Profiling Differences in Achievement and Social Goals of Students at Different Levels of Expertise

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ABSTRACT

The purpose of this study was to integrate domain-learning theory and goal theory to investigate the learning processes, achievement goals, social goals, and achievement of 141 college students. Cluster-analytic procedures were used to categorize participants at different levels of expertise based on their responses on knowledge, interest, and strategic processing measures specific to psychology. Results revealed two distinct levels of expertise: Acclimated and Competent. Three sets of findings enhance our understanding of college learning. First, results indicated students at different levels of expertise adopt different goals. Whereas, the Acclimated group adopted performance-avoidance goals, the Competent group adopted mastery, performance-approach, and social concern goals, indicating students at different levels of expertise have different reasons for achieving. Second, the results provide support for multiple goal theory: (a) interest, strategic processing, and psychology GPA were each positively correlated with mastery and performance-approach goals; and (b) mastery and performance-approach goals were each unique predictors of psychology GPA. Third, social goals were positively related to some academic outcomes and negatively related to others. Findings suggest that college students' goals relate to the development of expertise within a domain. Educators need to consider students' knowledge, interest, strategy use, and goal orientations when developing instructional environments to improve student learning. (Contains 1 figure and 2 tables)

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Despite steady increases in college enrollment, approximately 25% of students who enter four-year colleges fail to earn a degree (NCES, 2004). There are many reasons why students leave college, including low academic achievement and difficulty adjusting to college (Tinto, 1993). A large body of research has substantiated how factors such as strategic processing, interest, knowledge, and achievement goals relate to academic achievement (Pintrich & Schunk, 2002) and how students' learning processes change as they develop expertise (Alexander & Murphy, 1998). However, research has not explored the goals of college students at different levels of expertise, which may provide valuable insight into college learning and success. Therefore, this study integrated domain-learning theory and goal theory to examine the goals and academic achievement of college students at different levels of expertise.

One perspective used in this study to explore college learning was achievement goal theory, also commonly referred to as goal theory, which asserts that student behaviors are a function of desires to achieve in academic settings and that students have different reasons for achieving (Pintrich & Schunk, 2002). Although theoretical conceptualizations and labels differ, a widely accepted model is the three-factor model (Elliot, 1997) composed of mastery goals (focused on development of competence), performance-approach goals (focused on attainment of competence relative to others), and performance-avoidance goals (focused on avoidance of incompetence relative to others).

Mastery goals are related to an array of adaptive outcomes, including higher levels of interest, use of metacognitive strategies, task value, and academic performance (e.g., Harackiewicz, Barron, & Elliot, 1998). However, research on performance goals and their

relation to strategy use and achievement is less conclusive, with some studies finding positive relations between performance goals and strategy use and others finding no relation (Harackiewicz et al.). Other research has indicated that students who adopt performance-approach goals demonstrated higher levels of achievement than students who adopted mastery goals (Barron, Harackiewicz, & Tauer, 2001). Finally, research is inconclusive as to whether the adoption of a single goal or a combination of goals is more adaptive (e.g., Barron & Harackiewicz, 2001).

The adoption of more than one achievement goal is often referred to as the multiple goal perspective. Research indicates that individuals can simultaneously have varying degrees of both mastery and performance goals (Harackiewicz et al., 1998; Meece & Holt, 1993). More precisely, research suggests it is the combination of mastery and performance-approach goals that promotes optimal outcomes. Barron and Harackiewicz (2001) have suggested four potential relational patterns between mastery and performance-approach goals. The *additive goal pattern* proposes that mastery and performance-approach goals can have independent positive main effects on the same outcomes. The *interactive goal pattern* proposes that, regardless of their interactive effects, mastery and performance-approach goals can interact, such that students who are high on both goals are advantaged for some academic outcome. The *specialized goal pattern* proposes that mastery and performance-approach goals have specialized effects on different outcomes. The *selective goal pattern* proposes that students actively select which type of goal to adopt, depending on the situation. However, because limited research has tested the independent and interactive effects of multiple goals, Barron and Harackiewicz recommend that researchers utilize analytic techniques that allow for the possibility of multiple goal effects, such as multiple regression and cluster analysis.

