A two factor model of performance approach goals in student motivation for starting medical school

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This study explores what motivates a student to enter medical school by first measuring students' strength of motivation and then by looking for relationships between motivation and career-related values and approaches to learning. Validated and reliable questionnaires were used to obtain data. This study found no differences in strength of motivation based on sex, nationality or age, but it did find that the reasons underlying motivation to enter medical school are interrelated and based on interpersonal and intrapersonal factors such as wanting to help people, being respected and successful and fulfilling a sense of achievement. An examination of the data, drawing on correlation and multiple regression analyses, confirmed performance approach and performance avoidance goal structures in first-year medical students. It also yielded a two factor model of the performance-approach goal structure. Students motivated to do better could be driven either by positive self esteem or by perceiving medicine as a means of enhancing their social status. Students who set their own goals and work towards them are more likely to succeed. Future recommendations include investigating if and how students' motivations change over time.

Introduction

Why do so many students apply to medical school every year? What motivates someone to pursue the study of medicine? Despite the expense, long hours and numerous examinations, medical school enrolment increases every year. Medical schools are expected to take in only those who will become fit to practice, but how can this be ascertained at the time of entry? No selection procedure is perfect and it is possible that unsuitable candidates may be selected or that highly suitable students may develop apathetic and unsuccessful attitudes and strategies as they progress through medical school. Individual differences in motivations may be ascribed to differences in personality, values and attitudes. Therefore, this study explores the strength and quality of motivation of students starting medical school, and examines if motivations differed between individuals in terms of their age, sex and nationality, and how they were related to career values and approaches to learning. Examining the strength and quality of motivation for studying medicine serves not only as *post hoc* validation of selection procedures but also gives insight into individual differences which can then be used to inform best medical educational practices.

The setting

The University of the West Indies (UWI) is a regional institution which serves about 5.6 million people throughout the fifteen countries in the Caribbean Commonwealth, stretching from Belize in the north to Trinidad and Tobago in the south. There are three main campuses (Barbados, Jamaica, and Trinidad and Tobago) and centres in all non-

campus countries. The Faculty of Medical Sciences (FMS) on the St. Augustine Campus in Trinidad and Tobago has committed itself to producing health professionals who practise a comprehensive approach to medicine, who can work as effective team members, perform research, and become lifelong learners. The teaching and learning experiences for the MBBS (Bachelor of Medicine/Bachelor of Surgery) students include lectures, seminars, problem based learning and case based tutorials, laboratory activities, skills training, and bedside teaching. Each year, the FMS accepts into the MBBS program about 180 students, from Trinidad and Tobago as well as both within and outside the Caribbean.

Acceptance into medical school is based on academic achievement in high school or beyond. It was not until 2009 that non-academic criteria were introduced. Students come with differing reasons for studying medicine which impact on their achievements and choices. This quantitative study is driven by the questions: How strong is the students' motivation for entering this medical school? What are students' motivations for entering this medical school?

Theories of motivation

Motivation explains why we behave as we do and why we engage in particular actions at particular times (Weiner, 1992). Motivation is the force which starts and sustains our activities towards achieving our goals (Pintrich & Schunk, 2002). There are four major theories of motivation: attribution, expectancy value, self efficacy and goal orientation. The attribution theory of motivation (Weiner, 1985) tells us that we are driven to make sense of our environment, and as we search for causes to events, our perceptions of causes creates a dynamic between our thinking, feelings and actions. Expectancy value theory posits that the amount of effort applied to a task depends upon the expectation of and value placed on success (Pintrich & Schunk, 2002). Self efficacy theory tells us that individuals will set their goals based on their interpretations of past achievements (Schunk, 1991). Goal orientation theories attempt to explain why we pursue achievement tasks and how we view competence and academic success. Within behavioural and social sciences, achievement goal orientation has arisen as the most influential approach to academic motivation (Elliot, 1999).

