RESEARCH ARTICLES

Motivating Factors Influencing College Students' Choice of Academic Major

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Objectives. To assess the factors, motivations, and nonacademic influences that affected the choice of major among pharmacy and nonpharmacy undergraduate students.

Methods. A survey was administered to 618 pharmacy and nonpharmacy majors to assess background and motivational factors that may have influenced their choice of major. The sample consisted of freshman and sophomore students enrolled in a required speech course.

Results. African-American and Hispanic students were less likely to choose pharmacy as a major than Caucasians, whereas Asian-Americans were more likely to choose pharmacy as a major. Pharmacy students were more likely to be interested in science and math than nonpharmacy students.

Conclusion. Students' self-reported racial/ethnic backgrounds influence their decision of whether to choose pharmacy as their academic major. Results of this survey provide further insight into developing effective recruiting strategies and enhancing the marketing efforts of academic institutions.

Keywords: major field of study, career, motivating factors, pharmacy students, race/ethnicity, African-American, Asian-American, Hispanic

INTRODUCTION

Pharmacists are in high demand due in part to a persisting pharmacist shortage that is expected to worsen until 2020.[1,2] The situation coincides with changes in the profession as well as in the demographics of pharmacy students. In the last 3 decades, the number of female pharmacy students has increased dramatically as has the number of pharmacy students with diverse racial/ethnic backgrounds. Based on data from 102 (99%) colleges and schools of pharmacy in 2006-2007, of the total applications submitted to colleges of pharmacy, 59.2% were from female applicants; and 38% were from white Americans; 30.4%, Asian Americans; 13.6%, underrepresented groups (9.2% black, 4.0% Hispanic, 0.4% American Indian); and 4.6%, foreign/non-prominent residents.[3]

Beginning in the late 20th century, the profession's philosophy also evolved from product-centered to patient-oriented, placing more emphasis on patient-centered care by the pharmacist and therefore on communication in pharmacist-patient relationships.[4] Such relationships are built upon effective communication skills, including listening and questioning and having cultural competence and sensitivity, especially during patient counseling.[5] Considering the crucial role of the pharmacist in today's society, it is important for pharmacy programs to identify students' motivations for choosing pharmacy as their academic major.

A 1963 study of 385 first-year students in a 5-year pharmacy program found that the motivating influences for choosing pharmacy as a major included a desire to earn a high salary, an interest in chemistry, and a desire to help.[6] Another early survey comparing 1,569 health science majors (eg, dental hygiene, dentistry, medicine, nursing, pharmacy, and public health), including 422 freshmen and senior pharmacy students, found that the pharmacy students, regardless of age, were more likely than other students to choose the major for practical reasons, such as: expectation of economic security, expectation of advancement in position and social prestige, and opportunity to fulfill one's financial needs immediately.[7] Neither of these studies provided demographic information about the participants.

A study conducted about 25 years later of 250 pharmacy students found the top factors for choosing pharmacy were: desire a career in the health field, desire to help people, opportunity to earn a high salary, job security, and respected occupation. The top 5 individuals who influenced the students' decision in choosing the career were pharmacists, mother, father, other relatives, and personal

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friends. One hundred sixty-eight (67.2%) of the participants were female, and 68.8% were white; 17.2%, Hispanic; 6.9%, oriental; and 2.0%, black. Despite the inclusion of demographic information, the study did not analyze racial/ethnic background as a factor in the students' choice of the major.[8]

A study of 114 pharmacy and 112 nonpharmacy students to determine what influenced their selection of academic major found that career prestige, earning potential, flexibility of career, and availability of jobs were the factors that had greatest influence.[9]

In a study to identify factors that influenced first-year pharmacy students' decision to pursue a doctor of pharmacy (PharmD) degree respondents across all racial groups reported to have been influenced by a person with a similar racial background, including a family member, pharmacist or pharmacy student, college instructor/advisor or high school counselor, or other healthcare professional.[10]