Although contemporary achievement motivation researchers focus on achievement goals, the original conceptualization of achievement goal theory included both achievement goals and social goals (Blumenfeld, 1992). Whereas achievement goals reflect students' academic reasons for trying to achieve in an academic setting (Elliot, 1997), social goals reflect students' nonacademic reasons for engaging in academic tasks (Urdan & Maehr, 1995). Research has demonstrated that achievement goals and social goals are conceptually distinct constructs despite both being related to achievement outcomes (Dowson & McInerney, 2001). However, social goals are not as extensively researched as achievement goals, despite some research with elementary and high school students suggesting students may pursue a combination of achievement goals and social goals (Dowson & McInerney, 2004). No studies to date have simultaneously examined achievement and social goals at the college level.

Researchers have used both variable-centered approaches and person-centered approaches to investigate goal profiles. Whereas the purpose of a variable-centered approach is to examine the effects of a variable on an outcome, the purpose of a person-centered approach is to understand the complex processes that characterize an individual (Pastor, Barron, Miller, & Davis, 2007). Hence, the present study used a person-centered approach to examine students' goal profiles.

Another perspective used in this study to investigate college learning was domain-learning theory, which focuses on the changes in the learning process during the development of expertise (Alexander, 2000). The Model of Domain Learning, or MDL, represents the development of expertise as a three-stage process: acclimation, competency, and expertise (Alexander, 2003). At each stage, there is the interplay of three components: knowledge, interest,

and strategic processing. According to the MDL, expertise embodies specialized knowledge, effective and efficient strategy use, and a general preference for domain-specific content and activities. Whereas acclimated learners demonstrate low levels of knowledge, interest, and strategy, competent learners demonstrate increased interest, knowledge, and the ability to use a mix of learning strategies. Proficient learners display high individual interest and extensive and highly integrated knowledge. Such learners are able to effectively and efficiently select and use strategies consistent with goals and task demands.

Although research demonstrates that students' goals are related to each of the components of the MDL (Dweck & Leggett, 1988; Elliot & Church, 1997; Barron & Harackiewicz, 2001), research has not yet investigated the goals of students at different levels of expertise. Moreover, few studies using the framework of the MDL have examined the relation between levels of expertise and academic achievement, with Alexander and Murphy (1998) being a notable exception. Given that students strive for achievement for a variety of reasons and that students are likely to adopt more than one goal, the examination of goal profiles including both achievement goals and social goals may provide insight into ways to enrich learning and improve instruction at the college level. Therefore, to better understand the relations among goals, achievement, and levels of expertise, this study addressed four questions:

1. What are the achievement and social goals adopted by students at different levels of expertise?

2. Do students at different levels of expertise differ in academic achievement?

3. How do the components of the MDL relate to achievement and social goals?

4. Do multiple goals predict academic achievement?

Method

Participants

The 141 participants (100 females, 41 males, mean age = 20.5 years, *SD* = 1.69 years) were enrolled in psychology courses at a mid-sized northeastern university. In exchange for their participation, students selected one $5 gift card to Starbucks, Starbucks, or Barnes & Noble.

Measures

Domain knowledge. Domain knowledge, the breadth of one's knowledge of psychology, was assessed using a measure developed by the principal investigator and was modeled after research studies using the framework of the MDL to assess students' domain knowledge (e.g., Alexander et al., 2004). Items for the test were selected from domain-specific course material and were each worth one point. The coefficient alpha for the 25-item measure was .78.

