

## Examining the Relationship between Epistemic Curiosity and Achievement Goals

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### Abstract

*Problem statement:* Although the prominent role of epistemic curiosity in students' achievement goals has long been emphasized in educational research, there is only one study in which the relationship between epistemic curiosity and achievement goals were empirically investigated. However, given the well-evidenced educational importance of both achievement goals and epistemic curiosity, it can be said that it is important to examine the relationship between them in order to explore the epistemic roots of students' achievement goals in settings, such as universities, which are achievement based. Thus, the present study has examined the relationship between epistemic curiosity and achievement goals.

*Purpose of study:* The aim of this study is twofold. First, it is to examine the relationship between students' achievement goals and epistemic curiosity; and second, it is to examine the role of epistemic curiosity as the predictor of students' achievement goals.

*Method:* Based on the survey method, a total of 309 undergraduate students voluntarily participated in the study. The Epistemic Curiosity Scale was used to assess students' curiosity as feeling of interest whereas the Curiosity as Feeling of Deprivation Scale was used to assess students' feelings of uncertainty and tension that motivated students' information-seeking and problem-solving behavior. Students' achievement goals, however, were assessed by the Achievement Goal Questionnaire. One-sample t tests, correlation, and hierarchical regression analyses were conducted to answer the research questions.

*Findings and Results:* The descriptive results of the study showed that both students' curiosity as a feeling of deprivation and as a feeling of interest were at relatively high levels. Students also tended to adopt both a performance-approach and a mastery goal over performance-avoidance goals. Contrary to the expectations, the results of the hierarchical

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regression analysis demonstrated that not curiosity as a feeling of interest, but curiosity as a feeling of deprivation significantly predicted students' achievement goal orientations.

*Conclusions and Recommendations:* The present study revealed that students' epistemic curiosity, especially in the curiosity as a feeling of deprivation form, significantly correlated with students' mastery goals and performance-approach goals. Therefore, it is reasonable to suggest that the epistemic nature of students' curiosity, especially in the curiosity as a feeling of deprivation form, should be considered both in educational settings and future research.

**Keywords:** Epistemic curiosity, achievement goals, undergraduate students, hierarchical regression analysis

Achievement goals (AGs) are defined "as the competence-relevant purposes or aims that individuals strive in achievement settings" (Elliot, Shell, Henry, & Maier, 2005, p. 630). In other words, "achievement goals reflect desire to develop, attain or demonstrate competence in an activity" (Okun, Fairholme, Karoly, Ruehlman, & Newton, 2006, p. 255). Epistemic curiosity (EC), on the other hand, "reflects a desire for new information that motivates knowledge acquisition/exploratory behavior" (Litman, Hutchins, & Russon, 2005, p. 559), or shortly, it reflects "a drive to know" (Berlyne, 1954, p.187).

Despite the fact that both of these research areas are important in educational settings, few studies have directly examined the relationship between students' AGs and EC (Litman, 2008). More specifically, although the prominent role of EC in students' AGs was emphasized in previous research (Elliot, 1999), it has not directly been addressed to date (see Litman, 2008 for one exception). Given the well-evidenced educational importance of both AGs (e.g. Elliot, 1999) and EC (e.g. Chak, 2007), it can be said that it makes sense to examine the relationship between students' AGs and EC for at least one important reason. Accordingly, examining the EC as the predictor of students' AGs may help us in searching the epistemic roots of AGs in achievement-related settings such as universities.

Therefore, this study attempts to explore the relationship between students' AGs and EC. Specifically, the aim of this study is twofold: First, it is to examine the relationship between students' AGs and EC; and second, it is to examine the role of EC as the predictor of students' AGs. Based on this aim, the following research questions were formulated: (a) what are the AGs and EC held by the students? (b) Is there any significant relationship between students' AGs and EC? And (c) does students' EC significantly predict their AGs? Relevant concepts are summarized below.

#### ***Achievement Goals***

Achievement goal theorists have described two achievement goals in particular: the goal to develop ability (variously labeled a task goal, learning goal, or mastery goal) and the goal to demonstrate ability or to avoid the demonstration of lack of ability (variously labeled an ability goal, ego goal, or performance goal) (Ames, 1992; Kaplan & Midgley, 1999; Midgley et al., 1998). However, Elliot and Church (1997)

proposed an integrative achievement goal conceptualization that includes both performance and mastery dimension as in the early form of theory, but a conventional performance goal was partitioned into an independent approach and avoidance components and three achievement goals were posited as mastery goals, performance approach-goals, and performance-avoidance goals.

Within this trichotomous framework, a mastery goal orientation is defined in terms of a focus on developing one's abilities, mastering a new skill, trying to accomplish something challenging, and trying to understand learning materials (Meece, Anderman, & Anderman, 2006). Performance-approach goals refer to an orientation towards demonstrating high ability whereas performance-avoidance goals refer to an orientation towards avoiding the demonstration of a low ability (Levy-Tossman, Kaplan, & Assor, 2007). More recently, Elliot and McGregor (2001) proposed an alternative framework comprising of four achievement goals. However, a trichotomous framework was adopted in the present study due to the reason that mastery goals, performance-approach goals, and performance-avoidance goals are the most evident goals in educational settings such as classrooms and schools (Régner, Escribe, & Dupeyrat, 2007).