Achievement goal orientations

Achievement goal theory proposes that students may demonstrate preferences for mastery orientation and performance orientation (Archer, 1994). Mastery goal orientation is based on a desire to increase understanding and is found in environments in which students are valued, and where learning and working hard are important; while performance goal orientation is based on a desire to demonstrate competence and is found in environments which emphasise high ability and doing better than others (Pintrich, Conley, & Kempler, 2003).

Within performance goal orientation, Elliot (1999) makes a distinction between performance approach goals and performance avoidance goals. Performance approach goals refer to an orientation towards demonstrating high ability, whereas performance

avoidance goals refer to an orientation towards avoiding demonstrating low ability. This suggests that students with performance approach goals are positively motivated to try to do better than others, while students with performance avoidance goals are negatively motivated to try avoiding failure or appearing incompetent.

Why students want to study medicine

Upon entering medical school, students give many reasons as to why they chose to study medicine. They want to relieve people's suffering, to save lives, they are interested in science, or they desire the prestige, money, and success which come with the profession (McHarg, Mattick, & Knight, 2007; McManus, Livingston & Katona, 2006; Powell, Boakes & Slater, 1987; Wierenga, Branday, Simeon, Pottinger & Brathwaite, 2003). Students may be motivated to study medicine by a need for personal fulfillment or they feel pressured by family or peers (Urdan & Mestas, 2006).

Previous work has found that students' motivations may be underpinned by their personality and approaches to learning (McManus et al., 2006). Approaches to learning may be described as surface, deep or strategic. A surface approach is driven by a fear of failure; a deep approach is motivated by intrinsic interest, while a strategic approach may be motivated by a need to be successful (Newble & Entwistle, 1986). While having different attitudes to learning, medical students may demonstrate distinct and positively correlated patterns of internal and external motivations, thereby supporting the idea that both sources of motivation are interrelated (Sobral, 2004). As autonomous achievement motivation is positively associated with academic achievement, self regulation and meaningful learning strategies (Arnold & Feighny, 1995; Sobral, 2004), and students' goal structure reciprocally affects their motivation, engagement and achievement (Ames & Archer, 1988), it is important to uncover students' goal structures and learning approaches to help them develop autonomous motivations and strategies and thereby fulfil their potential.

This study draws from achievement goal orientation theory to examine the strength of motivation and the underlying goal structure which motivates students to enter medical school. The purpose of this study is to determine what motivates a student to enter medical school by first measuring students' strength of motivation and then by examining relationships between motivation to enter medical school and career related values and approaches to learning.

Methods

Participants

The participants consisted of first year medical students enrolled in 2007-2008 in the Faculty of Medical Sciences at the University of the West Indies (UWI) St Augustine campus. There were 86 females and 30 males ranging in age from 18 to 37 years. Their countries of origin were Trinidad and Tobago, Jamaica, Barbados, St Lucia, St Vincent & the Grenadines, Dominica, Bahamas, Belize, USA, Canada and Botswana.

Procedure

During orientation week, first time students were asked to complete three self rating questionnaires: a) the *Approaches and study skills inventory for students* (ASSIST), (Tait, Entwistle & McCune, 1998); b) Murdoch, Kressin, Fortier, Giuffre & Oswald's (2001) questionnaire measuring medical students' career related values and c) a questionnaire to measure the strength of motivation for entering medical school (SMMS) (Nieuwhof, ten Cate, Oosterveld, & Soethout, 2004). Students were assured that their responses would be kept confidential. They were asked to respond truthfully and quickly and not spend too much time on each item.

Measures

The ASSIST is a 64 item questionnaire measuring student approaches to learning in higher education (Tait, Entwistle, & McCune, 1998). The ASSIST scale includes fifteen sub-scales which combine to define three approaches to learning: deep, strategic and surface. Murdoch et al's (2001) career related values inventory has 46 items and includes seven sub-scales: bioscientific orientation, biosocial orientation, academic interest, prestige, income, avoid role strain and role support. The SMMS (Nieuwhof, et al, 2004) is a 16 item questionnaire measuring the strength of motivation for entering medical school. Included in the instruments were questions asking participants to provide their age and sex.