Interest. A scale was developed to assess students' level of interest in psychology as reflected by perceptions of enjoyment, importance, and usefulness of the course and its content using items from the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich, Smith, Garcia, & McKeachie, 1991) and Harackiewicz and colleagues' (2000) measure. The scale was comprised of 15 items rated on a 7-point scale, from 1 (strongly disagree) to 7 (strongly agree). The interest score was the mean of the ratings of the 15 items. The coefficient alpha of the interest measure used in the present study was .92.

Strategic processing. Strategic processing was measured using the rehearsal, elaboration, organization, and metacognitive self-regulation subscales from the MSLQ (Pintrich et al., 1991): A separate score was computed for the total measure and each of the subscales by summing the ratings given to each of the items and dividing by the total number of items. Items were rated on

a 7-point scale, from 1 (not at all true for me) to 7 (very true for me). Internal consistency for the total scale was .84.

Achievement goal orientation. The Achievement Goal Orientation Questionnaire (Elliot & Church, 1997) was used to assess college students' self-reported adoption of mastery, performance-approach, and performance-avoidance goals. The measure contained 18 items with each subscale containing six items. Each item was scored on a 7-point scale, from 1 (not at all true for me) to 7 (very true for me). Achievement goal scores were calculated by summing the ratings given to each subscale's items and dividing by the six items. The total scales achieved a coefficient alpha of .76.

Social goal orientation. Social goal orientation was assessed using three of the five subscales from the social goal scale of the Goal Orientation and Learning Strategies Survey (GOALS-S; Dowson & McInerney, 2004): social approval (desire to achieve in order to gain approval of others), social concern (desire to achieve academically to be able to assist others in achieving), and social responsibility (desire to achieve to maintain interpersonal commitments). The measure contained 18 items with each subscale containing six items. Each item was rated on a 5-point scale, from 1 (strongly disagree) to 5 (strongly agree). Social goal scores were the mean of the six ratings given to subscale items. The coefficient alpha for the full scale was .90.

Academic achievement. Academic achievement was measured using psychology GPA.

Coding

A person-centered approach was used to classify students into levels of expertise. First, hierarchical cluster analysis was used to arrange participants into groups by categorizing their responses to the domain knowledge, interest, and strategic processing measures. Ward's method of linkage and squared Euclidean distance was used as a measure of similarity. An examination

of the agglomeration schedule, dendrogram, and cluster sizes for each solution indicated that a two-cluster solution provided the most interpretable pattern and maximized both the homogeneity of cases within clusters and the heterogeneity of cases between clusters.

A MANOVA was conducted to examine differences in clustering variables among the groups to validate cluster solutions. Results indicated significant overall differences between the groups. Cluster 1 was comprised of forty-three (30.5%) students and cluster 2 was comprised of 98 (68.5%) students. Based on the mean differences of study variables (Table 1) and in accordance with MDL theory, cluster 1 was labeled the Acclimated group and cluster 2 was labeled the Competent group.

A discriminant function analysis (DFA) was conducted to further verify the uniqueness of the Competent group and the Acclimated group. DFA is commonly used to determine whether group membership can be reliably predicted from a set of variables (Tabachnick & Fidell, 2001). Domain knowledge, interest, and strategic processing scores were used to predict group membership. Overall group membership was accurately predicted for 96.5% of the cases.

Results

1. What are the achievement and social goals adopted by students at different levels of expertise?

A series of MANOVAs was conducted to determine if there were significant differences in achievement goals, social goals, and psychology GPA between the Competent and Acclimated groups. Collectively, the MANOVA results indicated the groups did not significantly differ on psychology GPA but on achievement goals, $F (3, 137) = 18.36$, $p < .001$, $f^2 = .29$, and social goals, $F (3, 137) = 4.89$, $p = .003$, $f^2 = .09$. Follow-up ANOVA results indicated the Acclimated group reported higher levels of performance-avoidance goals and the Competent group reported

higher levels of mastery and performance-approach goals. Of the three types of social goals, the groups only differed on social concern goals, F (1, 139) = 10.80, $p < .001$, $f^2 = .07$. The Competent group reported higher levels of social concern goals than the Acclimated group. See Table 1 for results.

