

Figure 1: Interaction between goal types and task.

Discussion

One important aim of the present study was to examine the main effect of learning interest. As hypothesized, this study demonstrated that the main effect of the learning interest was statistically significant. That is, the interest effect is independent of other factors (e.g., goals and task difficulty in this study), which can be interpreted as: the stronger the learning interest is, the better the performance is expected. The result is consistent with findings from previous research (Hidi, 2000; Van Yperen, 2003; Harackiewicz & Hulleman, 2010). From the perspective of emotional psychologists (Smith, Sansone, & White, 2007; Renninger, 2009), serving cognitively and emotionally, interest is considered to be underlying intrinsically motivated behavior and central to the amplification and direction of attention and thus increases cognitive engagement and promotes understanding.

As expected, we found that when the level of task difficulty was high, the individuals setting mastery-approach goal outperformed those who had other goal orientations. It is possible that the mastery-approach goal is closely related to individuals' self-improvement and growth. In order to develop their competence and/or task mastery, individuals tend to consider the task of high difficulty as an opportunity to improve, which enables them to concentrate on the task and engage in learning activities

accomplishing it actively and passionately, and thus facilitates their learning. This finding can be interpreted by the desirable-difficulties hypothesis - namely, that creating difficulties for the leaners during meaningful acquisition can actually promotes retention and transfer (Bjork, 1994; Yue, Bjork, & Bjork, 2013). Given that mastery-approach goals contribute to arousing intrinsic motivation, this finding partly aligns with the study conducted by Anshel and Weinberg (1992), who found that difficult goals increased intrinsic motivation, whereas easy goals decreased intrinsic motivation. Also, the finding is in accordance with the study by Izadikhah, Jackson, and Loxton (2010). For individuals who set performance-approach goals, they performed the second best among the four goal types. It may suggest that when faced with difficult tasks, individuals view outperforming their peers on difficult tasks as a way to gain confidence and recognize their own ability, which would stimulate their motivation and enhance learning outcomes. However, the individuals who set the mastery-avoidance goal were outperformed by those driven by all the other three goal orientations. One possible explanation is that although mastery goal prompted the individual to strive hard, meanwhile the inclination of avoidance when dealing with the tasks of high difficulty might cause the individual to struggle and thereby incur the approach-avoidance conflict, which could lead to learning anxiety and distraction and thus overload the individual's working memory resulting in poor performance (Elliot & McGregor, 2001; Van Yperen, Elliot, & Anseel, 2009).

For the low-difficulty task, however, we found that those setting the mastery-avoidance or performance-avoidance goal outperformed those who set the mastery-approach or performance-approach goal. In other words, regardless of that the individual prefers to gain their own mastery or compares their competence with others', the avoidance of undesired consequences serves as a primary drive of effortful involvement in learning activities when the difficulty level of the task is low. Although the finding is in contrast to some other research revealing avoidance goals have a hindering effect on learning (Bartels & Magun-Jackson, 2009; Brodish, & Devine, 2009; Luo et al, 2011; Bong, Hwang, Noh, & Kim, 2014), it may be the case that given the task is of low difficult, the tendency of avoidance will not lead to the overloading effect from the approach-avoidance conflict. As per mastery-approach goals, individuals don't hold the belief that completing an easy task is beneficial enough to assist them in gaining competence or mastery. Hence, when they are in a learning environment shaped by mastery-approach goals, their attention may be distracted, which can harm performance. Likewise, they tend to

think that their completion of an easy task is not a convincing indicator of their better competence relative to others because they believe that most people would be able to reach the same desired level of performance easily.

In conclusion, the results of the present study provide two crucial educational implications that educators may consider. First, the finding that increased learning interest leads to better performance when the goal type and task difficulty remain constant suggests that teachers and parents should make effort to arouse students' learning interest at any time. In addition, since the interaction between goal types and task difficulty was significant, teachers and parents should pay attention to assessing different goal types to set an appropriate one depending on the difficulty level of a specific task.

Limitations and Future Research Directions

A major limitation of the present study is our exclusive focus on junior middle school students in the context of remembering English words. In order to improve the generalizability and fully understand the interactional relationship among goal types, interest, and task difficulty, future studies may examine the 3 × 4 ×3 model with college students and with students in other subject matters such as mathematics.

Another drawback is that it might not make sense to distinguish different levels of difficulty merely by classifying words based on the number of letters each word consists of. It is possible that words are to be learned consisting of more letters would turn out to be easier ones as compared words of less letters because certain patterns and roots could be recognized in long words, rendering memorizing them more efficient. Future research is needed to evaluate the difficulty level from the angle of learners (i.e., self-reported difficulty).

We analyzed task difficulty as the within-subjects variable due to the limited number of students. A limitation associated with asking the same student to work across different tasks and take different tests is that there might be threats to internal validity. For example, although the learning materials varied in content (words of 4 letters, words of 6 letters, and words of 8 letters), they were presented in the same form (words after words), resulting in practice and/or familiarity the students gained after each test that could be mistaken for treatment effects. Therefore, future studies recruiting more participants and operationalizing task difficulty as a between-subjects variable may reduce potential threats to internal

validity and further elucidate the relation between task difficulty and goal types.

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