Analyses

Statistical analyses and summaries were generated using departmental records and the statistical package *SPSS 12.0*. Independent samples t-test and analysis of variance (ANOVA) were used to test for differences in motivation based on sex, age, nationality and approaches to learning. Pearson's correlation was used to test for relationships between motivation, career related values and approaches to learning. Finally, standard multiple regression analysis was used to identify variables which impact upon motivation to study medicine.

Results

Of the possible 209 first year medical students, 116 (56%) returned all three surveys. In a population where 68% of the students were female and 32% were male, 86 females (74%) and 30 males (26%) were participants in the study. The modal age was 19 years (mean=20; SD = 3; median = 19; range 18 – 37), with only 21% being 22 years of age or older. 85 (73%) of the participants were from Trinidad and Tobago, 25 (21%) were from other Caribbean islands and 6 (5%) were from the USA, Canada and Botswana.

Reliability coefficients as measured by Cronbach's alpha for SMMS, career related values and strategic learning were above 0.80. Cronbach's alpha for surface learning was 0.77 and for deep learning was 0.70. These high values attest to the reliability of the scales.

The mean score on the SMMS was 63.0 with a standard deviation of 9.0. This represented strong motivation to study medicine. Independent samples t-tests and ANOVA revealed that there were no significant differences between the mean scores on the SMMS based on age, sex, nationality or approaches to learning. The following significant differences in means are worth mentioning. On one item of the SMMS scale, females scored significantly and moderately lower than males (eta squared =.04): "As soon as I would discover that it would take me ten years to qualify as a doctor, I would stop studying." In addition, females scored significantly higher than males in their fear of failure approach to learning (eta squared =.06).

The relationships between students' strength of motivation and career related values and approaches to learning were small to moderate as shown in Table 1. Motivation to study was significantly and positively associated with prestige and deep and strategic approaches to learning and negatively associated with income, avoidance of role strain and surface approach to learning. At the level of significance where $p < .05$, academic interest, role support and bioscientific and biosocial orientations to medicine were not significantly related to motivation.

Table 1: Pearson's correlations between strength of
motivation (SMMS) and other measures

Item	Pearson's correlation	Significance
Strategic approach to learning	.366**	0.000
Prestige	.298**	0.001
Deep approach to learning	.295**	0.001
Biosocial orientation to medicine	.181*	0.051
Academic interest	0.034	0.721
Bioscientific orientation to medicine	-0.081	0.388
Role support	-0.135	0.147
Income	-.245**	0.008
Surface approach to learning	-.275**	0.003
Avoid role strain	-.317**	0.001

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed).

Besides the correlations shown in Table 1, some variables within the three approaches to learning were significantly correlated with motivation to study medicine. In order to study how motivation related to other variables, standard multiple regression was used to identify the most important predictors of motivation to study medicine. Motivation scores were regressed on the three approaches to learning: surface, deep and strategic along with career related values and are summarised in Tables 2, 3 and 4, respectively. Inspection of scatter-plots supported the assumption that relationships between variables were linear. The three tables yield three models for motivation to study medicine.

In the first model, motivation for studying medicine was kept constant while values and surface approach to learning were independent variables. Table 2 displays the correlations

between variables, the unstandardised regression coefficients (B) and intercept, the standardised regression coefficient (beta), the semi-partial correlations and R=.593, R^2= .352 and R^2 adjusted = .317. R for regression was significantly different from zero, $F_{(6, 115)}$=9.878, p<.05. This table shows that there were six independent variables which contributed significantly to motivation to study medicine and predicted about 32% of variability in motivation.

Table 2: Regression coefficients for surface learners

Model 1	Unstandardised coefficients		Standardised coefficients		
	B	Std. Error	Beta	t	p
(Constant) SMMS	52.245	6.025		8.672	.000
Surface approach	-.392	.106	-.424	-3.708	.000
Avoid role strain	-.570	.124	-.380	-4.589	.000
Prestige	.341	.122	.231	2.787	.006
Biosocial orientation	.317	.156	.166	2.034	.044
Alertness to assessment	.589	.250	.191	2.354	.020
Fear of failure	.683	.246	.316	2.773	.007

Table 3 presents the second model which was generated by using values and deep approach to learning as independent variables. The table displays the correlations between variables, the unstandardised regression coefficients (B) and intercept, the standardised regression coefficient (beta), the semi-partial correlations and R=.594, R^2= .353 and R^2 adjusted = .329. R for regression was significantly different from zero, $F_{(4, 115)}$=15.111, p<.05.