A large body of research demonstrated that approach forms of AGs (i.e., mastery goals and performance-approach goals) are correlated with adaptive outcomes such as persistence and intrinsic motivation, course satisfaction, interest, and academic achievement, whereas the avoidance forms of AGs (i.e. performance-avoidance goals) are associated with maladaptive outcomes such as fear of failure, low interest, and poor academic performance (Dweck, 1986; Elliot & Church, 1997; Elliot & McGregor, 2001; Wolters, 2004; Ames & Archer, 1988; Shih, 2005; Gehlbach, 2006; Shen, Chen, & Guan, 2007). Furthermore, AGs can be adopted simultaneously in higher educational settings (i.e., colleges and/or universities) (Barron & Harackiewicz, 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Barron and Harackiewicz (2001), for example, suggested that the adoption of both a performance-approach goal and a mastery goal can be more adaptive than the adoption of either a mastery goal or a performance-approach goal in the learning process.

Recently, based on the four-phase model of interest development (Hidi & Renninger, 2006) and the multiple goals model (Harackiewicz et al., 2002), Harackiewicz, Durik, Barron, Garcia, and Tauer (2008) examined the role of AGs in the development of interest, and found that initial interest, situational interest, class performance, and AGs were significantly related to one another. Despite the fact that Harackiewicz et al.'s research was not based on the EC framework, their research pointed out that the relationship between AGs and EC is not entirely speculative.

### *Epistemic Curiosity*

The underlying cause of EC is one of the most basic problems that has occupied researchers. Loewenstein (1994, p. 93) proposed a theory through which he viewed "curiosity as occurring when an individual's informational reference point becomes elevated in a certain domain, drawing attention to an information gap" whereas

Spielberger and Starr (1994) conceptualized curiosity based on an optimal stimulation model through which it was suggested that optimal arousal is a function of both approaching new and unusual stimulation and avoiding unpleasant states of anxiety. Curiosity was defined as a feeling of deprivation (CFD) in the former whereas it was labeled as a feeling of interest (CFI) in the latter. The CFD reflects an “information gap” perspective, which can be defined by two quantities: “what one knows and what one wants or desires to know” (Loewenstein, 1994, p. 83).

According to Loewenstein (1994), such information gaps produce the feeling of deprivation-labeled curiosity. Within this view, the smaller the gap between these two quantities, the stronger one’s feeling of deprivation and thus, the higher the one’s desire to know. CFI, on the other hand, reflects an “interest” perspective, which involves positive feelings of interest associated with the anticipation of learning something new (Litman, 2005). These two perspectives on the nature of the EC are not incompatible (Litman & Jimerson, 2004). As Litman and Jimerson (2004, p. 148) explained, “Curiosity can reflect both the pleasurable anticipation of acquiring knowledge (i.e. CFI) and the feelings deprived by not having access to new information (i.e. CFD).” Therefore, EC was represented with both CFD and CFI in the present study.

Recently, Litman and Spielberger (2003) developed an Epistemic Curiosity Scale (EC-Scale), which has two factors—epistemic curiosity-diversive and epistemic curiosity-specific—which are used to assess individual differences in CFI. Epistemic curiosity-diversive assesses seeking a broad range of new information, whereas epistemic curiosity-specific measures interest in learning detailed knowledge about a specific topic. More importantly, they found that these two factors were captured by one higher-order factor, revealing that both factors of the scale can well be explained under the heading of CFI.

More recently, Litman and Jimerson (2004) developed a measurement of CFD (i.e. Curiosity as a Feeling of Deprivation Scale) (CFD-Scale) which has three factors: problem-solving, competence, and intolerance. Accordingly, the problem-solving subscale assesses problem-solving behavior motivated by feelings of tension or by a strong sense of urgency, whereas the competence subscale assesses the desire to reduce feelings of ignorance and a recognition of the value of feeling knowledgeable. The intolerance subscale, however, describes intolerance for situations in which information is inadequate. Similar to the EC-Scale, the subscales of the CFD-Scale were also captured by one higher order factor, suggesting that these factors can well be explained under the heading of CFD. Of particular interest, Litman and Jimerson also examined the relationship between CFD and CFI, and found that they are correlated significantly and positively with one another, signifying that EC could be conceptualized as involving feelings of both interest and deprivation.

Litman et al. (2005) investigated how knowledge-gaps, measured by the Feeling of Knowing, and individual differences in EC contribute to the arousal of state curiosity and exploratory behavior for undergraduate students. They found that the magnitude of perceived knowledge gaps measured by Feeling of Knowing and the EC trait both contributed to the arousal of curiosity states to motivate exploratory behavior when information was believed to be either unknown or at least partially

known. One of the interesting findings in Litman et al.'s study was that the participants wanted to check some of their answers regarding the items in general knowledge questionnaires even though they felt that they knew the answers. They concluded that such a motive may be labeled as curiosity, but it differs in its goal from the curiosity associated with a desire for intellectual enrichment, because if the answer was already known, there would be little new information to gain. According to Litman et al., this may be due to the relationship between participants' AGs and EC.

