RESEARCH ARTICLES

Changes in Pharmacy Student Motivation During Progression Through the Curriculum

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Objectives. This study was conducted to determine whether a shift in pharmacy students’ goal orientations (ie, motivation for learning) occurs during their professional education. Goal orientation consists of mastery, performance, and academic alienation.

Methods. Pharmacy students completed a survey instrument upon entry into the professional program and at the end of each spring semester through graduation.

Results. Sixty-six students completed all administrations of the survey instrument. Student scores on the mastery scale decreased an average of 0.33 per item (P<0.008) and scores on the academic alienation scale increased an average of 0.24 per item (P<0.006). Students also exhibited an average decrease of 0.52 per item (P<0.0001) on internal locus of control scores.

Conclusion. Pharmacy students have a mastery goal orientation. However, a shift from this goal orientation toward academic alienation was detected, with most of the change occurring during the first-professional year.

Keywords: motivation, goal orientation, longitudinal experience

INTRODUCTION
Pharmacy faculty members at the University of Arkansas for Medical Sciences have observed that students appear to enter professional degree programs highly motivated and then develop an attitude for learning “just what is necessary to pass the test” as they progress through the curriculum. With 28 new therapeutic agents being approved by the Food and Drug Administration in 2003 alone, lifelong learning will be important to pharmacists if they are going to remain competent in the practice of pharmacy throughout their careers.1 Considering this, pharmacy educators should be fostering the development of lifelong learning skills in students. One precursor to becoming a lifelong learner is having a motivation or willingness to exert effort towards educational goals.

Several research studies pertaining to student motivation have been conducted.2-6 For example, Garavalia et al investigated variations in self-regulated learning strategies and motivation between first-year and third-year pharmacy students.2 They found that first-year students are more externally motivated than third-year pharmacy students. In another study, Hobson identified factors that motivate students to learn in large class settings.4 Students reported that teacher attitudes/behavior and course structure are important positive and negative motivators.

Archer, who developed a goal orientation instrument to conceptualize university student motivation, suggested that students could be categorized as having a preference for mastery orientation (defined as “desire to develop competence”), performance orientation (defined as “desire to demonstrate competence”), or academic alienation (defined as “no desire to develop or demonstrate competence”).7 Archer’s results showed that some students are motivated to “master” the material, others are motivated to just demonstrate that they know the material (eg, pass the test), and still others are not motivated to learn the material. Perrot and colleagues’ modified Archer’s student motivation instrument to develop a health professions student motivation survey instrument.6 Hastings and colleagues used this instrument to determine whether student motivation changes in pharmacy students during their first professional year.5 The authors surveyed the entering pharmacy students at a southern university in the fall of 1999 and then again at the end of the academic year to determine whether a change in motivation was occurring. Students shifted from a mastery goal orientation toward academic alienation in their first year of pharmacy school. Also, their internal locus of control decreases significantly from the fall to the spring semester of the students’ first year of pharmacy school.5
Locus of control refers to an individual’s perception of what controls his or her behavior. People with internal locus of control believe they control their behavior and rewards, while people with external locus of control believe their behavior does not matter as much and that the rewards are dependent on external circumstances.

While this initial study identified a shift in goal orientation and locus of control, it raised another important question: does this shift toward academic alienation and external locus of control continue throughout the pharmacy education experience? Further research was needed to determine if this slight shift is an isolated event or if this shift continues throughout the curriculum; and if so, whether there is any practical significance. For educators to be successful at motivating students, we need to understand what their goal orientation is while in pharmacy school.

To determine if the shift continued or perhaps even reversed itself, in this study the authors measured student motivation in a group of students for the remainder of their pharmacy education experience. Further research was needed to determine if this slight shift is an isolated event or if this shift continues throughout the curriculum; and if so, whether there is any practical significance. For educators to be successful at motivating students, we need to understand what their goal orientation is while in pharmacy school.

