

## RESEARCH

# Identifying Achievement Goals and Their Relationship to Academic Achievement in Undergraduate Pharmacy Students

Saleh Alrakaf, MSc Pharm,<sup>a</sup> Erica Sainsbury, PhD,<sup>a</sup> Grenville Rose, PhD,<sup>b</sup> and Lorraine Smith, PhD<sup>a</sup>

<sup>a</sup> Faculty of Pharmacy, The University of Sydney, Sydney, New South Wales, Australia

<sup>b</sup> Aftercare, Sydney, New South Wales, Australia

Submitted July 1, 2013; accepted February 9, 2014; published September 15, 2014.

**Objectives.** To compare the achievement goal orientations of first-year with those of third-year undergraduate Australian pharmacy students and to examine the relationship of goal orientations to academic achievement.

**Methods.** The Achievement Goal Questionnaire was administered to first-year and third-year students during class time. Students' grades were obtained from course coordinators.

**Results.** More first-year students adopted performance-approach and mastery-approach goals than did third-year students. Performance-approach goals were positively correlated with academic achievement in the first year. Chinese Australian students scored the highest in adopting performance-approach goals. Vietnamese Australian students adopted mastery-avoidance goals more than other ethnicities. First-year students were more strongly performance approach goal-oriented than third-year students.

**Conclusion.** Adopting performance-approach goals was positively correlated with academic achievement, while adopting avoidance goals was not. Ethnicity has an effect on the adoption of achievement goals and academic achievement.

**Keywords:** achievement goals, achievement goal questionnaire, academic achievement, ethnicity

## INTRODUCTION

The role of goals in human motivation is critical.<sup>1</sup> Goals can be defined as a cognitive representation of future aims that a person is committed either to approach or avoid.<sup>2</sup> A class of goals that has received considerable attention in the educational field for more than 2 decades is achievement goals.<sup>3,4</sup> According to achievement goal theory, achievement goals are goals in which "competence" is the main aim for an individual.<sup>5</sup> Thus, achievement goals are defined as "a future-focused cognitive representation that guides behavior to a competence-related end state that the individual is committed to either approach or avoid."<sup>6</sup> Achievement goal theory tries to describe and understand the goals students adopt when dealing with academic activities and the reasons behind such adoption.<sup>7,8</sup> For example, when students face an academic activity, they adopt either 1 of 2 major types of achievement goals: mastery goals (ie, to try to learn and understand the task on hand) or performance goals (ie, to try to perform well compared to peers).<sup>1,9,10</sup> Achievement goal theorists believe that students who adopt mastery

goals and students who adopt performance goals view ability and define success vs failure differently.<sup>3</sup>

Students who adopt mastery goals tend to view their abilities as a flexible trait that can be enhanced by hard work, persistence, and continuous development of their skills,<sup>10</sup> while students who adopt performance goals view ability as a fixed trait that cannot be enhanced.<sup>11</sup> Mastery students use self-referential criteria in differentiating between success and failure (ie, feeling they learn what they need to learn or improve),<sup>10</sup> whereas performance students define success as outperforming their peers.<sup>6</sup> Thus, performance students who believe they have high ability will enjoy outperforming their peers, while performance students who believe they have low ability will avoid such challenges.<sup>3</sup>

In recent years, achievement goal theorists have further divided mastery goals and performance goals into 4 types: mastery-approach (ie, aiming to learn and understand the task at hand thoroughly), mastery-avoidance (ie, aiming to avoid losing previously acquired skills or to avoid not understanding the task at hand thoroughly), performance-approach (ie, aiming to outperform one's peers or to demonstrate one's ability to others), and performance-avoidance (ie, aiming to avoid performing worse than one's peers).<sup>12-15</sup> These distinctions are

---

**Corresponding Author:** Saleh Alrakaf, Faculty of Pharmacy, Room S114, Pharmacy and Bank Building A15, The University of Sydney, NSW, 2006. Tel: +61-2-9351-4501. Fax: +61-2-9351-4451. E-mail: salr4982@uni.sydney.edu.au

supported by a large body of empirical research and are robust in predicting and understanding student engagement and achievement.<sup>6,16,17</sup>