In a New Zealand study of 351 bachelor of pharmacy students (European, 39%; Chinese, 19%; Korean, 9%; Taiwanese, 7%; Malay, 6%; [Fijian] Indian, 6%; and Middle Eastern5%) to determine students' motivations, attitudes, and intentions to study pharmacy, the top 4 motivations reported were caring for/helping people, interest in human biology, interacting with people, and receiving a high salary.[11]

The purpose of this study was to conduct a comprehensive analysis, combining demographic and motivational factors, of the influencing factors among St. John's University (STJ) students' pursuing a PharmD degree. More specifically, this study was conducted to answer 2 major research questions: (1) How do student background factors influence the choice of pharmacy as an academic major? (2) How do pharmacy majors differ in their motivations from non-pharmacy majors?

METHODS

This study was conducted at the College of Pharmacy and Allied Health Professions at St. John's University, a Catholic institution in Queens, New York, with over 20,000 students, and one of the most culturally diverse universities in the country located within the most culturally diverse borough in the United States.[12]

The pharmacy degree is configured as a 0-6 program. A survey instrument was designed that was broadly applicable to students of any major; however, the focus of this study was to compare pharmacy and nonpharmacy majors. A majority of the items were students' responses to open-ended questions collected by the college. A few additional questions were taken, with the authors' permission, from a previous study that explored business students' choice of major.[13] The survey instrument was pilot tested with 5 undergraduate students to determine its clarity and the amount of time required to complete it.

The 72-question survey instrument was divided into 7 short sections. The first section comprised 4 Likert-scale questions that addressed students' familiarity and confidence in their career choice and major. The second section comprised 12 Likert-scale questions that asked respondents to indicate how important specific statements about future expectations for lifestyle and career affected their choice of major. The third section included 6 Likert-scale questions that asked students to rate the importance of specific motivations in choosing a major. Section 4 comprised 20 Likert-scale questions that asked students to rate the importance of specific factors pertaining to the curriculum and financial aspects associated with the major. The fifth section asked respondents to rate the importance of specific influences on choices of major using 5 Likert-scale questions. Section 6 targeted just the pharmacy students and included 6 Likert-scale questions on which students were to rate their level of agreement or disagreement with specific statements about their decision to major in pharmacy. Section 7 contained 1 open-ended item asking participants to state the least appealing reason to major in pharmacy. Sections 1, 6, and 7 were not included in this study for not being related to motivation, being directed to pharmacy students only, and for requiring a qualitative analysis, respectively. Section 8 included 9 demographic questions assessing major, age range, sex, family income, and ethnicity.

The survey sample focused primarily on undergraduate freshman and sophomore students in general and more specifically on pharmacy students. The participants were enrolled in a required core speech course: either Interpersonal Communication for the Pharmacist, which was required for all pharmacy majors, or Public Speaking, which was required for all other majors. These courses are routinely taken during either the freshman or sophomore year. Verbal permission from the faculty members teaching these courses was obtained prior to conducting the survey. The study was approved by the University Institutional Review Board prior to recruitment of students for the study.

The questionnaire was administered in the spring and fall semesters of 2006 during the speech classes either by a faculty member or a designated student aide who obtained oral informed consent from the students in the class. Those who agreed to participate in the survey were given a numbered questionnaire and a matching envelope. After completing the survey measurement, students placed their response sheet in the envelope, sealed it, and returned it to the proctor. Participation in the study was anonymous and strictly voluntary. The procedure

took 10-15 minutes in each class. All completed survey instruments were returned to the primary investigator who kept them. Subjects who failed to complete 75% of any section of the survey were excluded from the analysis.

To determine the relationship between various demographic factors and choice of major, a hierarchical logistical regression was performed with majoring in pharmacy as the criterion variable. The variables were entered in the following order to control for demographic effects: sex of respondent, family income, racial/ethnic background, and whether or not the respondent was born in North America.