To further examine differences in achievement and social goals of students at different levels of expertise, students were categorized along low, moderate, and high levels of each type of achievement and social goal. Chi square analyses indicated the number of students at different levels of expertise significantly differed by level of goal on three types of goals: mastery goals [X^2 (2, $N = 141$) = 34.77, $p < .001$]; performance-approach goals [X^2 (2, $N = 141$) = 9.57, $p = .008$]; performance-avoidance goals [X^2 (2, $N = 141$) = 11.71, $p = .003$]; and social concern goals [X^2 (2, $N = 141$) = 7.67, $p = .022$]. The percentage of students in the Acclimated group classified at moderate and high levels of performance-avoidance goals was 93% ($n = 40$). The percentage of students in the Competent group classified at moderate and high levels of mastery, performance-approach, and social concern goals were 98% ($n = 95$), 93% ($n = 91$), and 87% ($n = 85$), respectively. Figure 1 provides the means and standard error of the achievement and social goals of students at different levels of expertise.

2. Do students at different levels of expertise differ in academic achievement?

ANOVA results indicated that students at different levels of expertise do *not* differ in academic achievement, F (1, 139) = 2.24, $p = .188$, $f^2 = .017$.

3. How do the components of the MDL relate to achievement and social goals?

A series of correlational analyses were conducted to examine the relations between the components of the MDL and goals. As presented in Table 2, domain knowledge was negatively

associated with social responsibility, r (139) = -.26, p = .002 and performance-avoidance goals, r (139) = -.39, p < .001. Interest was correlated with social approval, r (139) = .24, p = .004, social concern, r (139) = .35, p < .001, mastery, r (139) = .57, p < .001, performance-approach goals, r (139) = .35, p < .001, and performance-avoidance goals, r (139) = -.29, p < .001. Strategic processing was significantly related to each of the six types of goals: mastery goals, r (139) = .39, p < .001; performance-approach goals, r (139) = .39, p < .001; performance-avoidance goals, r (139) = .31, p < .001; social approval goals, r (139) = .36, p < .001; social concern goals, r (139) = .27, p < .001; and social responsibility goals, r (139) = -.46, p < .001.

4. Do multiple goals predict academic achievement?

A multiple regression analysis was conducted to test Barron and Harackiewicz' (2001) additive and interactive goal effects. Mastery goals (measured continuously), performance-approach goals (measured continuously), and the mastery goal*performance-approach goal interaction term (created using centered scores) were simultaneously entered as predictors. The dependent variable was psychology GPA. The full model was significant, R^2 = .17, F (3, 137) = 9.27, p < .001, f^2 = .20. Mastery goals (β = .214, t (138) = 2.68, p = .008) and performance-approach goals (β = .290, t (138) = 3.61, p < .001) were significant, positive predictors of psychology GPA. The interaction term did not predict psychology GPA and thus the additive goal pattern was supported.

Discussion

The present study integrated domain-learning theory and goal theory and enhanced our understanding of college learning several important ways. The first contribution of this study was that it expanded domain-learning research by demonstrating students at different levels of expertise adopt different goals. Whereas, the Acclimated group adopted performance-avoidance

goals, the Competent group adopted mastery, performance-approach, and social concern goals. The findings may imply, as suggested in MDL theory, that students' goals may play a role in the changes in knowledge, interest, and strategic processing that occur during the development of expertise (Alexander, 2000). However, longitudinal research is needed to determine whether the goals adopted by students at different levels of expertise are relevant to the changes in their knowledge, interest, and strategic processing.