As a matter of fact, Litman (2005), in his research which, to this researcher's knowledge, is the only research on the topic, argues that CFI is highly related to scales that assess positive emotions such as mastery goals whereas CFD is somewhat more related to constructs that involve tension and anger such as performance-avoidance goals. In line with his argument, Litman (2008) recently found that CFI, as measured by the EC-Scale, was correlated with mastery-oriented learning whereas CFD, as measured by the CFD-Scale, was related to failure-avoidance and success orientation, pointing out that the students' approach and the avoidance gradient of achievement goals are rooted to EC in predicted direction.

In light of those explanations above, it was hypothesized that CFD will correlate with the avoidance form of AGs (i.e., performance-avoidance goals), whereas CFI will correlate with mastery goals. No specific hypothesis was suggested regarding the relationships among performance-approach goals, CFD, and CFI, due to the mixed findings about the adaptive role of performance-approach goals (Midgley, Kaplan, & Middleton, 2001).

## Method

### *Participants*

Based on the survey method, a total of 309 undergraduate students (159 females, 150 males), who majored in Business Administration ( $n = 129$ ), Physics ( $n = 82$ ), and Psychological Counseling and Guidance ( $n = 98$ ) in a large university which is located in the northwest of the Black Sea Region in Turkey, voluntarily participated in the study. Students were recruited from the three domains which were randomly selected among the departments of the three large faculties of the university where the present study was carried out (i.e., faculty of education-approximately 4574 students, faculty of science and letters-approximately 1000 students, and faculty of management and business administration-approximately 2292 student). Of these 309 students, thirty-three were freshmen, ninety-seven were sophomores, eighty-four were juniors and ninety-five were seniors. Participants ranged in age from 17 to 33 years ( $M = 21.21$ ,  $SD = 1.83$ ). In Turkey, the cost of university education is relatively high for undergraduate students. Therefore, it was assumed that the level of the sample students' socio-economic status was at least medium.

### *Research Instruments*

All items in the research instruments were translated into Turkish by the researcher with the assistance of three lecturers in the foreign languages department

of the university where the present study was carried out. Specifically, items were translated into Turkish by the researcher first, and then the lecturers translated them back into English. Finally, the original items were compared to those that were translated. Overall, the agreement rate on the items of the scales was quite high (88%). Disagreements were resolved through discussion of the items.

***Epistemic Curiosity Scale.*** Because it has been widely used in curiosity research, the EC-Scale (Litman & Spielberger, 2003) was used to assess students' CFI in the present study. The EC-Scale is a 10-item scale that has two factors as epistemic curiosity-diversive (e.g., I enjoy learning about subjects which are unfamiliar) and epistemic curiosity-specific (e.g., I'm interested in discovering how things work). The EC-Scale measures CFI, namely, positive feelings of interest in gaining intellectual knowledge (Litman & Pezzo, 2007). As in the original scale, participants were asked to report how they generally felt on a 4-point Likert-type scale, ranging from 1 (almost never) to 4 (almost always). The internal reliability of the scale was .80 in the present study.

***Curiosity as a Feeling of Deprivation Scale.*** The CFD-Scale (Litman & Jimerson, 2004) was used in the present study to assess students' feelings of uncertainty and tension that motivated students' information-seeking and problem-solving behavior. As mentioned earlier, CFD-Scale is a 15-item scale that has three factors in problem-solving (e.g., conceptual problems keep me awake thinking about solutions), competence (e.g., important to feel knowledgeable) and intolerance (e.g., critical of ideas and theories). Although the CFD-Scale and EC-Scale shared the same focus on desire to obtain intellectual knowledge, the former emphasizes acquiring knowledge in order to reduce feelings of tension due to uncertainty (Litman & Pezzo, 2007). The CFD-Scale also has a 4-point response format, ranging from 1 (almost never) to 4 (almost always). Cronbach's coefficient alpha was .85 in the present study.

Despite the fact that the CFD-Scale has three factors and EC-Scale has two factors, these factors are yielded to higher-order factors such as CFD and EC respectively, suggesting that the scales can also be used based on their higher-order factors. Thus, regardless of their respective factors, the sum of the item scores in both the CFD-Scale and the EC-Scale were considered in order to focus on their core aspects (i.e., feelings of interest and deprivation). As a result, the confirmatory factor analysis<sup>1</sup> showed that both one-factor CFD-Scale with 15 indicators (GFI = .95; AGFI = .94; CFI = .95) and one-factor EC-Scale with 10 indicators (GFI = .94; AGFI = .91; CFI = .91) has an acceptable fit to the data (Bollen & Curran, 2006).