RESULTS

Five hundred fifty-three students participated in the survey (89.5% response rate). One hundred four questionnaires were excluded from the analysis due to incomplete data in one or more of the sections. To ensure that the comparison group of students (nonpharmacy majors) were equivalent in age to the study group (all 24 years or under), the 25 respondents in the comparison group who were over 24 years of age were removed from the analysis. Thus, our final sample was comprised of 425 students, 170 pharmacy majors and 255 nonpharmacy majors.

Participants were nearly evenly divided based on gender, with slightly more females (53.2%) than males (46.8%). The majority (85.8%) were under 20 years of age. Among those who responded to the item regarding family income, responses were fairly evenly distributed across 5 categories (less than $25,000, between 25,000 and 50,000, between 50,000 and 75,000, between 75,000 and $100,000, and $100,000+). However, a significant portion of the participants did not know their family income (n=76), so this variable was not included in the findings. The majority of students were either Caucasian (40.3%) or Asian (31.5%). More than three-quarters (81.9%) were born in North America, as shown in Table 1.

Table 1. Demographics of College Students Who Participated in a Study to Identify Factors Influencing Choice of Major (N=425)

Variable	Nonpharmacy Majors (n = 255)	Pharmacy Majors (n = 170)
Sex of respondent		
Male	127	72
Female	128	98
Continent of birth		
Born in North America	219	129
Born outside North America	36	41
Ethnicity		
African-American	27	4
Hispanic	42	2
Asian	39	96
Other	29	17
Caucasian	118	51

As part of the analysis, all subsections were evaluated and only sections 2 and 4 were moderately correlated, $r(420)=0.35$. Thus, within sections 2 through 5, factor analyses were performed to create scales within each of the areas thought to impact choice in major. All factor analyses utilized principle components with varimax rotation. Any factors with eigen values greater than 1 were considered distinct and this corresponded with the pattern observed on the scree plot. Additionally, given the low number of items in several of these scales, we elected to use scale factors with reliabilities above 0.65. Items within each section that detracted from a factor's reliability were dropped.

Section 2, which focused on career lifestyle expectations, yielded 3 factors (Table 2): the first factor was related to family/personal life issues (reliability = 0.65); the second factor was related to business/professional ambitions (0.68); the third factor was related to material-focused ambitions (0.83).

Section 3, which focused on various motivations, yielded a single factor with a reliability of 0.82. Section 4, which focused on academic factors, yielded 5 factors (Table 3). The first factor was related to career considerations (0.74). The second factor related to life experiences/openness to experiences (0.73). The third factor was science and math interest (0.79). The fourth factor measured student work expectations (0.70). The last factor related to school reputation (0.65).

To identify any effects of demographic variables such as sex, ethnicity, and whether the respondents' parents were born outside North America, and any subsequent differences in the various factors affecting choice of major, a hierarchical logistic regression was computed comparing pharmacy and nonpharmacy majors. To control for the effects of demographics, the following items were entered into the first step of the regression: sex of respondent, whether respondent was North American or foreign born, and respondent's ethnicity. Ethnicity was entered as a categorical variable with 5 levels and Caucasians were used as the baseline group. In the second step, the 10 significant factors relating to choice of major were entered.

The overall model was significant, demonstrating that collectively all 13 variables increased accuracy in predicting the choice to major in pharmacy, $p < 0.001$. In the full model, 87.5% of the nonpharmacy majors were predicted correctly; 81.8% of the pharmacy majors were correctly classified, resulting in a correct classification

Table 2. Factor Loadings for Statements Integrating Career and Lifestyle (Section 2) of College Students Who Participated in a Study to Identify Factors Influencing Choice of Major

How important are the following statements to you?	Factor Loading
Factor 1: Family/Personal life focused (Cronbach's α=.65)	
Balancing a personal life with a career	0.75
Having opportunities for family/children	0.72
Having time for leisure	0.60
Having job security	0.51
Having an engaging career	0.45
Factor 2: Business/Professional focused ambitions (Cronbach's α=.68)	
Running my own business	0.78
Graduating in a short period of time	0.67
Having a high reputation career	0.59
Helping or serving others	0.55
Having a flexible work schedule	0.48
Factor 3: Material focused ambitions (Cronbach's α=.83)	
Making lots of money	0.82
Satisfying my material goals (own a home, nice cars, etc.)	0.81

percentage of 85.2%. This increased classification rate means that knowledge of sex, ethnic background, respondents' continent of birth, and motivational factors improves predictability of pharmacy majors 25.2% over the baseline accuracy of 60% based upon the distributions of majors in the sample.