Table 3: Regression coefficients for deep learners

Model 2	Unstandardised coefficients		Standardised coefficients		
	B	Std. Error	Beta	t	P
(Constant) SMMS	23.383	8.428		2.774	.006
Deep approach to learning	.225	.103	.174	2.183	.031
Prestige	.333	.120	.226	2.772	.007
Avoidance of role strain	-.522	.116	-.348	-4.507	.000
Achieving	1.333	.330	.318	4.039	.000

As Table 3 shows, there were four independent variables which contributed significantly to motivation to study medicine. Altogether about 33% of variability in motivation was predicted by knowing scores on the four independent variables.

Table 4: Regression coefficients for strategic learners

Model 3	Unstandardised coefficients		Standardised coefficients		
	B	Std. Error	Beta	t	p
(Constant) SMMS	44.677	6.749		6.619	.000
Strategic approach to learning	.252	.065	.294	3.844	.000
Avoidance of role strain	-.340	.135	-.226	-2.517	.013
Prestige	.451	.117	.306	3.849	.000
Lack of purpose	-.755	.230	-.259	-3.276	.001
Income	-.243	.114	-.205	-2.134	.035

Table 4 presents a model for strategic learners and displays the correlations between variables, the unstandardised regression coefficients (B) and intercept, the standardised regression coefficient (beta), the semi-partial correlations and R=.667, R^2= .444 and R^2 adjusted = .419. R for regression was significantly different from zero, $F(5, 115)=17.599$, p<.05.

As Table 4 shows, there were five independent variables which contributed significantly to motivation to study medicine. Altogether about 42% of variability in motivation was predicted by knowing scores on the five independent variables.

Discussion

Overall, the results from this field study offer two main contributions to the literature: a) empirical evidence favouring a two-factor model of performance goal orientation and b) insight into factors which motivate performance-oriented students to study medicine.

There are different types of motivation leading to different outcomes even when the level of motivation is high. As did previous work (Murdoch et al., 2001), this study found that motivation to study medicine as determined by the SMMS scale was strong in this cohort of first year students. There was no significant difference in strength of motivation based on age, sex, nationality or approach to learning.

Other studies have found that males were more likely to pursue medicine for the prestige (Wierenga et al., 2003) and the income (Greenhalgh, Seyan, & Boynton, 2004), but these findings were not supported in this study. However, fear of failure was more important to females than males. Females had a slightly stronger motivation to pursue medicine and would be willing to spend extra time doing so, although fear of failing and a lack of support would inhibit their motivation (McHarg et al., 2007).

There were two variables which correlated negatively and significantly with motivation to study: income and avoidance of role strain, while prestige correlated positively with motivation. This compared with other studies which found reasons behind motivation to

include prestige, respect, helping others and interest in science (McManus et al., 2006; Wierenga et al., 2003). In both sexes, the stronger their motivation to study medicine, the less likely they were interested in pursuing medicine for the money or the status it brings and the more altruistic their reason for beginning their career.

The deep and strategic approaches to studying dominated this sample. Other work has found that females tend to score higher on the deep approach and males on the surface approach (Mattick, Dennis, & Bligh, 2004), however, that was not confirmed in this study. Previous work has also found more surface learning in younger students (Aaron & Skakun, 1999), but this too was not confirmed. In fact, the surface learning strategy of unrelated memorising was higher in students aged 22 years or older.

The results of this study suggest that there are different types of motivation for studying medicine. Other studies have confirmed three goal orientations of mastery, performance, and alienation (Archer, 1994; Perrot, Deloney, Hastings, Savell, & Savidge, 2001). Only performance goal orientation was supported in this study.

