

## Pharmacy Student Motivation: Phase 1 of a Longitudinal Study

Jan K. Hastings and Donna S. West

*College of Pharmacy, University of Arkansas for Medical Sciences College of Pharmacy, Little Rock, AR 72205-7199*

L.J. Perrot and Linda A. Deloney

*College of Medicine, University of Arkansas for Medical Sciences College of Medicine, Little Rock, AR 72205-7199*

This study was conducted to determine whether a shift in pharmacy students' goal orientation (*i.e.*, motivation for learning) occurs during their first year of professional education. Goal orientation consists of three constructs: mastery, performance, and academic alienation. Eighty first-year pharmacy students completed the survey instrument, which measured students' goal orientation, in the fall semester and again in the spring semester. Results indicated that over the course of the year, student scores on the mastery scale decreased an average of 0.24 per item ( $P < 0.006$ ) and scores on the academic alienation scale increased an average of 0.38 per item ( $P < 0.007$ ). Students also exhibited an average decrease of 0.31 per item ( $P < 0.001$ ) on internal locus of control scores. Although the students' goal orientation remained mastery, these results suggest that students are shifting from this goal orientation to academic alienation. Further research is needed to determine if this phenomenon continues throughout the professional curriculum.

### INTRODUCTION

With rapid advances being made in medicine, it is necessary for pharmacists to be life-long learners after graduation from pharmacy school in order to remain competent in pharmacy practice. The importance of the development of life-long learning skills is reflected in the American Council of Pharmaceutical Education's Accreditation Manual for Professional Programs, where life-long learning skills are specifically addressed under Standard Number 12: Teaching and Learning Processes(1). A 1993 study of factors motivating pharmacy students to enter residencies or fellowships showed 'gaining knowledge and experience' to be the number one reason given for pursuing post-graduate education(2). Although this is not always true, generally, students pursuing post-graduate education seem more likely to have the desire to learn merely for the sake of learning. While a student's professional education should foster the development of such skills; active, independent, life-long learning requires self motivation as well(3).

Motivation is a psychological concept that refers to a person's willingness to put forth effort in order to achieve educational goals. Active, independent, self-directed learning requires motivation. Various theoretical models for describing and measuring motivation can be found in the literature. One example is Atkinson's formula for motivation:  $Motivation = f(Motive \times Expectancy \times Incentive)$ . This formula delineates motivation as the strength of a motive, multiplied by the expectancy that the required effort will achieve an incentive, multiplied by the person's value of the incentive(4). Another example is Dweck's model of motivation which proposed a research-based model of motivational processes to describe how children's reactions to success and failure are influenced by their goal orientation. This theory centers on psychological

factors that affect an individual's adeptness at achieving and using new skills. Dweck stated that, "The study of motivation deals with the cause of goal-orientated activity."(5) It was suggested that students who believe intelligence is a "fixed trait" focus on demonstrating performance (*e.g.*, making good grades), whereas students who believe intelligence can be increased desire to focus on developing competence (*e.g.*, mastering a concept)(5). Dweck labeled these goal-orientated activities as either mastery or performance.

In 1994, Archer tested Dweck's theory on motivation in university students and added the construct of academic alienation to the model. She developed a survey instrument designed to measure motivation of university students by categorizing their preferred achievement goal orientation as either mastery (defined as desire to develop competence), performance (defined as desire to demonstrate competence), or academic alienation (defined as no desire to develop or demonstrate competence). Archer found that preferences toward goal orientation could be measured in university students. She also found that students with a mastery orientation tended to use more metacognitive learning tactics (*e.g.*, asking faculty for assistance, checking understanding of the topic) and demonstrated an internal locus of control (*i.e.*, belief that they are in charge of their own learning)(5).

Perrot and colleagues conducted a study using a modified version of Archer's instrument to determine its validity for measuring motivation in health care professional students(6). The study confirmed Archer's hypothesis of the measurement of goal orientation and strengthened the idea that goal orientation has three constructs: mastery, performance and academic alienation(5,6).

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**Table I. Demographic results**

	n (percent)
Gender	
Male	32 (40)
Female	48 (60)
Age	
23 or younger	57 (71)
24-29	20 (25)
30 or older	3(4)
Marital Status	
Married	26 (33)
Not married	54 (67)
Race	
Caucasian	74 (94)
Non-caucasian	6(6)

The origin of this study comes from the authors' observation that year after year, students appear to enter professional degree programs highly motivated and then develop an attitude for only learning 'just what is necessary to pass the test' as they progress through the curriculum. The hypothesis for this change in behavior is that a situational shift from one goal orientation to another has occurred. This phase of a longitudinal study was designed to identify whether a change in goal orientation occurs during the first year of pharmacy school.