**METHODS**

This research was approved by the University’s Investigational Review Board prior to beginning the study. Eighty pharmacy students enrolled in the College of Pharmacy at the University of Arkansas for the Medical Sciences were recruited to participate in the study. All the students entered pharmacy school in the fall of 1999. The students were asked to complete the student motivation survey instrument upon entry into pharmacy school and then at the end of each spring semester throughout their degree program (ie, spring 2000, 2001, 2002, and 2003). Each student was assigned an identification code so that the student could be followed all 4 years. Students completed the survey instrument during regularly scheduled class time.

The study used the Modified Archer’s Health Professions Motivation Survey (HPMS) instrument to measure student goal orientation. This survey instrument consisted of the following scales and subscales:

1. Learning strategies measured whether students tend to use metacognitive or surface learning tactics.
2. Measurements were made of students’ preference for difficult and easy tasks.

Sample questions are presented in Table 1. The goal orientation scale consisted of 3 subscales: mastery, performance, and academic alienation.

Responses were scored on a 5-point Likert-type scale, on which a 1 represented the least favorable response and a 5 represented the most favorable response.

### Table 1. Sample Questions from Modified Archer’s Health Professions Motivation Survey

<table>
<thead>
<tr>
<th>Category Heading</th>
<th>Sample Items Under Heading (Goal Orientation/Locus of Control*)</th>
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</thead>
</table>
| Think back over this academic year. In general, when did you feel most successful? | 1. When I didn’t have to work too hard. (A)  
2. When a lecture or tutorial made me think about things. (M)  
3. When I was the only one who could answer the question. (P) |
| In general, how satisfied did you feel when you… | 1. Learned something new? (M)  
2. Found the work easy? (A)  
3. Got one of the highest grades? (P) |
| In general, how much do you agree with these statements? | 1. The more challenging the task, the harder I work. (M)  
2. Good grades are important to me. (P)  
3. Lecturers should not expect students to study material they won’t be tested on. (A) |
| When you felt greatly satisfied or positive about yourself, was it because you… | 1. Understood something for the first time? (M)  
2. Received recognition or prestige? (P)  
3. Were involved totally in something that you were doing? (M) |
| If you do well this year, it is because… | 1. You have ability in this area. (I)  
2. The lecturers did a good job in lectures and tutorials. (E)  
3. The work was not hard. (E) |
| If you do poorly this year, it is because… | 1. The work was very difficult. (E)  
2. The lecturers did a poor job in lectures and tutorials. (E)  
3. You do not have ability in this area. (I) |

*Goal orientation/Locus of control: M=mastery orientation; P=performance orientation; A=academic alienation; I=internal locus of control; E=external locus of control.
For each respondent, the scores for each scale and subscale were calculated by adding the rating for each item (in the scale/subscale) and dividing by the number of items. Demographic data, including gender, age range, current marital status, and racial or ethnic identification, were collected during the first survey instrument administration. Students’ grade point averages for the first-professional year and Pharmacy College Admissions Test (PCAT) scores were also available.

Completed survey instruments were electronically scanned using Remark 6.5 (Principia, Malvern, Penn) software and data were downloaded to SPSS 13.0 (Chicago, Ill) for statistical analysis. Means and standard deviations were calculated for each scale, subscale, and item. Correlation analysis and t tests were used to determine whether demographic or academic performance was related to goal orientation scores. Data were further analyzed using continuous repeated measures ANOVA to determine changes in mean scores over time.