In the first step, the 3 demographic variables accounted for a significant increase in accuracy in predicting the choice to major in pharmacy $p < 0.001$. Whether the respondent was born in North America did not appear to affect the decision to major in pharmacy. The sex of the respondent was marginally related to the

Table 3. Factor Loadings for Factors within the Academic Environment (Section 4) of College Students Who Participated in a Study to Identify Factors Influencing Choice of Major

How important are the following factors in your choice of major?	Factor Loading
Factor 1: Career considerations (Cronbach's α=.74)	
Job security	0.74
Projected earnings	0.70
Current job market	0.67
Parental influence	0.66
Flexible work hours	0.60
Factor 2: Life experiences/Openness to experiences (Cronbach's α=.73)	
Personal experience	0.73
Previous job experience	0.70
Enjoy reading and writing	0.67
Enjoy interacting with other people	0.63
Factor 3: Science focused (Cronbach's α=.79)	
Interested in science	0.88
Like chemistry	0.86
Did well in math	0.72
Factor 4: Student work expectations (Cronbach's α=.70)	
Less memorizing	0.85
Less writing	0.84
Course requirements	0.51
Factor 5: School reputation (Cronbach's α=.65)	
Quality of instruction	0.76
Work is interesting	0.67
Reputation of major at school	0.48

decision to major in pharmacy, though this marginal effect disappeared in the second step of the analysis. In contrast, self-defined ethnicity was highly predictive of the decision to major in pharmacy. African-Americans and Hispanics were significantly less likely to major in pharmacy than Caucasians ($OR=0.7$; $p = 0.031$; and $OR=0.1$; $p = 0.002$, respectively), whereas Asian-Americans were significantly more likely to major in pharmacy than Caucasians ($OR=5.9$; $p < 0.001$).

In the second step, the 10 motivational variables increased the accuracy of the model, $p < 0.001$. Looking to the future, pharmacy students were less interested in family/personal life consideration ($OR=0.3$; $p=0.016$) and less interested in attaining material goals than nonpharmacy students ($OR=0.6$; $p = 0.027$). In contrast, when focusing on their career expectations in the immediate academic environment, pharmacy students were more likely to endorse a positive career focus ($OR=9.1$; $p < 0.001$). They were also more likely to be interested in science and math than nonpharmacy students ($OR=3.9$; $p < 0.001$). Compared to nonpharmacy majors, pharmacy students were less likely to report that engagement in the academic environment in terms of life experiences/openness to experiences predicted their choice in major ($OR=0.4$; $p < 0.001$). Similarly, student work expectations also played less of a role in the decision to major in pharmacy than their nonpharmacy peers ($OR=0.7$; $p = 0.030$). Pharmacy majors reported less aversion to academic demands than nonpharmacy majors. Further, pharmacy students reported being less influenced by others in their decision to major in pharmacy ($OR=0.7$; $p = 0.030$). Finally, pharmacy students did not differ from their nonpharmacy peers in terms of their interest in business, their general response to career motivations, and concern about the university's status.

In addition to these motivational factors, we also collected data about familiarity and confidence in students' choice of major. Compared to nonpharmacy students, pharmacy students reported being more familiar with their intended career choice ($p < 0.001$), reported being more familiar with their intended major ($p = 0.01$), and rated the importance of their major to their career as higher ($p < 0.001$). However, pharmacy students reported similar levels of confidence in reaching their career goals as nonpharmacy students ($p = 0.61$).