The mastery-approach goal has been linked to a number of positive effects such as deep learning,<sup>18</sup> high interest,<sup>19</sup> high persistence,<sup>20</sup> and help seeking.<sup>21</sup> Despite these beneficial effects, evidence suggests that students who adopt this type of goal orientation rarely attain high academic achievement (ie, grades).<sup>6,10</sup> The performance-approach goal, on the other hand, is associated with shallow learning strategies such as memorization<sup>22</sup> but linked to high academic achievement.<sup>8,10,23,24</sup> Performance-avoidance and mastery-avoidance goals have been associated with negative effects, especially in Western culture, such as stress and anxiety,<sup>25-27</sup> low academic achievement,<sup>28,29</sup> and low intrinsic motivation.<sup>30,31</sup>

In general, cross-sectional studies designed to compare undergraduate students' achievement goals are scarce. However, there is some evidence that suggests there are differences in the achievement goals adopted by students in different academic years. Lieberman and Remedios examined the achievement goals of 1857 undergraduate students from first, second, third, and fourth years who were studying in different disciplines such as psychology, business, biology, art, English, history, mathematics, and nursing at a Scottish university, and found that students in the first year were more mastery-approach oriented than students from any other year.<sup>32</sup> The authors attribute their findings to increased pressure on students as they advance through their academic life. This academic pressure undermines interest and enjoyment, and thus, significantly decreases pursuing mastery-approach goals. Another study conducted by Remedios et al to identify and compare the achievement goals of Russian undergraduate students, who were taking English studies course for business in different academic years, yielded strikingly similar results.<sup>9</sup> However, the authors explained their results in the context of the cultural shift in Russia caused by globalization, which influenced students to be more individualistic and pragmatic, with more emphasis on performance than mastery goals.

Only a few studies have aimed to investigate the relationship between ethnicity and achievement goals.<sup>33</sup> For example, Elliot and his colleagues found Asian American undergraduate psychology students adopted performance-avoidance goals more than their Anglo American peers.<sup>34</sup> The authors attributed these findings to subcultural differences between the 2 groups. In general, students from Asian backgrounds valued avoiding negative outcomes, whereas approaching positive outcomes was valued in Anglo American culture.<sup>34</sup> Similar findings have been found by Zusho et al; however, they

found that undergraduate Asian American students outscored their Anglo American peers in mathematics.<sup>35</sup>

Although more than 1000 publications and dissertations report the application of achievement goal theory,<sup>6</sup> only one of these (to our knowledge) is in the pharmacy education setting. Waskiewicz used a framework based on achievement goal theory to determine student motivation to achieve in a low stakes examination, compared to their motivation to pursue a doctor of pharmacy program.<sup>36</sup> The author found a significant relationship between situational motivation and performance-approach goal. However, no significant relationship was found between the same motivation and mastery-approach goal.

Achievement goal theory provides academics with invaluable understanding of how their students respond when they encounter academic activity.<sup>29</sup> By understanding students' achievement goals, academics might try to create an environment that can encourage those beneficial goals and limit the non-beneficial ones.<sup>7</sup> Yet the first step is to understand more about pharmacy students' achievement goals.

Therefore, the aims of this study are to compare the achievement goal orientations between first-year and third-year undergraduate pharmacy students, investigate Australian undergraduate pharmacy students' achievement goals and their relationship to their academic achievement, and examine the influence of different ethnicities on achievement goals and academic achievement.

## **METHODS**

This study received approval from the Human Research Ethics Committee, The University of Sydney, NSW Australia.

The bachelor of pharmacy degree program at the University of Sydney is a 4-year undergraduate course of study that qualifies graduates to apply for registration as a pharmacist in Australia.<sup>37</sup> The participants for this study were first-year and third-year undergraduate students in this program. In total, 380 students agreed to participate in the study.

We used the Achievement Goal Questionnaire (AGQ), which contains 12 items intended to measure the 4 types of achievement goals on a 7-point Likert scale (1=not at all true of me to 7=very true of me). Socio-demographic indicators included in the survey were gender, age, language spoken at home, and student identification (ID) number. Student ID numbers were used only for matching students' grades with the different types of achievement goals. Individual students could not be identified in the analysis. Completion of the survey instrument took approximately 10 minutes.

Data regarding participants' ethnicities were gathered by asking students to indicate the language spoken at home, which may be interpreted as more accurately reflecting the cultures of participants than asking for ethnicity in a general question.<sup>39</sup> Culture is a variable of interest as it is the prism through which individuals view the world and may specifically affect their approach to education.<sup>40</sup> Another benefit of this question is that it enabled us to identify participants' ethnicities with greater precision. For example, instead of writing "Asian" in answering an ethnicity question, a participant would indicate the precise ethnicity, such as Vietnamese or Korean, when identifying the language spoken at home.