## METHODS

**Subject.** Study participants included 80 students enrolled in the first year of their professional pharmacy education during the 1999-2000 academic year at a college of pharmacy located in a southern state.

**Instrument.** The study used the Modified Archer's Health Professions Motivation Survey (HPMS), as displayed in Appendix A, to measure student goal orientation. This survey consisted of the following scales and subscales.

- 1. Goal orientation.** A 41-item scale that measures students' goal orientation. The goal orientation scale consisted of three subscales: mastery, performance, and academic alienation.
- 2. Learning strategies.** A 15-item scale that measures whether students tend to use metacognitive or surface learning tactics.
- 3. Preference for difficult and easy tasks.** A two-item scale that consists of a subscale to measure preference for easy assignments and a subscale to measure preference for difficult assignments.
- 4. Causal attributions for success and failure.** A 10-item scale that measures locus of control. This scale is composed of two subscales: internal locus of control and external locus of control.

Responses were scored on a five-point Likert-type scale, where one represented the 'least' favorable response and five represented the 'most' favorable response, as shown in Appendix A. 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, racial or ethnic identification, and highest undergraduate degree earned, were also collected.

**Table II. Mean scores<sup>a</sup> for students in the fall 1999 and spring 2000 semesters**

	Fall 1999	Spring 2000
Mastery goal orientation	4.01	3.77
Performance goal orientation	3.77	3.71
Academic alienation goal orientation	2.77	3.10
Internal locus of control	4.12	3.80
External locus of control	3.15	3.43
Preference for difficult task	3.48	2.83
Preference for easy task	3.30	4.08

<sup>a</sup>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 five-point Likert-type scale. The higher the score, the more favorable the response.

**Data Collection.** In the second week of the fall semester, the surveys were distributed and completed by the students during a regularly scheduled class meeting. The students completed the survey again during a regularly scheduled class meeting three weeks before the end of the academic year.

**Statistics.** Completed surveys were electronically scanned using Remark Software and data was downloaded to SPSS-PC™ for statistical analysis. Means and standard deviations were calculated for each scale, subscale, and item. Data were further analyzed using analysis of variance (ANOVA) and analysis of covariance (ANCOVA) (covariates included demographic variables). Statistical significance for the major subscales was set at the 0.01 level of significance. T-tests with Bonferroni correction for item-wide testing was used and statistical significance for individual items on scales was set at the 0.0007 level of significance.

## RESULTS

Because the students were given time during a regularly scheduled class period to complete the survey, the response rate was 100 percent for both data collections. Demographic results are presented in Table I. The demographics revealed that our college has little student diversity. What effect this had on our results is undeterminable, but might make the results not applicable to a pharmacy college with a very diverse student population. Overall, pharmacy student scores on the survey indicated preference for mastery goal orientation, followed by performance goal orientation. 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. The mean score for each subscale are displayed in Table II.

Of specific interest are the trends observed in these findings. The mean score for mastery goal orientation significantly decreased from 4.01 in the fall to 3.77 in the spring ( $P<0.006$ ). Similarly, the mean score on the academic alienation scale significantly increased by 0.38 ( $P<0.007$ ). The mean score increased from 2.77 in the fall to 3.10 in the spring. These results indicate that students are shifting from a mastery goal orientation toward an academic alienation goal orientation.

Using item-wide testing, the investigators were able to identify items that students rated significantly different in the fall and spring semesters, as displayed in Appendix A. For example, students were less satisfied in working on a challenging task or assignment ( $P<0.0001$ ) in the spring semester

compared to the fall semester. Alternatively, students were more interested in tests and grades in the spring semester compared to the fall semester, as indicated by the significantly increasing scores on the following two items.

- “As long as I pass the course I don’t care what grade I get.” ( $P < 0.0000$ )
- “Lecturers should not expect students to study material they won’t be tested on.” ( $P < 0.0000$ )

These items suggest that students exhibit less desire to develop competence. A change in motivation may be one attributing factor.

As students shift away from mastery goal orientation, it appears that they also tend to use fewer metacognitive learning tactics. A significant difference between the two semesters was found for the following item: “I find it hard to stick to a study schedule.” In the spring, the mean score was 2.90 compared to 2.18 in the fall ( $P < 0.0000$ ). Likewise, the results indicated that students were less willing to “choose a difficult assignment where they might make a lot of mistakes but learn a lot” in the spring semester compared to the fall semester ( $P < 0.0000$ ). It appears as though students’ study skills diminished while their preference for easier assignments increased. Again, it is not conclusive as to what is causing the shift.