DISCUSSION

Our findings suggest that the pharmacy major is less likely to appeal to African-American and Hispanic students. These findings should be considered in light of AACP reports, which indicate that, despite an increase in the number of African-American and Hispanic applicants in the past 3 decades, these groups remain underrepresented in the profession.

Unlike previous research, this study was conducted in a highly multicultural institution located in the most culturally diverse borough in the United States. In other words, a highly multicultural academic institution located in the most culturally diverse county does not automatically guarantee a pharmacy student body that is representative of all cultures. It is possible that such universities do not address the unique needs and concerns of underrepresented groups when recruiting students.

As reported in AACP's Fall 2008 Profile of Pharmacy Students, of the total 5,844 minority students enrolled in US colleges and schools of pharmacy, 1588 (27%) were enrolled at 6 "minority" universities, or those that traditionally serve underrepresented groups: Florida A&M, Hampton, Howard, Puerto Rico, Texas Southern, and Xavier; and 799 (more than 50%) were enrolled in Florida A&M and Xavier.[14] As suggested by Hays, institutions having disproportionately fewer African-American and Hispanic students might benefit from adapting strategies used by minority universities to attract these students.[15] Nonetheless, additional research studies, particularly qualitative ones, are needed to investigate factors that influence underrepresented students' choice of major. Such studies can help further explore these students' perceptions of the major and the culture of their universities.

In addition, academic institutions must identify their strengths and areas that need improvement in order to enhance recruitment and retention of underrepresented students in pharmacy. Academic institutions ought to candidly determine whether their environments promote intellectual and personal growth for students with diverse cultural backgrounds. For example, are African-Americans and Hispanics adequately represented among both the faculty and the staff? Are the graduates of these underrepresented groups invited to serve as guest speakers or mentors? Are the faculty and staff members knowledgeable about and sensitive toward diverse cultures? Another helpful approach, suggested by others, is the establishment of exchange student programs between majority and minority universities. Finally, considering that 0-6 pharmacy programs draw their applicants almost entirely from high schools, and given the insufficient preparation of a significant portion of K-12 minority students for higher education, including inadequate science education,[16] universities should offer special introductory courses to prepare these students. Involving underrepresented faculty and/or staff academic institutions should develop outreach programs to expose underrepresented minority high school students to the possibilities for a career in pharmacy. Future research

should include qualitative as well as quantitative studies to determine these high school students' preconceived notions about pharmacy. Such efforts are critical if we are to fully prepare the next generation of pharmacy students to meet the challenges of a multicultural world.

Our findings also suggest that the pharmacy major is more likely to appeal to Asians. This finding is consistent with previous studies which have shown that health sciences, such as pharmacy, tend to be more popular among Asians.[17] Asians constitute the largest non-Caucasian group among both pharmacy school applicants and US pharmacists.[3] Further studies are needed to determine the possible reasons for the underrepresentation of Hispanics and African-Americans in pharmacy, especially given the demographic distribution of these groups in Queens County: 26.5% Hispanics, 21.3% Asians, and 20.9% blacks.[18]

In this study, pharmacy majors were more likely than nonpharmacy majors to be interested in science and math. This supports the finding of previous studies that an interest in science is one of the main motivators for students to choose a pharmacy major, particularly Asians.[6,19,20] In industrialized societies such as the United States, Asian-Americans tend to opt for health- or technology-related fields because these professions offer economic security as well as high income and, therefore, provide a greater chance for advancement.[21] These are significant factors in immigrants' survival in a host culture.[22] Contrary to these data, our study population did not consider these factors as highly motivational. This finding suggests that above and beyond demographic factors, these motivational variables impact the decision to major in pharmacy.