The study was initiated in the second semester of the academic year in 2012. Students were invited to participate in the study during normal lectures or tutorials (ie, small group discussions). They were advised that participation was voluntary and if they chose to participate they could withdraw from the study at any time. In addition, students were advised that their decision to participate would not impact their academic performance results or influence student-teacher relationships. Researchers approached students as a group.

At the end of the semester, students' raw grades in 2 courses, Foundations of Pharmacy and Endocrine, Diabetes and Reproductive [System], were obtained from course coordinators. Foundations in Pharmacy is a first-year course aiming to introduce students to the pharmacy profession and the roles of pharmacists in the health care system.<sup>41</sup> Endocrine, Diabetes and Reproductive is a course taken in the third year that covers the pharmacotherapeutics of endocrine, diabetes and reproductive disorders.<sup>41</sup>

SPSS 20 (SPSS Inc, Chicago, Illinois) was used for all statistical analyses. Descriptive statistics regarding year group, gender, age, and language spoken at home were reported. Correlation analysis was used to determine the strength and direction of the relationships between achievement goals and academic achievement. An independent sample *t* test was used to compare the achievement goal orientations between first-year and third-year students. One-way analysis of variance (ANOVA) was used as preliminary analysis for multiple comparisons of predominant languages spoken at home and each type of achievement goal. A 2-way ANOVA was conducted to explore the impact of academic year (first or third) and predominant ethnicities on each achievement goal. Similar analysis was used to explore the same impact on academic achievement. All mean difference analyses were subjected to post hoc tests (Tukey test).

A direct logistic regression procedure was performed to determine the extent to which achievement goals and

languages spoken at home contributed to academic achievement. Academic achievement was transformed into a binary variable using the grade 74 as a cut point. Thus, students' grades were regressed as pass and credit vs distinction and high distinction. Languages spoken at home also were transformed into a binary variable (English/other languages). The Forced Entry Method was used to examine the odds ratios of all variables, even if not significant. A *p* value of less than 0.05 was considered significant for all analyses.

## RESULTS

Three hundred eighty (251 female, 128 male, and 1 gender unspecified) undergraduate pharmacy students from years 1 and 3, with a mean age of 19.7 years, agreed to participate in this study (76% response rate). Descriptive statistics for participants are reported in Table 1.

The predominant languages spoken at home (ethnicities) in approximately 90% of both classes of students were English, Chinese, Vietnamese, Korean, and Arabic. The number of different ethnicities reported by first-year and third-year students was 22 and 13, respectively.

Independent *t* test results (Table 2) revealed differences between first-year and third-year students in performance-approach and mastery-approach goals, with first-year students scoring significantly higher than third-year students in both. In contrast, no significant differences in the scores of first- and third-year students were observed for performance-avoidance and mastery-avoidance goals.

Correlations between achievement goals and grades are reported in Table 3. Among first-year students, higher scores on performance-approach goals were associated with higher grades. In the same year, adoption of performance-avoidance goals significantly correlated

Table 1. Demographics of First- and Third-Year Pharmacy Students

Academic Year	N	Gender, % Female	Age, Mean (SD)	Language, %
First-year	260	67.7	18.8 (2.12)	English, 28.4 Chinese, <sup>a</sup> 24.1 Vietnamese, 15.2 Arabic, 11.7 Korean, 8.2 Other, 12.4
Third-year	120	62.5	21.5 (3.56)	English, 39.0 Chinese, <sup>a</sup> 27.0 Korean, 13.6 Vietnamese, 8.5 Arabic, 5.1 Other, 6.8

<sup>a</sup> Chinese = Cantonese, Mandarin, Chinese, and Teochew languages.

Table 2. Achievement Goal Values in First- and Third-Year Pharmacy Students

	Mean (SD)	P
Performance-approach		
First-year	5.1 (1.3)	<0.001
Third-year	4.5 (1.4)	
Performance-avoidance		
First-year	5.6 (1.3)	0.25
Third-year	5.5 (1.3)	
Mastery-approach		
First-year	5.9 (1.0)	0.01
Third-year	5.6 (1.2)	
Mastery-avoidance		
First-year	4.8 (1.5)	0.15
Third-year	4.6 (1.4)	

with lower grades. Among third-year students, adoption of mastery-avoidance goals significantly correlated with lower grades. Although collapsing different Asian ethnicities (ie, Chinese, Vietnamese, and Korean) into one group has statistical appeal, yielding greater power, a one-way, between group ANOVA revealed significant differences at the  $p < 0.05$  level in performance-approach and mastery-avoidance goals and academic achievement scores among the 3 ethnic groups. Thus, each predominant Asian ethnicity was analyzed separately.