***Achievement Goal Questionnaire.*** The Achievement Goal Questionnaire (AG-Questionnaire) (Elliot & McGregor, 2001) was used to assess students' AGs in this study. The scale is comprised of mastery-approach, mastery-avoidance performance-approach, and performance-avoidance goal dimensions, each of which has three items. However, in accordance with the trichotomous framework, mastery-approach (hereafter mastery goals), performance-approach, and performance-avoidance goal dimensions of the scale were considered in the present study.

<sup>1</sup> Because the data were somewhat skewed, the Maximum Likelihood Estimation method (MLE) was not used; the Ordinary Least Squares method (OLS) from STATISTICA 7 was used in all the CFA analyses (Bollen & Curran, 2006).

As in the original scale, items were presented in a 7-point Likert scale format, ranging from 1 (not at all true of me) to 7 (very true of me). The internal reliabilities were .93, .84, and .77 for performance-approach goals, mastery goals, and performance-avoidance goals respectively.

However, it was observed that the reliability coefficient for the performance-avoidance scale would have improved to .89 if one of the items had been deleted (e.g., my fear of performing poorly in this class is often what motivates me). Therefore, performance-avoidance goal dimension was represented with two items. Finally, the confirmatory factor analysis showed that the three-factor model had a good fit to data (GFI = .99; AGFI = .98; CFI = .99).

### **Procedure**

Data were obtained during the fall semester of the 2007-2008 academic year. The scales were applied with an interval of a few days in order to prevent a possible response bias. Students were asked to write a pseudonym on each scale in order to make sure that the scales are applied to each participant in the sample. Based on a match/mismatch procedure, only those students whose pseudonyms consistently appear on each of the scales were included in the sample of the study (n = 309) whereas the remaining students were excluded (n = 18). Furthermore, these scales were presented to participants with instructions concerning both the aim of the study and a brief explanation about the constructs. Gender, age, and year of study were assessed by a self-report on each of the scales. Administration lasted approximately 10-15 minutes for the EC-Scale, 15-20 minutes for the CFD-Scale, and 10-15 minutes for the AG-Questionnaire.

### **Data Analyses**

Data were analyzed by SPSS 15.0 and STATISTICA 7 software. As preliminary analysis, the interactions among background variables (i.e., gender, age, year of study, and fields of study), CFD, and CFI were checked due to the possibility that the interactional effects of these variables on dependents may cause an artificial decrease or increase in the predictive power of independents. Therefore, a Multivariate Analysis of Covariance (MANCOVA) was conducted (Stevens, 1996). In the MANCOVA, AGs were entered as dependents and age as a covariate whereas gender, year of study, and fields of study were entered as independents. Following the MANCOVA, a series of Univariate Analysis of Variance (ANOVA) was also conducted. However, no significant interactions among the background variables, CFD, and CFI were detected. It can be said that, at least in the present sample, the possible effects of CFD and CFI on dependents would not be artificial and would not originate from the hidden effects of those relationships among background variables, CFD, and CFI. Thus, the interactional effects were not included in the analysis. Nevertheless, background variables were included in the analysis in order to control their direct effects on dependents. Indeed, these variables are frequently controlled in

educational research in order to obtain more robust and reliable results regarding the variables at hand (Stevens, 1996).

Utilizing a series of one-sample t-tests, students' CFD, CFI, and AGs were defined. Midpoints of the rating scales were 4 for Achievement Goal Questionnaire, and 2.5 for both curiosity scales. These midpoints were taken as reference points to compare the group means of each dimension of the scales. Addressing the second research question, both zero-order correlation (Pearson) and hierarchical regression analyses were conducted. Gender (females equal to 1 and males equal to 0), age (reported as open-ended), year of study, and fields of study variables were all entered in the first step of the regression analyses in order to control their possible effects on dependents (i.e. achievement goals). A traditional coding procedure was utilized for years of study and fields of study variables (Pedhazur, 1997). Accordingly, seniors were determined as an outer category for year of study, whereas Psychological Counseling and Guidance was the external category for fields of study. Thus, the remaining categories in fields of study and year of study were all compared to respective outer categories. Finally, CFI was entered in the second step of the analyses whereas CFD was entered in the final step of the analyses in order to see their main effects on dependents separately.

## Results

### *Descriptive Analysis*

The results of the one-sample t-tests were summarized in Table 1.

**Table 1**  
*Summary of the One-Sample t-Test Results*

Variable	M (SD)	t	p
CFD	44.24 (6.91)	17.15	.000
CFI	28.69 (5.25)	12.35	.000
MAS	16.77 (3.18)	26.35	.000
PAP	13.94 (4.16)	8.17	.000
PAV	7.24 (3.30)	-4.05	.000

*Note.* CFD: Curiosity as a Feeling of Deprivation;  
CFI: Curiosity as a Feeling of Interest; MAS:  
Mastery Goals; PAP: Performance-Approach Goals;  
PAV: Performance-Avoidance Goals.

As seen in Table 1, both means of CFD ( $t(308) = 17.15, p < .001$ ) and CFI ( $t(308) = 12.35, p < .001$ ) were significantly above the midpoint, indicating that both roots of the epistemic curiosity of sample students were at relatively high levels. Students' mastery goals ( $t(308) = 26.35, p < .001$ ) and performance-approach goals ( $t(308) = 8.17, p < .001$ ) were also significantly above the midpoint. However, the same was not true for students' performance-avoidance goals ( $t(308) = -4.05, p < .001$ ).