The results of the linear regressions suggest that there are two goal structures at work here: performance approach and performance avoidance. Urdan & Mestas (2006) found interpersonal, intrapersonal and ambiguous reasons for the pursuit of these types of goals, and that the same reasons could appear across both types of goals. Model 1 in Table 2 speaks to a performance avoidance goal structure. The correlations of prestige, biosocial orientation, and alertness to assessment demands are low but positively associated with motivation to study. Prestige refers to the value placed on competitive and intellectual achievement (Murdoch et al., 2001). Surface learning and avoidance of role strain correlate negatively with motivation. Surface learning is predominantly motivated by a fear of failure which in turn promotes superficial learning. This model suggests an apathetic approach to learning unmotivated by helping others and the demands of the work and unwillingness to invest time and energy needed to study medicine.

In contrast, the other two models speak to two performance approach goal structures. In both cases, a deep or strategic approach to learning is positively correlated with motivation to study medicine while avoidance of role strain is negatively correlated with motivation. This suggests that learners with a deep or strategic approach possess a desire to demonstrate competence. In Model 2, prestige and positive self motivating thoughts are also positively correlated with motivation. In Model 3, prestige positively correlated with motivation while income and lack of purpose are negatively associated with motivation. Model 2 suggests more intrapersonal reasons (of pride and self esteem) for performance approach goals as would be expected with a deep approach to learning, while Model 3 suggests more interpersonal reasons of social comparison and status (Urdan & Mestas, 2006) as evidenced in strategic learners

In the performance oriented student, achievement motivation may be high, but without the intrinsic interest, strategic or surface approaches may be adopted (Tan & Thanaraj, 1993). Fear of failure, lack of confidence and a surface approach impact negatively on academic achievement (Mayya, Rao, & Ramnarayan, 2004). Performance oriented students

tend to be younger and worry more about failure and gaining approval. Intrinsic goal framing results in better conceptual learning and enjoyment of learning than extrinsic goal framing which predicts pride, anxiety and a strategic and sometimes narrow approach to learning (Pekrun, Elliot, & Maier, 2006; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Mastery orientation and its subsequent enjoyment and involvement with material sometimes come with age and experience (Bye, Pushkar, & Conway, 2007; Harju & Eppler, 1997).

Conclusion

The reasons for entering medical school are wide ranging and can be explained in terms of personality, attitudes, values, and experiences. This study found that on entry, students' motivation to study medicine was high and did not differ between the sexes, nationalities, or for those above or below 22 years of age. Selecting students on academic requirements only may result in choosing candidates unsuited to medicine; therefore examining their strength and quality of motivation for studying medicine serves as *post hoc* validation of selection procedures.

The findings of this study support only performance goal orientation in these students and suggest that first year students perceive medical school as an environment in which they need to do better than others. The goal structures of performance approach and performance avoidance were confirmed in this study. Performance avoidance students could be defined by their surface approach to learning, fear of failure, lack of desire to engage in long term care of patients and need to limit difficulties in fulfilling their perceived obligations as would be physicians. Performance approach students could be defined by their deep or strategic approach to learning, the value they placed on intellectual achievement and their lack of worry about fulfilling their perceived obligations as would-be physicians. This study also yielded further information on underlying motivations for performance oriented students. Students positively motivated to do better than others could be driven either by positive self esteem or by perceiving medicine as a means of enhancing their social status.

Generalising the findings of this study to other settings is limited as only students from one medical school were surveyed. The study also relied on students' self ratings of their approaches to learning, career related values and motivations to enter medical school. Other instruments besides the ones used in this study have been used to ascertain achievement goal orientation. Nevertheless, this study generated goal structures independent of these measures using scales with high reliability indices.

Students with approach goals are less likely to engage in task avoidance behaviour and more likely to achieve their goals. Students who set their own goals and work towards them are more likely to succeed. Present day selection processes should be modified to include measures of motivations to study medicine. Students' motivations for studying medicine impact on their well being and performance. Investigating if and how motivations change as students progress through medical school is worthy of future study.

Acknowledgments

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