A 2-way, ANOVA was conducted to explore the impact of students' academic year and predominant ethnicity on each achievement goal. Ethnic differences in mean levels of goals and year are reported in Table 4. Regarding performance-approach goals, both academic years and ethnicity had significant impact. Post hoc comparisons of the main effect using the Tukey test indicated that Chinese Australian students reported higher performance-approach goals than their Anglo Australian and Korean Australian peers. No significant interaction was found between the predominant ethnicities and students' academic year. No significant impact was found from academic year (or predominant ethnicity) on performance-avoidance goals. The interaction effect between predominant ethnicity and academic year was not significant. Only academic year had a significant impact on mastery-approach goals. The interaction effect between predominant ethnicity and academic year was not

significant. The impact of academic year and ethnicity on mastery-avoidance goals was significant. Post hoc comparisons using the Tukey test indicated that Vietnamese Australian students reported higher adoption of mastery-avoidance goals than their Anglo Australian and Arab Australian peers. The interaction effect between predominant ethnicities and students' academic year was not significant.

A two-way, between-groups ANOVA was also conducted to explore the impact of academic year and predominant ethnicity on students' grades and are shown in Table 5. All effects were significant at the 0.05 level. The two-way ANOVA of students' grades based on year group showed that mean scores were significantly higher for third-year (Mean  $\pm$  SD, 74.7  $\pm$  8.8) compared to first-year (Mean  $\pm$  SD, 70.4  $\pm$  8.3). There was a significant main effect for ethnicity. Post hoc comparisons using the Tukey test lacked the power to determine where that difference was, beyond that it was between the ethnicities scoring highest and lowest in this study, which was determined from the main effect. The interaction effect between predominant ethnicities and academic year was not significant. Direct logistic regression was performed to assess the impact of a number of factors on the students' grades. The model contained 5 independent variables (the 4 achievement goals, and ethnicities). The full model containing all predictors was significant. The model as a whole explained between 5.1% (Cox and Snell R squared) and 6.9% (Nagelkerke R squared) of the variance, and correctly classified 63.9% of cases.

As shown in Table 6, only 2 of the independent variables made a unique significant contribution to the model (mastery-avoidance and other ethnicities). The strongest predictor of grades was mastery avoidance, recording an odds ratio of 0.83. This indicated that students who pursued the mastery-avoidance goal were less likely to achieve high grades than those who did not pursue this goal, controlling for all other factors in the model. Other ethnicities were also significantly predictive of higher academic achievement with an odds ratio of 1.62.

## DISCUSSION

For more than 2 decades, achievement goal theory has captured a considerable amount of attention in

Table 3. Correlations between Grades and Achievement Goals

Year	Grades	Performance-approach	Performance-avoidance	Mastery-approach	Mastery-avoidance
1	R	0.14	-0.14	0.06	-0.07
	P	0.04	0.03	0.32	0.27
3	R	0.05	-0.18	-0.16	-0.31
	P	0.61	0.06	0.09	0.001

Table 4. Ethnic and Year Group Achievement Goals , Mean (SD)