### Correlation Analysis

The results of the correlation analysis were presented in Table 2.

**Table 2**  
*Bivariate Correlations*

Variable	1	2	3	4	5
1. CFD	-				
2. CFI	.44**	-			
3. MAS	.27**	.20**	-		
4. PAP	.13*	.09	.16*	-	
5. PAV	-.12*	-.10	-.28**	-.09	-

\*\*p<.01; \*p<.05

As shown in Table 2, CFD was positively and moderately correlated with mastery goals ( $r = .27$ ,  $p < .01$ ) whereas it was positively and weakly correlated with performance-approach goals ( $r = .13$ ,  $p < .05$ ). In addition, the relationship between the performance-avoidance goals and CFD was weak and negative ( $r = -.12$ ,  $p < .05$ ). CFI, on the other hand, correlated only with mastery goals ( $r = .20$ ,  $p < .01$ ). CFD and CFI strongly and positively correlated with one another ( $r = .44$ ,  $p < .01$ ). Mastery goals weakly and positively correlated with performance-approach goals ( $r = .16$ ,  $p < .05$ ), but moderately and negatively correlated with performance-avoidance goals ( $r = -.28$ ,  $p < .01$ ). Finally, no significant relationship was observed between the performance-approach and performance-avoidance goals ( $r = -.09$ ,  $p > .05$ ).

### Hierarchical Regression Analysis

The summary of the regression results was presented in Table 3. Regardless of the effects of background variables (see Table 3), the second step of the analyses revealed that the CFI significantly predicted the students' mastery goals ( $\beta = .19$ ,  $p < .01$ ). However, in the third step, the effect of the CFI disappeared due to the CFD effects on mastery goals ( $\beta = .23$ ,  $p < .001$ ). Additionally, the CFD also predicted students' performance-approach goals ( $\beta = .13$ ,  $p < .05$ ). Finally, neither CFD nor CFI predicted students' performance-avoidance goals whereas the approach forms of AGs were significantly linked to students' CFD and CFI (see Table 3).

## Discussion

The descriptive results of the study showed that both students' CFD and CFI were at relatively high levels. Given that the EC reflects a desire for new information that motivates knowledge acquisition/exploratory behavior (Litman et al., 2005), and such behaviors are usually reinforced in the university where the epistemic aspect of the curiosity is more salient, they explain why sample students' EC were at relatively high levels. The t-test results, on the other hand, revealed that both performance-approach

**Table 3**  
**The Summary of the Hierarchical Regression Results**

Variable	MAS				PAP				PAV			
	B	S. E.	$\beta$	p	B	S. E.	$\beta$	p	B	S. E.	$\beta$	p
Step 1												
Age	-.05	.14	-.03	.732	-.30	.18	-.13	.086	.25	.14	.14	.068
Gender	.69	.37	.11	.063	.33	.47	.04	.481	.01	.37	.00	.986
Freshmen	.02	.91	.00	.979	-1.43	1.17	-.11	.222	1.83	.91	.17	.046*
Sophomores	-.32	.58	-.05	.587	-.92	.75	-.10	.221	1.22	.59	.17	.039*
Juniors	.48	.55	.07	.384	.33	.71	.04	.645	-.04	.55	-.01	.940
Business	.27	.46	.04	.559	2.44	.59	.29	.000***	1.77	.46	.27	.000***
Physics	1.38	.61	.19	.024*	1.84	.79	.20	.020*	-.89	.61	-.12	.147
Step 2												
Age	-.05	.13	-.03	.686	-.31	.18	-.13	.081	.25	.14	.14	.063
Gender	.74	.36	.12	.040*	.37	.47	.04	.436	-.02	.37	-.00	.948
Freshmen	-.14	.89	-.01	.875	-1.52	1.17	-.11	.192	1.91	.91	.18	.037*
Sophomores	-.33	.57	-.05	.571	-.92	.75	-.10	.218	1.22	.58	.17	.037*
Juniors	.31	.54	.04	.566	.23	.71	.02	.749	.05	.55	.01	.935
Business	.30	.45	.05	.506	2.46	.59	.29	.000***	1.75	.46	.26	.000***
Physics	1.33	.60	.19	.028*	1.81	.78	.19	.021*	-.87	.61	-.12	.159
CFI	.12	.03	.19	.001**	.07	.04	.09	.121	-.06	.04	-.10	.086
Step 3												
Age	-.10	.13	-.06	.443	-.34	.18	-.15	.051	.27	.14	.15	.048*
Gender	.47	.36	.07	.196	.16	.48	.02	.742	.09	.38	.01	.837
Freshmen	-.34	.88	-.03	.699	-1.68	1.16	-.13	.150	1.98	.91	.19	.030*
Sophomores	-.39	.56	-.06	.491	-.97	.74	-.11	.193	1.24	.58	.18	.034*
Juniors	.27	.53	.04	.611	.20	.70	.02	.782	.06	.55	.01	.913
Business	.45	.44	.07	.312	2.57	.58	.31	.000**	1.70	.46	.25	.000***
Physics	1.52	.59	.21	.011*	1.96	.78	.21	.013*	-.93	.61	-.13	.129
CFI	.05	.04	.09	.147	.02	.05	.03	.661	-.04	.04	-.06	.343
CFD	.10	.03	.23	.000***	.08	.04	.13	.038*	-.04	.03	-.08	.200