The results also demonstrate a change in locus of control. The mean score for internal locus of control decreased significantly from the fall semester (mean score = 4.12) to the spring semester (mean score = 3.80) ( $P < 0.001$ ). Alternatively, the mean score for external locus of control did not change significantly from the fall semester (mean score = 3.15) to the spring semester (mean score = 3.43). It is of interest to note however that scores for the following two items representing external locus of control did change significantly.

- “If you do well this year, it is because the lecturers did a good job in lectures and tutorials.” ( $P < 0.0001$ )
- “If you do poorly this year, it was because the work was difficult.” ( $P < 0.0000$ )

It is suggested that as students shift away from mastery goal orientation, they also tend to demonstrate less internal locus of control.

## DISCUSSION

The results of this study agree with the findings of previous studies that provide evidence that students, while not ‘always mastery’ or ‘always performance,’ do demonstrate a strong preference for goal orientation, which can be identified and measured. The preference for mastery orientation, initially noted in the pharmacy students, was expected because the students were motivated enough to apply and be accepted in pharmacy school. Even though overall the students retained a mastery orientation, the decrease in scores on the mastery items along with the increase in the academic alienation scores indicate that there is a shift in students’ goal orientation sometime in the first year. The change in scores on certain items within the scales provides us insight into specific areas where problems may lie. The significant increase in the item, “As long as I pass the course I don’t care what grade I get,” is reflective of the mentality noted by the researchers prior to this study.

The results of this study support the research hypothesis that a small situational shift from one goal orientation to another occurs during the first year of pharmacy school. It is suggested that this change in goal orientation contributes 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 life-long learning skills in professional students, the curriculum and learning environment may be moving students away from this attitude. If this shift away from mastery goal orientation continues as the students’ progress through the curriculum, it could effect the students’ life-long learning skills.

It is important to note that although statistical differences were found in motivational scores, it is not clear as to the educational significance of this. Burn-out, spring fever, or some other unidentified factor may be attributing to the shift. The students remain mastery goal oriented throughout the course of the year. Further research is needed to determine if this slight shift is an isolated event or if this shift continues throughout the curriculum and if it continues, is there any practical significance. For educators to be successful at instilling life-long learning skills in professional students, educators must continue to learn about and address student motivation.

## CONCLUSIONS

This study, while it identified a shift in goal orientation, raises many questions as to the explanation behind the cause of the shift. Does the current delivery of information somehow frustrate the student? Is the shift related to competition for grades and scholarship funds? Since our first year curriculum is lecture format, would a problem-based learning curriculum have the same effect? Comparing students in a traditional curriculum with lecture-formats to students in a primarily problem-based learning environment is a potential direction for future study.

This research is ongoing and the authors are following this class throughout their professional education, surveying them at the end of each successive academic year to observe any further changes in their goal orientation. The authors are also investigating correlations between the changes noted in goal orientation and academic markers such as Pharmacy College Admission Test (PCAT) scores, undergraduate grade point average, and class rank to see if any of these markers are predictive of which students will be successful in our curriculum.

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**APPENDIX A. MODIFIED ARCHER'S HEALTH PROFESSIONS MOTIVATION SURVEY<sup>a</sup>**

**Think back over this academic year. In general, when did you feel most successful? (1= not successful at all and 5= very successful)**

	Fall mean	Spring mean	Univariate test P<0.0007
1 When I showed people I was good at something.	3.26	4.01	0.0005
2 When a lecture or tutorial made me think about things.	3.63	3.53	0.2449
3 When I did almost no work and got away with it.	2.34	2.88	0.0366
4 When I got a higher grade than other students.	3.95	3.94	0.6417
5 When I learned something interesting.	4.15	3.90	0.0614
6 When I showed people that I was smart.	3.66	3.64	0.3157
7 When something I learned made me want to find out more.	4.0	3.61	0.0156
8 When I didn't have to work too hard.	2.73	3.21	0.0300
9 When I was the only one who could answer the lecturer's question.	3.74	3.57	0.1821
10 When all the tasks and assignments were easy.	3.98	3.39	0.1077

**In general, how satisfied did you feel when you... (1= not satisfied at all and 5= very satisfied)**

11 Learned something new?	4.36	4.00	0.0203
12 Did better than other students in the class?	4.11	3.89	0.1278
13 Found the work easy?	3.75	3.71	0.9261
14 Realized you were getting through the course without having to work hard?	3.31	3.51	0.5458
15 Read something interesting?	4.03	3.58	0.0016
16 Worked hard?	4.33	3.87	0.0024
17 Realized you didn't have to prepare for tutorials?	3.25	3.23	0.9324
18 Worked on a challenging task or assignment?	4.03	3.33	0.0001
19 Saw improvement in your work?	4.63	4.40	0.0444
20 Got one of the highest grades?	4.60	4.36	0.0078
21 Did well without having to work hard?	3.45	3.53	0.8917