Goals, n=1st yr/3rd yr	Anglo 73/46	Chinese 62/32	Vietnamese 39/10	Korean 21/16	Arabic 30/6
Performance-approach					
Year 1					
5.0 (1.4) <sup>c</sup>	4.9 (1.5) <sup>a</sup>	5.3 (1.2) <sup>b</sup>	5.4 (1.1) <sup>a,b,c</sup>	4.6 (1.6) <sup>a,c</sup>	4.7 (1.4) <sup>a,b,c</sup>
Year 3					
4.6 (1.4) <sup>f</sup>	4.4 (1.6)	5.0 (1.2)	4.5 (1.4)	4.3 (1.3)	4.4 (1.3)
Performance-avoidance					
Year 1					
5.6 (1.3) <sup>a</sup>	5.6 (1.3) <sup>a</sup>	5.6 (1.2) <sup>a</sup>	5.9 (1.1) <sup>a</sup>	5.8 (1.4) <sup>a</sup>	5.3 (1.5) <sup>a</sup>
Year 3					
5.5 (1.2) <sup>a</sup>	5.6 (1.3)	5.4 (1.2)	5.8 (1.3)	5.3 (1.1)	6.3 (0.8)
Mastery-approach					
Year 1					
5.6 (1.0) <sup>c</sup>	6.0 (1.0) <sup>a</sup>	5.9 (0.8) <sup>a</sup>	6.0 (1.2) <sup>a</sup>	5.4 (1.4) <sup>a</sup>	5.7 (1.1) <sup>a</sup>
Year 3					
5.5 (1.2) <sup>f</sup>	5.5 (1.3)	5.3 (1.2)	5.8 (1.0)	5.7 (1.0)	4.4 (1.3)
Mastery-avoidance					
Year 1					
4.9 (1.5) <sup>c</sup>	4.6 (1.6) <sup>a,c</sup>	5.1 (1.1) <sup>a,b,c</sup>	5.5 (1.3) <sup>b</sup>	4.5 (1.5) <sup>a,b,c</sup>	4.3 (1.6) <sup>a,c</sup>
Year 3					
4.5 (1.3) <sup>f</sup>	4.2 (1.5)	4.7 (1.3)	4.8 (1.3)	4.6 (1.2)	4.3 (0.9)

Means in the same row that do not share the same superscripts differ significantly at  $p < 0.05$ .

education, with more than 1000 articles and dissertations being written using it as a framework.<sup>3,4,6</sup> Four types of achievement goals are acknowledged: mastery-approach, master-avoidance, performance-approach, and performance-avoidance.<sup>12-15</sup> The primary aims of this study were to identify Australian undergraduate pharmacy students' achievement goals, determine the relationships between goals and academic achievement, and compare the achievement goals of 2 different cohorts of undergraduate students. A secondary aim of this study was to investigate any relationships between ethnicity, type of achievement goals, and academic achievement.

Comparison of first-year and third-year students' results showed that first-year students were oriented more strongly toward performance-approach and mastery-approach goals than third-year students. Our finding that first-year students adopted mastery-approach goals more than third-year students is consistent with Lieberman and Remedios<sup>32</sup> and Remedios et al.<sup>9</sup> However, our findings regarding performance-approach differed from both previous studies. Results from Remedios et al. found no significant differences in the adoption of this goal among first-year, second-year, third-year, and fourth year students.<sup>9</sup> Lieberman and Remedios found third-year students adopted performance-approach goals more than first-year students. In our study, the higher adoption of performance-approach goals by first-year students compared to third-year students might have been a result of

competitive high school environments from which first-year students had just come.

Our results show that first-year students who adopted performance-approach goals received higher grades in their subject compared to their peers who adopted any other type of achievement goals. These findings are consistent with several previous studies that indicate the positive association between performance-approach and academic achievement.<sup>8,10,23,24,28,29,42</sup> Perhaps students

Table 5. Academic Achievement Mean (SD) Scores for Each Ethnicity in Both Year Groups

Ethnicity	Year (n)	Mean (SD)
Anglo		
Year 1	67	71.5 (9.0)
Year 3	45	75.0 (9.6)
Chinese		
Year 1	58	70.7 (6.7)
Year 3	29	76.0 (7.1)
Vietnamese		
Year 1	38	68.7 (7.4)
Year 3	8	70.6 (7.6)
Korean		
Year 1	17	65.0 (9.4)
Year 3	15	72.7 (9.2)
Arabic		
Year 1	28	72.5 (8.5)
Year 3	6	75.8 (10.4)

Table 6. Logistic Regression Analysis Examining Different Factors That Might Predict Academic Achievement.

	B	S.E.	p	Odds Ratio	95% C.I. for EXP(B)	
					Lower	Upper
Age	-0.046	0.046	0.319	0.955	0.872	1.046
Females	0.563	0.260	0.030	1.756	1.056	2.922
Performance-approach	0.073	0.086	0.395	1.076	0.909	1.273
Performance-avoidance	-0.157	0.090	0.082	0.854	0.716	1.020
Mastery-approach	-0.113	0.112	0.310	0.893	0.717	1.111
Mastery-avoidance	-0.191	0.085	0.024	0.826	0.700	0.975
Other ethnicities	-0.558	0.248	0.024	0.572	0.352	0.930
Constant	1.446	1.177	0.219	4.245		

The overall model is significant at  $P < 0.05$ .