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

Note. MAS:  $R^2 = .04$ ,  $F(7, 301) = 1.84$ ,  $p > .05$  for step 1;  $R^2 = .08$ ,  $F(8, 300) = 3.13$ ,  $p < .01$  for step 2;  $R^2 = .12$ ,  $F(9, 299) = 4.34$ ,  $p < .001$  for step 3. PAP:  $R^2 = .08$ ,  $F(7, 301) = 3.52$ ,  $p < .01$  for step 1;  $R^2 = .08$ ,  $F(8, 300) = 3.40$ ,  $p < .01$  for step 2;  $R^2 = .10$ ,  $F(9, 299) = 3.54$ ,  $p < .001$  for step 3. PAV:  $R^2 = .10$ ,  $F(7, 301) = 4.89$ ,  $p < .001$  for step 1;  $R^2 = .11$ ,  $F(8, 300) = 4.67$ ,  $p < .001$  for step 2;  $R^2 = .12$ ,  $F(9, 299) = 4.34$ ,  $p < .001$  for step 3.

goals and mastery goals were highly pursued by the students. However, the opposite was the case for students' performance-avoidance goals. This result is in accordance with the multiple-goal framework in which both performance-approach goals and mastery goals were adopted simultaneously (Barron & Harackiewicz, 2001). In fact, the results of the correlation analysis supported this claim. In other words, correlation analysis provided a significant framework in which CFD, as compared to CFI, was the dominant EC dimension that associated with students' AGs, suggesting that a multiple goal framework was the case for the sample students.

The results of the regression analysis, on the other hand, showed that it wasn't CFI, but CFD that significantly predicted students' AGs. More specifically, regardless of the effects of the background variables, CFD significantly predicted both students' mastery goals and performance-approach goals, indicating that students' mastery goals, as well as their performance-approach goals, were significantly affected by their CFD. This result is not in accordance with Litman's (2008) study. Given the fact that mastery goal-oriented students focus on learning for its own sake in achievement settings, one may intuitively expect that CFI, as a curiosity motive, is more reasonable or is at least more appropriate for mastery-goal-oriented students than CFD. However, according to Loewenstein (1994) "filling information gap is an important aspect of achieving competence, and curiosity is certainly and particularly strong when it comes to knowledge pertaining to one's own competence" (Loewenstein, 1994, p. 93). Loewenstein (1994) also suggested that CFD is a more powerful motive for learning than CFI. If this is the case, one can understand why students' mastery goals are CFD-driven. Mastery goal-oriented students are more interested in gaining knowledge and seeking information (Elliot, 1999). This makes them relatively well-informed about the tasks at hand. As demonstrated in the previous studies, the more a person approaches an answer, the more s/he wants to know the answer due to the reduction of tension attributed to uncertainty (Litman, 2005; 2008).

The same reasoning may be used to explain why CFD underlies the students' performance-approach goals because information sought during CFD reactions is theorized to be substantive, meaningful, and capable of increasing subjective feelings of competence such as solutions to a difficult problem (Litman, 2005), which is a desirable outcome for demonstrating the ability to others. Nevertheless, cultural background variables such as individualism and collectivism (e.g. Nisbett, 2005), which were not considered in the present study, may also have played a significant role in the emergence of different pictures regarding the links among Turkish undergraduate students' CFD, CFI, and AGs and those of their American peers. This issue deserves further investigation.

Following those explanations above, it can be said that both students' mastery goals and performance-approach goals were affected by CFD regardless of the focus of their AGs (e.g., performing better than the others or task mastery), indicating that not the focus, but the approach gradient is the case. As a matter of fact, CFD, like CFI, did not significantly predict students' performance-avoidance goals which lie on the avoidance gradient of AGs. In short, it seems that the mastery goal-oriented and performance-approach goal-oriented students' EC points more to CFD than to CFI. This result has broadened our current view about the curiosity motives underlying the students' mastery goals and performance-approach goals. Accordingly, CFD seems to be more important

than CFI in achievement goal-related settings such as university. Therefore, it can be said that considering CFD as a significant antecedent of students' mastery goals and performance-approach goals requires designing a learning environment in which students act as autonomous learners to fill the gaps between what they know and what they desire to know in order to take advantage of their mastery goals and performance-approach goals. Results also showed that CFD and CFI are strongly correlated with one another. This relationship may indicate a co-activation or interplay between them in achievement goal-related settings; this idea needs further investigation.