Another contribution was support for the multiple goal perspective. The findings are consistent with results of previous research that found college students could simultaneously endorse mastery and performance-approach goals (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Elliot & Church, 1997; Harackiewicz et al., 1997, 1998, 2000; Pintrich & Garcia, 1991). More specifically, however, study results offered support for Barron and Harackiewicz's (2001) additive goal pattern. Results of correlational analyses indicated that interest and psychology GPA were each positively associated with mastery and performance-approach goals. Results of the multiple regression analysis indicated that mastery and performance-approach goals were each significant unique predictors of psychology GPA.

The third contribution was insight into college students' social goal orientations. Findings from this study demonstrated that student goal profiles can be comprised of achievement and social goals. Additionally, the study found social goals were positively related to some academic outcomes (e.g., interest, strategic processing) but negatively related to other academic outcomes (e.g., domain knowledge), suggesting additional research on social goals is needed.

The results of the study have educational implications. For example, the finding that students at levels of expertise adopted different goals revealed a more complex picture of the college learning process than previously reported in domain-learning literature, which supports

the argument that learning has to be viewed as a multidimensional process (Pintrich, Marx, & Boyle, 1993). Therefore, educators need to consider students' knowledge, interest, strategy use, and goal orientations when developing instructional environments to improve student learning and, possibly, retention. College administrators might want to incorporate interventions into remedial classes or first-year seminars that focus on providing learning experiences that guide students toward expertise. Additionally, college administrators could offer professional development that focuses on how to increase student interest within a domain and how to emphasize strategies relevant to learning within a particular domain.

In conclusion, the findings from this study provide support for the argument that learning must be viewed as a multidimensional process involving the interplay of cognitive and motivational variables (Alexander, 2003). Results suggest college administrators need to consider students' goal orientations when designing interventions to improve retention. In this study, however, it is not known whether students' goals change over time as they develop competence within a domain. Determining the goal orientations of the same students as they progress through the stages of expertise is an appealing inquiry for future research.

Figure 1. Means and Standard Error of Achievement Goals and Social Goals of Students at Different Levels of Expertise
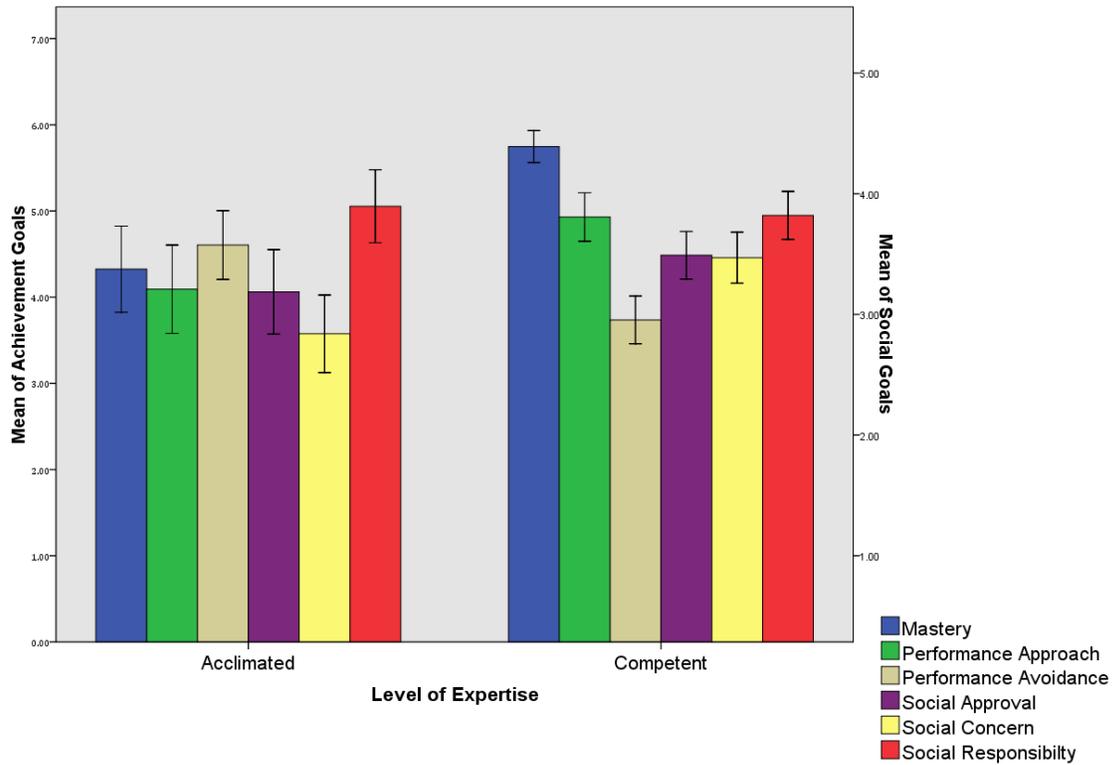
Note. N = 141. Vertical bars represent standard error. The left Y-axis represents the mean of the scale scores for mastery, performance-approach, and performance-avoidance, which could range from 1-7. The right Y-axis represents the mean of the scale scores for social approval, social concern, and social responsibility, which could range from 1-5.