While it is important for pharmacy students to be interested in science because it constitutes a major part of the professional curriculum, interest in the human component of pharmacy (relating to and educating and caring for patients) is also important. These tasks require communication and are thus crucial to pharmacist-patient relation, and also a significant part of the Omnibus Budget Reconciliation Act of 1990 (OBRA '90), which places emphasis on patient counseling.[5,23]

Our findings suggest that in recruiting students, the primary question would be: ''To what extent does the applicant demonstrate the personal skills necessary to relate to patients?'' At St. John's University, all pharmacy students are required to take the course Interpersonal Communication for the Pharmacist during the first or second year of the PharmD curriculum. Nevertheless, ''In-person standardized interviews of applicants,'' a criterion put forth by the Accreditation Council for Pharmacy Education, effective as of July 1, 2007, should also help to attain this desired outcome.[24]

Compared to nonpharmacy majors, pharmacy students were less likely to report engagement in the academic environment, both in terms of life experiences/openness to experiences. This finding is not surprising about students in 0-6 year pharmacy programs in general, in that they carry an extremely heavy and rigid academic load. The finding is also not surprising about St. John's University pharmacy majors in particular, because many of them tend to come from middle- and lower-middle class backgrounds and have to work as well as maintain a challenging course load.

Pharmacy students reported being less influenced by others in their decision to major in pharmacy. This finding does not support a recent study in which the students were influenced to pursue pharmacy by certain key individuals in their lives, including family members.[10] This finding may be a function of the pharmacy population being younger, possessing stronger academic profile, or being self-motivated. It may also be indicative of a strong role model.

According to our findings, pharmacy students reported being more familiar with their intended career choice and their intended major than nonpharmacy students, and rated the importance of their major to their career as higher. Since this program is a 0-6 year program, it attracts many focused, high-achieving students who have a clear vision of what the pharmacy major offers. Further, since the curriculum is highly structured, students in the pharmacy program may have an advantage in linking the major and the career together. Further longitudinal studies are needed to determine whether similar or different results emerge during advanced years in the curriculum.

The present study had the following limitations. First, the survey was conducted only among students at 1 large university. Our program is a 0-6 program and the student population may differ from that recruited by the majority of pharmacy schools, which admit students to the PharmD program only after completion of at least 2 years of a pre-pharmacy curriculum. Second, the findings may be generalized only to other urban settings with a culturally diverse student body. Not only is St. John's University a culturally diverse university, but it is also located in a highly multicultural area of New York City. Third, the statistical analysis does not reflect the unique way of life of each country within Asia. Further studies are needed to determine more culture-specific results, such as the impact of the different countries' cultural tendencies on the pharmacist-patient relationship.

CONCLUSION

This study sampled a diverse population of pharmacy and nonpharmacy students and examined a wide range of motivational factors (eg, personal experience, enjoy

reading and writing, less memorizing, and less writing) and demographics variables including race/ethnicity, to investigate the factors that influenced students' pursuit of the PharmD degree. The findings of this study suggest that African-Americans and Hispanics are less likely to pursue a major in pharmacy than Caucasians, whereas Asian-Americans are more likely to choose pharmacy as a major than Caucasians; and that pharmacy majors are more likely to be motivated by an interest in science and math. Results of this survey provide further insight into developing effective recruiting strategies and enhancing the marketing efforts of academic institutions.