#### *Limitations*

This study has several limitations. First, the sample size was relatively small which limited the generalizability of the current results. Second, the data were correlational in nature, indicating that the results of this study could not be interpreted in a causative manner. Third, the participants' performance-avoidance goals were assessed only with two items. Although the performance-avoidance goal scale with two items had high internal reliability, this can also be seen as a limitation due to the small number of items in the scale. Finally, obtaining the data from only one university was another limitation of the study. Therefore, the results of this study should be cautiously interpreted in future research.

### **Conclusions and Recommendations**

The present study revealed that (a) both students' CFD and CFI are at relatively high levels, suggesting that both dimensions of EC are highly represented in educational settings such as university; (b) students tend to adopt both performance-approach goals and mastery goals compared to performance-avoidance goals, signifying that it is more appropriate to focus on students' AGs within a multiple-goal framework, which is also replicated through the results of the correlation analysis; (c) the sample students' EC, especially in CFD form, is correlated with their mastery goals and performance-approach goals, pointing out that CFD is a significant antecedent of students' mastery goals and performance-approach goals.

Based on the results of this study, it can be suggested that (a) the epistemic nature of the students' curiosity should be considered both in educational settings such as university and in future research to broaden our current understanding with respect to the antecedents of AGs, as well as to broaden our viewpoint regarding the effects of learning environments on students' EC and AGs which have long been valued, but separately emphasized to date; and (b) not only the interest type of students' EC, but also the deprivation type, which seems more effective on students' achievement motivation, should be emphasized in order to activate and/or sustain curiosity in educational settings, which, in turn, may enhance students' mastery goals and performance-approach goals.

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## Bilgi Kaynaklı Merak ve Başarı Amaçları Arasındaki İlişkinin İncelenmesi

### (Özet)

*Problem Durumu:* Konuyla ilgili literatürde, bilgi kaynaklı merak ve başarı amaçları arasındaki ilişkiye yönelik çıkarsamaların yapıldığı bazı araştırmalar bulunmasına rağmen, konunun doğrudan incelendiği yalnızca bir araştırmaya rastlanmıştır. Ancak, hem başarı amaçları hem de bilgi kaynaklı merak konusunun iyi bilinen önemi dikkate alındığında, bu değişkenler arasındaki ilişkiye yönelik bir çalışmanın üniversiteler gibi başarı-amaçlarının önemli bir etken olduğu eğitim/öğretim ortamlarında öğrencilerin başarı amaçlarının bilgi kaynaklı merakla ilgili kökenlerinin keşfedilmesi açısından önemli olduğu söylenebilir. Dolayısıyla, bu çalışma söz konusu iki değişken arasında bugüne kadar ihmal edilmiş boşluğu doldurabilmek için “öğrencilerin başarı amaçları ve bilgi kaynaklı merakları nedir?”, “Öğrencilerin başarı amaçları ve bilgi kaynaklı merakları arasında anlamlı bir ilişki var mıdır?” Ve “öğrencilerin bilgi kaynaklı merakları başarı amaçlarını anlamlı düzeyde yordamakta mıdır?” sorularına odaklanmıştır.

*Araştırmanın Amacı:* Bu araştırmanın amacı iki yönlüdür: Birincisi, öğrencilerin başarı amaçları ve bilgi kaynaklı merakları arasındaki ilişkinin incelenmesi, ikincisi ise bilgi kaynaklı merakın öğrencilerin başarı amaçlarındaki rolünün incelenmesidir.

*Araştırmanın Yöntemi:* Tarama yönteminden hareketle, Türkiye'nin Batı Karadeniz bölgesinde yer alan büyük bir üniversitenin işletme (n = 129), fizik (n = 82) ve psikolojik danışma ve rehberlik alanlarında (n = 98) öğrenim gören toplam 309 öğrenci (159 kız, 150 erkek) çalışmaya gönüllü olarak katılmıştır. Örneklemde yer alan öğrencilerin, sırasıyla, 33'ü 1. sınıflarda, 97'si ikinci sınıflarda, 84'ü üçüncü sınıflarda ve 95'i 4. sınıflarda öğrenim görmektedir. Örneklemde yer alan öğrencilerin yaşları 17 ile 33 arasında değişmektedir. Buna göre, öğrencilerin yaş ortalaması 21.21 standart sapması ise 1.83 olarak hesaplanmıştır. Öğrencilerin ilgi hissi olarak meraklarını ölçmek için Bilgi Kaynaklı Merak Ölçeği, yoksunluk hissi olarak meraklarının ve problem çözme ve enformasyonu arama davranışlarını motive eden gerilimin ölçülmesi içinse Yoksunluk Hissi Olarak Merak Ölçeği kullanılmıştır. Öğrencilerin başarı amaçlarına ilişkin veriler ise Başarı Amaçları Anketi aracılığıyla elde edilmiştir. Araştırmada kullanılan tüm ölçme araçları araştırmacı tarafından Türkçe'ye çevrilmiş ve Yabancı Diller alanından iki uzmanın yardımı aracılığıyla da tekrar-çeviri yöntemi uygulanmıştır. Ölçekler öğrencilere araştırmanın amacını ve maddelere ilişkin görüşlerin nasıl belirtileceğine ilişkin açıklamaları içeren birer yönergeyle verilmiştir. Ölçeklerin uygulanması esnasında öğrencilerden gelen sorular yanıtlanmıştır. Verilerin çözümlenmesinde tek örneklem t-testleri, korelasyon ve hiyerarşik regresyon analizleri kullanılmıştır.