who adopt a strong performance-approach goal orientation focus on topics that appear important and testable for their teachers. In contrast, students who are strongly mastery-oriented are more likely to follow their own interest and study subject material that is appealing to them regardless of its testability.<sup>43</sup> Almost all faculty members want their students to be curious and interested, and to use deep-learning strategies (ie, adopt a mastery-approach goal) when they study and, at the same time, attain higher grades (ie, adopt a performance-approach goal). Although reaping the benefits of both types of achievement goals is clearly beneficial, the task for educators is to develop ways to foster this combination. One way is by helping students pursue mastery-approach goals throughout the semester and then encouraging them to pursue performance-approach goals when preparing for examinations.<sup>19</sup> This can be achieved through appropriate curriculum development and an understanding of teacher qualities that enhance and support the delivery of course curricula.<sup>19</sup> These qualities, if adopted by academicians, might help create a combined mastery-approach and performance-approach environment.

Surprisingly, among the third year students, there was no significant relationship between academic achievement and performance-approach goals. This result was inconsistent with previous research findings.<sup>8,22,23,27-30</sup> Although our data did not allow us to elucidate why this was, we posit that the nature of the examined course (ie, Endocrine, Diabetes and Reproductive) did not support shallow learning strategies such as memorization. Thus, adoption of this type of achievement goal had no significant association with academic achievement.

In contrast to much of the published literature,<sup>33,34,44,45</sup> which has grouped different Asian ethnicities under one umbrella and applied findings to the whole group, our study clearly revealed that individual Asian ethnicities varied in their adoption of each type of achievement goal. Vietnamese students, for example, had significantly

higher scores on mastery-avoidance goal than their Korean peers, whereas Chinese students had significantly higher performance-approach goal scores than Korean students. To the best of our knowledge, this is the first study to analyze each Asian ethnicity separately, and doing so has yielded significant conclusions. Zusho et al did not find any significant difference between Asian American and Anglo American students in pursuing performance-approach goals,<sup>35</sup> but our study showed that Chinese Australian students were adopting performance-approach goals significantly more than their Anglo Australian peers, possibly because Chinese Australian parents expect high academic performance from their children.<sup>45</sup> However, there were no significant differences between Anglo Australian and Vietnamese Australian or Korean Australian students. Our finding that more Vietnamese Australian students adopted mastery-avoidance goals than did their Anglo Australian peers was consistent, to some degree, with literature that found more Asian students adopted avoidance goals than did Caucasian students.<sup>33,34,46</sup>

The contradictory findings of this study in comparison with previous research may be attributed to 3 factors. First, this study made a clear distinction between Asian ethnicities while most other studies have not, suggesting that a “one group fits all” approach misses the opportunity to more precisely understand different ethnic groups. Second, most published literature focuses on psychology students.<sup>34,35</sup> There might be a correlation among discipline-specific subjects, achievement goals, and academic achievement. Third, this study was conducted in Australia and given the multicultural nature of the country, particularly in Sydney, the study suggests that no single strategy may suit all Australian students, and that future work should address cultural differences more directly.

Although there was a significant impact of predominant ethnicities upon academic achievement, post hoc

comparisons were unable to determine the exact locations of the differences. Either a larger sample size of different ethnicities or a replication study with planned comparisons based on the current study would allow us to explore the fine-grain effect of each ethnicity.

This study was important in identifying undergraduate pharmacy students' achievement goals and the relationship of those goals to academic achievement. In addition, this study shed some light on the relationship between different ethnicities and achievement goals. As quantitative studies do not answer the question *why* such phenomena occur, a qualitative investigation of this phenomenon may yield useful additional results. In-depth interviews with a purposive sample of students from this study may yield more information regarding student adoption of one achievement goal over another, the relationship between academic achievement and performance-approach goals in third-year students, and ethnic differences. Further, understanding the qualities that mastery-approach and performance-approach students would like to see in their instructors may help academics create environments that foster the adoption of both goals.

Limitations of the study include the small sample size of some of the ethnic groups. For example, despite the significant impact of predominant ethnicities upon academic achievement, the Tukey test failed to determine where the significant differences were between each ethnicity. Another limitation was using cohorts from only one university. A study that includes undergraduate pharmacy students from different Australian universities may yield more generalizable results.

## CONCLUSION

Adopting performance-approach goals positively correlated with academic achievement, while adopting either performance-avoidance or mastery-avoidance goals did not. First-year students were more performance-approach and mastery-approach oriented than third-year students. Ethnicity affected achievement goals and academic achievement. Chinese Australian students indicated stronger preferences for adopting performance-approach goals, whereas Vietnamese Australian students adopted mastery-avoidance goals more than any other ethnicities.