**If you had to choose an assignment to do, how likely is it that you would choose ... (1= not likely and 5= very likely)**

22 A difficult assignment where you might make a lot of mistakes, but eventually you will learn a lot?	3.48	2.83	0.0000
23 An assignment that would require little work or worry and probably you would get a high grade?	3.3	4.08	0.0003

**In general, how much do you agree with these statements? (1= do not agree at all and 5= strongly agree)**

24 The more challenging the task, the harder I work.	4.47	4.01	0.0053
25 If someone is evaluating me I tend to expect the worst.	3.11	3.26	0.1480
26 I like to be the best person in my group.	3.48	3.46	0.9233
27 I am usually worried about what impression I make.	3.69	3.57	0.9021
28 I'm always thinking of ways to improve how I do things.	4.11	3.78	0.0059
29 Good grades are important to me.	4.49	4.10	0.0108
30 As long as I pass the course I don't			

care about the grade I get.	1.79	2.93	0.0000
31 I put in long hours of work just to do a good job.	4.09	3.71	0.0110
32 I feel very upset when I commit some sort of error.	3.65	3.92	0.1676
33 I like to compete against myself.	3.79	3.81	0.6300
34 The opinions that important people have of me cause me little concern.	2.12	2.48	0.3136
35 I get anxious when I don't know how well I'm doing.:	3.93	3.99	0.2692
36 Lecturers should not expect students to study material that they won't be tested on.	2.68	3.46	0.0000
37 I am often afraid that I look ridiculous or make a fool of myself.	2.74	2.68	0.5604
38 As long as you do enough work to pass, it doesn't matter whether or not you learn anything.	1.43	1.65	0.2614

**When you felt greatly satisfied or positive about yourself, was it because you ... (1= do not agree at all and 5= strongly agree)**

39 Accomplished something that others in your class could not do?	3.88	3.81	0.5261
40 Understood something for the first time?	4.46	4.44	0.7802
41 Were involved totally in something that you were doing?	4.29	4.06	0.2190
42 Received recognition or prestige?	4.01	3.92	0.2526
43 Enhanced your status in the group?	3.68	3.49	0.3406

**For each statement below, choose the answer that best describes you. (1= not at all typical of me and 5= very much typical of me)**

44 I take time to plan a study schedule.	3.63	3.22	0.0856
45 When I study, I set goals for myself.	3.93	3.42	0.1053
46 When I study, I try to decide what I am supposed to learn rather than just read over the material.	4.09	3.82	0.6667
47 When I prepare tasks/assignments, I try to pull together the information from lectures, tutorials, and my own reading.	4.23	4.07	0.4240
48 When course work is difficult, I either give up or only study the easy parts.	1.63	1.89	0.0479
49 Even when course material is uninteresting, I keep working at it.	3.86	3.58	0.2872
50 When I study, I summarize material I get from lectures/tutorials and readings.	3.91	3.78	0.9159
51 I usually put off preparing tasks and assignments until the last minute.	2.29	2.97	0.0011
52 I often find myself covering extra material even when I know it won't Be on the test.	2.58	2.31	0.0316
53 I try to relate what I am studying to other things I know about.	3.88	3.89	0.5321
54 I try to make all topics in a course Fit together.	3.75	3.78	0.6901
55 I read information over and over again.	3.70	3.38	0.0815
56 I think about and do other things during lectures and tutorials.	2.15	2.78	0.0008
57 I find it hard to stick to a study schedule.	2.18	2.90	0.0000
58 I do practice exercises or study questions.	4.08	3.31	0.0040

**If you do well this year, it is because ... (1= not an important reason and 5= an important reason)**

59 You have ability in this area.	3.89	3.86	0.8571
60 The lecturers did a good job in lectures and tutorials.	4.19	3.52	0.0001

61	You worked hard.	4.75	4.42	0.0091				
62	The work was not difficult.	2.30	2.52	0.5285				
63	You used effective strategies to complete tasks and assignments.	4.52	3.99	0.0008				
<b>If you do poorly this year, it would be because ... (1= not an important reason and 5= an important reason)</b>								
64	The work was very difficult.	3.12	3.94	0.0000				
65	The lecturers did a poor job in lectures							
					and tutorials.	3.01	3.71	0.0034
					66 You do not have ability in this area.	2.82	2.93	0.3039
					67 You did not use effective strategies to complete tasks and assignments	4.28	3.71	0.0030
					68 You did not work hard enough.	4.38	3.75	0.0035

<sup>a</sup>The mean score for each item was calculated using the ratings on a five-point Likert-type scale. The higher the score, the more favorable the response.