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REFERENCES

1. American Association of Colleges of Pharmacy. Available at: http://www.answers.com/topic/american-association-of-colleges-of-pharmacy. Accessed March 24, 2010.
2. Kenreigh CA, Wagner LT. The pharmacist shortage. *Medscape*. Available at: http://www.medscape.com/viewarticle/521115. Accessed March 24, 2010, 2008.
3. Danielle A, Taylor MPP, Patton JM. The pharmacy student population: applications received 2006-07, degrees conferred 2006-07, fall 2007 enrollments. *Am J Pharm Educ.* 2008;72(Supp):Article S6.
4. Aita V, McIlvain H, Backer E, McVea K, Crabtree B. Patient-centered care and communication in primary care practice: What is involved? *Patient Educ Counseling*. 2004;58(3):296-304.
5. Berger BA. *Communication Skills for Pharmacists: Building Relationships, Improving Patient Care.* 2nd ed. Washington, DC: American Pharmacists Association; 2005.
6. Burlage HM. Motivating influences to the study of pharmacy. *Am J Pharm Educ.* 1963;27:75-80.
7. Pratt R. Analysis of a pilot study of factors that motivate individuals to elect the health sciences as a career, with special reference to pharmacy. *Am J Pharm Educ.* 1965;20:175-190.
8. Rascati KL. Career choice, plans, and commitment of pharmacy students. *Am J Pharm Educ.* 1989;53(3):228-34.
9. Lobb WB, Shah M, Kolassa EM. Factors influencing the selection of a major: A comparison of pharmacy and nonpharmacy undergraduate students. *J Pharm Teach.* 2004;11(2):45-64.
10. Anderson DC, Jr, Sheffield MC, Massey Hill A, Cobb HH. Influences on pharmacy students' decision to pursue a doctor of pharmacy degree. *Am J Pharm Educ.* 2008;72(2):Article 22.
11. Capstick S, Green JA, Beresford R. Choosing a course of study and career in pharmacy—student attitudes and intensions across three years at New Zealand School of Pharmacy. *Pharm Educ.* 2007;7(4):359-373.
12. U.S. Census Bureau. Diversity index. http//www.census.gov/population/cen2000/atlas/divers.xls. Accessed December 3, 2008.
13. Kim D, Markham FS, Cangelosi JD. Why students pursue the business degree: A comparative of business majors across universities. *J Educ Bus.* 2002;78(1):28-32.
14. AACP Institutional Research Report Series, Profile of Pharmacy Students, Fall 2008. Alexandra, Va: American Association of Colleges of Pharmacy. http://www.aacp.org/resources/research/institutionalresearch/Pages/StudentApplications, EnrollmentsandDegreesConferred.aspx. Accessed March 24, 2010.
15. Hays B. Increasing the representation of underrepresented minority groups in US colleges and schools of pharmacy. *Am J Pharm Educ.* 2008;72(1):Article 14.
16. Missing Persons: Minorities in the Health Professions. A Report of the Sullivan Commission on Diversity in the Healthcare Workforce. Available at: http://minority-health.pitt.edu/archive/00000040/. Accessed March 24, 2010.
17. Simpson JC. Segregated by subject: Racial differences in the factors influencing academic majors between European Americans, Asian Americans, and African, Hispanic, and Native Americans. *J Higher Educ.* 2001;72(1):63-100.
18. U.S. Census Bureau 2006. http://queens.about.com/gi/dynamic/offsite.htm?zi=1/XJ/Ya&sdn=queens&zu=http%3A%2F%2Fquickfacts.census.gov%2Fqfd%2Fstates%2F36%2F36081.html. Accessed March 22, 2010.
19. Willis S, Shannon P, Hassell P. Who will be tomorrow's pharmacists and why did they study pharmacy? *Pharm J.* 2007;277(7410):107-108.
20. Suzuki BH. Education and socialization of Asian Americans: a revisionist analysis of the 'Model Minority' thesis. In: Russell E, Stanley S, Nathaniel W, eds. *Asian-American: Social and Psychological Perspectives, Vol. II.* Palo Alto, CA: Science and Behavior Books; 1988:155-78.
21. Xie Y, Goyette K. Social mobility and the educational choices of Asian Americans. *Soc Sci Res.* 2003;32(3):467-98.
22. Song C, Glick JE. College attendance and choice of college majors among Asian-Americans. *Soc Sci Q.* 2004;85(5):1401-1421.
23. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Pharm Educ.* 1990;53(Suppl.):7S-15S.
24. ACPE Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. Adopted: January 15, 2006; Released: February 17, 2006; Effective: July 1, 2007. Accreditation Council for Pharmacy Education. Chicago, IL: 2006. http://www.acpe-accredit.org/pdf/ACPE_Revised_PharmD_Standards_Adopted_Jan152006.pdf. Accessed January 19, 2009.