## REFERENCES

1. Murayama K, Elliot AJ, Friedman R. Achievement goals. In: Ryan RM, ed. *The Oxford Handbook of Human Motivation*. New York, NY: Oxford University Press; 2012:191-207.
2. Elliot AJ, Fryer JW. The goal concept in psychology. In: Shah Gardner W, eds. *Handbook of Motivational Science*. New York, NY: Guilford Press.; 2008:235-550.

3. Senko C, Hulleman CS, Harackiewicz JM. Achievement goal theory at the crossroads: old controversies, current challenges, and new directions. *Educ Psychol*. 2011;46(1):26-47.
4. Meece JL, Anderman EM, Anderman LH. Classroom goal structure, student motivation, and academic achievement. *Annu Rev Psychol*. 2006;57:487-503.
5. Elliot AJ, Dweck CS. Competence and motivation: competence as the core of achievement motivation. In: Elliot AJ, Dweck CS, eds. *Handbook of Competence and Motivation*. New York, NY: The Guilford Publications Inc.; 2005:3-12.
6. Hulleman CS, Schrager SM, Bodmann SM, Harackiewicz JM. A meta-analytic review of achievement goal measures: different labels for the same constructs or different constructs with similar labels? *Psychol Bull*. 2010;136(3):422-449.
7. Kaplan A, Maehr M. The contributions and prospects of orientation theory. *Educ Psychol Rev*. 2007;19(2):141-184.
8. Harackiewicz JM, Barron KE, Tauer JM, Elliot AJ. Predicting success in college: a longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *J Educ Psychol*. 2002;94(3):562-575.
9. Remedios R, Kiseleva Z, Elliott J. Goal orientations in Russian university students: from mastery to performance? *Educ Psychol*. 2008;28(6):677-691.
10. Hulleman CS, Senko C. Up round the bend: forecasts for achievement goal theory and research in 2020. In: Urduan TC, Karabenick SA, eds. *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement*. Vol 16A. Bingley, UK: Emerald Group Publishing Limited; 2010:71-104.
11. Dweck CS. Motivational processes affecting learning. *Am Psychol*. 1986;41(10):1040-1048.
12. Elliot AJ. Approach and avoidance motivation and achievement goals. *Educ Psychol*. 1999;34(3):149-169.
13. Elliott JG, McGregor HA. A 2x2 achievement goal framework. *J Pers Soc Psychol*. 2001;80(3):501-519.
14. Elliot AJ, Thrash TM. Achievement goals and the hierarchical model of achievement motivation. *Educ Psychol Rev*. 2001;13(2):139-156.
15. Isoard-Gautheur S, Guillet-Descas E, Duda JL. How to achieve in elite training centers without burning out? An achievement goal theory perspective. *Psychol Sport Exerc*. 2013;14(1):72-83.
16. Huang C. Discriminant and criterion-related validity of achievement goals in predicting academic achievement: a meta-analysis. *J Educ Psychol*. 2012;104(1):48-73.
17. Shim SS, Cho Y, Wang C. Classroom goal structures, social achievement goals, and adjustment in middle school. *Learn Instr*. 2013;23:69-77.
18. Diseth A. Self-efficacy, goal orientations and learning strategies as mediators between preceding and subsequent academic achievement. *Learn Individ Differ*. 2011;21(2):191-195.
19. Harackiewicz JM, Barron KE, Pintrich PR, Elliot AJ, Thrash TM. Revision of achievement goal theory: necessary and illuminating. *J Educ Psychol*. 2002;94(3):638-645.
20. Wolters CA. Advancing achievement goal theory: using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *J Educ Psychol*. 2004;96(2):236-250.
21. Roussel P, Elliot AJ, Feltman R. The influence of achievement goals and social goals on help-seeking from peers in an academic context. *Learn Instr*. 2011;21(3):394-402.
22. Elliot AJ, McGregor HA, Gable S. Achievement goals, study strategies, and exam performance: A mediational analysis. *J Educ Psychol*. 1999;91(3):549-563.