Table 2. Scores* for Pharmacy Students During Each Professional Year

<table>
<thead>
<tr>
<th></th>
<th>Fall 1999 Mean (SD)*</th>
<th>Spring 2000 Mean (SD)</th>
<th>Spring 2001 Mean (SD)</th>
<th>Spring 2002 Mean (SD)</th>
<th>Spring 2003 Mean (SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery goal orientation</td>
<td>4.00 (0.43)</td>
<td>3.77 (0.52)</td>
<td>3.82 (0.47)</td>
<td>3.75 (0.47)</td>
<td>3.67 (0.28)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Performance goal orientation</td>
<td>3.74 (0.49)</td>
<td>3.71 (0.52)</td>
<td>3.74 (0.50)</td>
<td>3.71 (0.52)</td>
<td>3.52 (0.05)</td>
<td>0.0257</td>
</tr>
<tr>
<td>Academic alienation goal orientation</td>
<td>2.77 (0.59)</td>
<td>3.13 (0.77)</td>
<td>3.01 (0.70)</td>
<td>3.05 (0.72)</td>
<td>3.01 (0.59)</td>
<td>0.0006</td>
</tr>
<tr>
<td>Internal locus of control</td>
<td>4.08 (0.56)</td>
<td>3.73 (0.74)</td>
<td>3.77 (0.62)</td>
<td>3.80 (0.65)</td>
<td>3.55 (0.37)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>External locus of control</td>
<td>3.13 (0.77)</td>
<td>3.40 (0.85)</td>
<td>3.35 (0.76)</td>
<td>3.47 (0.75)</td>
<td>3.22 (0.52)</td>
<td>0.0188</td>
</tr>
<tr>
<td>Learning Style-Metacognitive</td>
<td>3.92 (0.57)</td>
<td>3.66 (0.67)</td>
<td>3.72 (0.64)</td>
<td>3.72 (0.66)</td>
<td>3.52 (0.46)</td>
<td>0.0084</td>
</tr>
<tr>
<td>Preference for difficult task</td>
<td>3.48 (0.99)</td>
<td>2.83 (1.08)</td>
<td>3.01 (1.08)</td>
<td>2.86 (1.03)</td>
<td>3.14 (0.99)</td>
<td>0.0006</td>
</tr>
<tr>
<td>Preference for easy task</td>
<td>3.30 (1.00)</td>
<td>4.08 (0.91)</td>
<td>3.63 (0.97)</td>
<td>3.86 (0.89)</td>
<td>3.25 (0.85)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

*The mean scores are the averages of each respondent's subscale score. The subscale score was calculated by adding the ratings for each item in the subscale and dividing by the number of items. Ratings were measured using a 5-point Likert-type scale. The higher the score, the more favorable the response.

RESULTS

Eighty students were enrolled in the study; however, only 66 students completed all 4 years of the study. Some students did not progress through the curriculum and other students did not complete the survey instrument each time it was administered. Seventy-one percent of the participants were 23 years of age or younger at the beginning of the study. Forty percent were male and 93% were Caucasian.

Scores on the survey instrument indicated that all of the pharmacy students initially had a mastery goal orientation; however, this declined slightly towards a performance goal orientation as they progressed through the curriculum. [AU: OK?] Students rated the items pertaining to academic alienation the lowest. The students also exhibited a stronger internal locus of control compared to external locus of control during all 5 data collections. The mean scores for each scale/subscale upon entering pharmacy school and upon completing pharmacy school are displayed in Table 2. No differences in goal orientation or locus of control scores between gender and age groups were found. Additionally, in the first-professional year, no correlation existed between goal orientation and locus of control scores and GPA or PCAT scores.

Throughout the study, students preferred mastery goal orientation and exhibited a strong internal locus of control; however, their goal orientation did change during their pharmacy experience. Figure 1 depicts the mean score for each goal orientation for the entire group of students at each time period. Mean scores on the mastery scale decreased by 0.23 and mean scores on the academic alienation scale increased by 0.36 in the first-professional year. Performance goal orientation did not change in the first-professional year, but did in the fourth-professional year. The shift toward academic alienation did not continue and students maintained a mastery goal orientation.
The students who experienced a shift away from mastery orientation tended to use fewer metacognitive learning tactics \((p=0.0084)\) and have less preference for difficult assignments \((p=0.0006)\). Those students who did not shift orientation did not change preference for tasks either. There was a preference for easier assignments. During their first year, students’ preference shifted toward easier tasks (fall 1999 mean score = 3.30; spring 2000 mean score = 4.08); however, this preference shifted back. By spring 2003, students’ mean preference score for easy tasks was even lower than when they entered pharmacy school (spring 2003 mean = 3.25).