*Araştırmanın Bulguları:* Araştırmada tek örneklem t-testi aracılığıyla elde edilen betimsel bulgular, öğrencilerin hem yoksunluk hem de ilgi hissi olarak merak düzeylerinin görece yüksek düzeylerde olduğunu göstermiştir. Öğrencilerin üniversitede öğrenim gören öğrenciler olduğu ve üniversite öğrenim sürecinin de merak düzeyini canlı tutan eğitimsel/öğretimsel uygulamalar içerdiği

dikkate alındığında, öğrencilerin bilgi kaynaklı merak düzeylerinin görece yüksek değerlerde olmasının beklenen bir bulgu olduğu söylenebilir. Bununla birlikte, tek örneklem t-testi sonuçları öğrencilerin performanstan kaçınma amaçlarından çok, performansa yaklaşma ve ustalaşma amaçlarını kabul etme eğilimlerinin yüksek olduğuna işaret etmektedir. Araştırmanın bu bulgusu, hakkında gittikçe artan miktarda kanıtın elde edildiği çoklu amaç çerçevesi ile uyumlu bir bulgudur. Nitekim tek örneklem t-testi aracılığıyla elde edilen bu bulgu, korelasyon analizi aracılığıyla elde edilen bulgularla da desteklenmiştir. Buna göre, korelasyon analizi sonuçları ilgi hissi olarak meraka göre yoksunluk hissi olarak merakın, öğrencilerin başarı amaçlarıyla anlamlı ve görece daha yüksek düzeyde ilişkili olduğunu gösteren anlamlı bir çerçeve sağlamıştır. Beklentinin aksine, hiyerarşik regresyon analizi sonuçları ilgi hissi olarak merakın değil, yoksunluk hissi olarak merakın öğrencilerin başarı amaçlarını yordamakta olduğunu göstermiştir. Daha açık bir ifadeyle, yoksunluk hissi olarak merak, ustalaşma ve performansa-yaklaşma amaçlarının yoksunluk hissi olarak merak güdümlü olduğunu gösterecek şekilde, öğrencilerin ustalaşma ve performansa-yaklaşma amaçlarını anlamlı düzeyde ve arka plan değişkenlerinin (yaş, cinsiyet, program türü) etkisinden bağımsız olarak yordamıştır. Araştırmadan elde edilen bulgular doğrultusunda eğitimsel çıkarsamalar ve gelecekte yapılabilecek araştırmalar üzerinde de durulmuştur.

Ancak, araştırmanın bulgularının görece küçük bir örneklem üzerinden ve tek bir üniversiteden elde edilmiş olması genellenebilirliklerini sınırlamaktadır. Bununla birlikte, araştırmanın kesitsel olması ve verilerin korelasyonel yöntemlerle incelenmesi, elde edilen bulguların nedensel bir biçimde yorumlanmasına olanak vermemektedir. Dolayısıyla, bu çalışmadan elde edilen bulgular gelecekte yapılacak olan araştırmalarda dikkatle yorumlanmalıdır.

*Araştırmanın Sonuçları ve Önerileri:* Sonuç olarak bu çalışma üniversite öğrencilerinin hem yoksunluk hissi olarak merak hem de ilgi hissi olarak merak düzeylerinin görece yüksek olduğunu göstermiştir. Bununla birlikte, çalışmadan elde edilen bulgular başarı amaçlarının çoklu amaç çerçevesi içerisinde ele alınmasının daha uygun bir yaklaşım olduğuna işaret edecek şekilde, öğrencilerin performanstan-kaçınma amaçlarından çok, hem performansa yaklaşma hem de ustalaşma amaçlarını benimseme eğiliminde olduklarını ortaya koymuştur. Son olarak, çalışmanın sonuçları bir yoksunluk hissi olarak merakın öğrencilerin hem ustalaşma hem de performansa-yaklaşma amaçlarının anlamlı bir yordayıcısı olduğunu göstermiştir. Söz konusu sonuçlar ışığında, öğrencilerin bilgi kaynaklı merak düzeylerinin gerek eğitim ortamlarında gerekse gelecekte yapılacak olan araştırmalarda dikkate alınmasının önemli doğurguları olacağı söylenebilir. Gelecekte farklı yaklaşımlarla ve daha büyük örneklemler aracılığıyla gerçekleştirilecek araştırmalar motivasyon ve bilgi kaynaklı merak konularına ilişkin olarak eğitim bilimsel anlamda önemli katkılar sağlayabilirler.

*Anahtar Sözcükler:* Bilgi kaynaklı merak, başarı amaçları, üniversite öğrencileri, hiyerarşik regresyon analizi