Table 1

Means, Standard Deviations, F-Statistic, and p-Level of Study Variables for Students at Different Levels of Expertise

Variable	Range	Group	(*n*)	Mean	*SD*	*F*	*p-level*	f^2
Components of MDL								
Domain Knowledge	0-25	Acclimated	(43)	12.00	4.49			
		Competent	(98)	14.62	4.99	8.77	.004	.06
Interest	1-7	Acclimated	(43)	3.69	.68			
		Competent	(98)	5.79	.46	456.09	.001	.77
Strategic Process	1-7	Acclimated	(43)	4.19	.93			
		Competent	(98)	4.55	.88	5.09	.026	.04
Achievement Goals								
Mastery	1-7	Acclimated	(43)	4.33	1.64			
		Competent	(98)	5.75	.92	43.22	.001	.24
Performance Approach	1-7	Acclimated	(43)	4.09	1.68			
		Competent	(98)	4.93	1.39	9.49	.002	.06
Performance Avoidance	1-7	Acclimated	(43)	4.60	1.31			
		Competent	(98)	3.74	1.37	12.84	.001	.08
Social Goals								
Social Approval	1-5	Acclimated	(43)	2.88	1.14			
		Competent	(98)	3.19	.97	2.59	.110	.02
Social Concern	1-5	Acclimated	(43)	2.54	1.05			
		Competent	(98)	3.17	1.04	10.88	.001	.07
Social Responsibility	1-5	Acclimated	(43)	3.59	.98			
		Competent	(98)	3.51	.98	.177	.674	.001
Academic Achievement								
Psychology GPA	1.00-4.00	Acclimated	(43)	2.99	.77			
		Competent	(98)	3.20	.71	2.47	.118	.017

Table 2

Correlations for Study Variables for Total Sample (N = 141)

Variable	1	2	3	4	5	6	7	8	9	10
Academic Achievement										
1. Psychology GPA	--	..278**	.333**	.223**	-.032	-.050	-.076	.043	.111	.186*
Achievement Goals										
2. Mastery		--	.236**	-.270**	.233**	.300**	.152	.092	.566**	.387**
3. Performance-Approach			--	.013	.398**	.248*	.153	.123	.351**	.393**
4. Performance-Avoidance				--	.241**	-.032	.579**	-.393**	-.294*	.305**
Social Goals										
5. Social Approval					--	.334**	.597**	.002	.244**	.356**
6. Social Concern						--	.213*	.147	.354**	.271**
7. Social Responsibility							--	-.262	-.004	.460**

Note. * *p* < .05, ** *p* < .01

Table 2 continued

Correlations for Study Variables for Total Sample (N = 141)

Variable	8	9	10
Components of MDL			
8. Domain Knowledge	--	.291**	-.054
9. Interest		--	.269**
10. Strategic Processing			--

Note. * $p < .05$, ** $p < .01$

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