There was also a change in locus of control. The mean score for internal locus of control decreased significantly from fall 1999 (mean score = 4.08) to spring 2003 (mean score = 3.55; \(P < 0.001\)). Alternatively, the mean score for external locus of control increased slightly from fall 1999 (mean score = 3.13) to spring 2003 (mean score = 3.22; \(P < 0.0188\)). Thus, as students shifted away from a mastery goal orientation, they tended to demonstrate less internal locus of control.

**DISCUSSION**

Although the students’ goal orientation remained mastery, students shifted from this goal orientation toward academic alienation, particularly during their first-professional year. Although we cannot say conclusively what is causing the shift, a shift does occur, particularly during the first-professional year. After this change occurs, students maintained their mastery goal orientation without further academic alienation. A previous study showed that this shift occurs but did not examine at what point. This longitudinal study indicated that the majority of the change in motivation occurs during the first-professional year.

The results of this study provide insight into where the shift occurs, but do not provide insight into the cause of the shift. One can hypothesize that the shift is due to a change in the academic environment, method of teaching, or amount of coursework and tests. Some students are new to the city and the university setting, and the amount of material they are required to learn the first year may seem overwhelming. The first-year curriculum at this University consists primarily of basic sciences and is foundational in nature. Students are perhaps disappointed that they are not immediately learning about the practice of pharmacy and therapeutics. Another possible explanation for the shift in goal orientation is that the initial survey results are artificially shifted toward a mastery goal orientation. Students enter pharmacy school excited about learning and mastering the material. Then as they progress through the curriculum they shift back to their baseline goal orientations. Thus, the shift away from a mastery goal orientation during the first year is not really a shift away from this preference but a shift back to baseline. Determining what causes the shift is difficult. Moreover, ascertaining whether this shift in the first year occurs only at our University or is experienced by students at other pharmacy colleges is also difficult. Further investigation is needed to determine what factors are contributing to this shift in motivation during the first-professional year.

This initial shift away from a mastery goal orientation may be what our faculty members observed prior to the study. This change in goal orientation may contribute to the students’ attitude of learning only what material is necessary to pass the test. This phenomenon is interesting because while educators are emphasizing the acquisition of lifelong learning skills in professional students, the curriculum and learning environment may be moving students away from this attitude. However, while the shift is statistically significant, determining whether it is educationally significant is difficult. Perhaps the shift is so small that it does not affect a student’s desire to learn and continue to learn after graduation. By further studying students’ goal orientations and what factors influence them, we can determine whether this information has practical applications for improving pharmacy education. If it does, we could develop interventions that may be helpful in motivating students. Possible interventions that might help students during their first-professional year include mentoring programs that provide assistance with study habits, stress management seminars, and tutorials.

**Limitations**

There are several limitations to this study. First it was conducted at one University. Thus the results are not generalizable to other colleges of pharmacy. Second, demographic information was only collected at the beginning of the study. A change in marital status or other significant life event could have influenced a student’s motivation. Third, 14 students did not complete the study, and we do not have data on these 14 students. These 14 students may have had different goal orientations. Fourth, students completed the motivation survey instrument 5 times. The repetition of the same survey instrument year after year could have resulted in some students giving the answers they thought we wanted to hear.

**CONCLUSIONS**

Similar to the findings of other studies, this study demonstrated that pharmacy students have a mastery goal orientation. During the first-professional year, pharmacy
students tend to shift slightly away from this orientation and may even become academically alienated. Fortunately, this trend does not continue. Overall, pharmacy students continue to be motivated by mastery goal orientation. Further studies are needed to determine why a shift occurs in the first-professional year and what interventions could be developed to prevent this from happening.

ACKNOWLEDGEMENTS
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REFERENCES