23. Cury F, Elliot AJ, Da Fonseca D, Moller AC. The social-cognitive model of achievement motivation and the 2\* 2 achievement goal framework. *J Pers Soc Psychol.* 2006;90(4):666-679.
24. Barron KE, Harackiewicz JM. Revisiting the benefits of performance-approach goals in the college classroom: Exploring the role of goals in advanced college courses. *Int J Educ Res.* 2003;39(4/5):357-374.
25. Putwain DW, Symes W. Achievement goals as mediators of the relationship between competence beliefs and test anxiety. *Br J Educ Psychol.* 2012;82(2):207-224.
26. Elliot AJ, Pekrun R. Emotion in the hierarchical model of approach-avoidance achievement motivation. In: Schutz PA, Pekrun R, eds. *Emotion in Education.* San Diego, CA: Elsevier Academic Press; 2007:57-73.
27. Sideridis GD. The regulation of affect, anxiety, and stressful arousal from adopting mastery-avoidance goal orientations. *Stress Health.* 2008;24(1):55-69.
28. Murayama K, Elliot AJ. The competition-performance relation: a meta-analytic review and test of the opposing processes model of competition and performance. *Psychol Bull.* 2012;138(6):1035-1070.
29. Van Yperen NW, Elliot AJ, Anseel F. The influence of mastery-avoidance goals on performance improvement. *Eur J Soc Psychol.* 2009;39(6):932-943.
30. Linnenbrink-Garcia L, Middleton MJ, Ciani KD, Easter MA, O'Keefe PA, Zusho A. The strength of the relation between performance-approach and performance-avoidance goal orientations: theoretical, methodological, and instructional implications. *Educ Psychol.* 2012;47(4):281-301.
31. Van Yperen NW. A novel approach to assessing achievement goals in the context of the 2 x 2 framework: identifying distinct profiles of individuals with different dominant achievement goals. *Pers Soc Psychol Bull.* 2006;32(11):1432-1445.
32. Lieberman DA, Remedios R. Do undergraduates' motives for studying change as they progress through their degrees? *Br J Educ Psychol.* 2007;77(2):379-395.
33. Witkow MR, Fuligni AJ. Achievement goals and daily school experiences among adolescents with Asian, Latino, and European American backgrounds. *J Educ Psychol.* 2007;99(3):584-596.
34. Elliot AJ, Chirkov VI, Kim Y, Sheldon KM. A cross-cultural analysis of avoidance (relative to approach) personal goals. *Psychol Sci.* 2001;12(6):505-510.
35. Zusho A, Pintrich PR, Cortina KS. Motives, goals, and adaptive patterns of performance in Asian American and Anglo American students. *Learn Individ Differ.* 2005;15(2):141-158.
36. Waskiewicz RA. Achievement goal orientation and situational motivation for a low-stakes test of content knowledge. *Am J Pharm Educ.* 2012;76(4):Article 65.
37. Smith L, Saini B, Krass I, Chen T, Bosnic-Anticevich S, Sainsbury E. Pharmacy students' approaches to learning in an Australian university. *Am J Pharm Educ.* 2007;71(6):Article 120.
38. Elliot AJ, Murayama K. On the measurement of achievement goals: critique, illustration, and application. *J Educ Psychol.* 2008;100(3):613-628.
39. Marian V, Kaushanskaya M. Self-construal and emotion in bicultural bilinguals. *J MemLang.* 2004;51(2):190-201.
40. Yamauchi LA, Tharp RG. Culturally compatible conversations in Native American classrooms. *Linguist Educ.* 1995;7(4):349-367.
41. Sydney Uo. University of Sydney HandBooks. In: Sydney TUo, ed. *00026A.* Sydney, Australia: The University of Sydney 2012.
42. Harackiewicz JM, Barron KE, Tauer JM, Carter SM, Elliot AJ. Short-term and long-term consequences of achievement goals: predicting interest and performance over time. *J Educ Psychol.* 2000;92(2):316-330.
43. Senko C, Miles KM. Pursuing their own learning agenda: how mastery-oriented students jeopardize their class performance. *Contemp Educ Psychol.* 2008;33(4):561-583.
44. Kao G. Asian-Americans as model minorities? A look at their academic performance. *Am J Educ.* 1995;103(2):121-159.
45. Li J. Expectations of Chinese immigrant parents for their children's education: the interplay of Chinese tradition and the Canadian context. *Can J Educ.* 2001;26(4):477-494.
46. Lee AY, Aaker JL, Gardner WL. The pleasures and pains of distinct self-construals: the role of interdependence in regulatory focus. *J Pers Soc Psychol.* 2000;78(6):1122-1134.