

Applying Self-Determination Theory to Understand the Motivation for Becoming a Physical Education Teacher

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Abstract

This study explored the reasons people choose physical education teaching as a profession and investigated the relationship of these choices with motivation. Physical education pre-service teachers ($n=324$) completed the Academic Motivation Scale (AMS) and a measure of reasons for choosing physical education teaching. Confident interpersonal service reasons were linked with intrinsic motivation; whereas sport and physical activity reasons were related to extrinsic motivation. Enrolling because teaching seemed easy was linked with amotivation. Motivation was similar for different course entry methods, however, females were more intrinsically motivated than males and third year students were lower in motivation than other year levels.

Keywords: extrinsic motivation, intrinsic motivation, self-determination theory, pre-service teachers, physical education

1. Introduction

Previous research has revealed that teachers who are self-determined, that is, intrinsically motivated in their teaching are more likely to support students' autonomy, and this in turn leads to greater intrinsic motivation amongst students (Pelletier, Seguin-Levesque, & Legault, 2002; Reeve, Bolt, & Cai, 1999). Intrinsic motivation may, therefore, be viewed as a valuable commodity among teachers, as it is associated with several desirable outcomes; particularly, in relation to academic achievement such as greater creativity, flexibility, spontaneity, enjoyment, quality of work, increased attention, persistence and study skills (Amabile, 1985; Deci & Ryan, 1985; Koestner, Ryan, Bernieri, & Holt, 1984; Lepper, 1994; Poonam, 1997; Hidi & Harackiewicz, 2000). Intrinsic motivation is also positively correlated with achievement (Krapp et al, 1992). Whilst research has addressed teacher motivation and its effects, there exists far less work exploring motivation of student teachers, particularly the evolution of their motivational characteristics during their studies (Malmberg, 2006). The scarcity of work exploring the development of motivational characteristics specific to physical education student teachers is greater still.

Intrinsic motivation for an activity is displayed when the activity is undertaken out of interest, enjoyment, or inherent satisfaction (Ryan & Deci, 2002; Vallerand & Ratelle, 2002). Intrinsic motivation may be broken into three parts, intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation, listed in order of decreasing self-determination (Vallerand et al., 1992). Intrinsic motivation *to know* refers to a need or desire to understand and learn. Intrinsic motivation *toward accomplishments* regards behaviour undertaken to gain a sense of achievement and capability, and intrinsic motivation *to experience stimulation* involves participating in an activity for pleasure or sensations that will be felt.

Extrinsic motivation, on the other hand, relates to activities undertaken for reasons other than inherent interest in the activity (Deci & Ryan, 1985, Vallerand & Ratelle, 2002). Extrinsic motivation is classified as integration, identification, introjection, and external

regulation. *Integrated regulation* of extrinsic motivation is an activity recognised as worthwhile and is integrated into the person's behaviour as a means to an end rather than for intrinsic pleasure. Moving down the continuum, *identified regulation* describes situations in which individuals compel themselves to undertake an activity because they identify that an activity is worthwhile for some reason (Petrie & Govern, 2004). *Introjected regulation* is governed by rewards and restrictions implemented by the individual themselves, whereas in *external regulation*, the rewards and restrictions are implemented by others (Vallerand, et al. 1992). Externally regulated extrinsic motivation is the lowest type of motivation on the self-determination continuum. The lack of any self-determination is called amotivation (Deci & Ryan, 1985).

Several studies (Pooley, 1972; Dewar & Lawson, 1984; Templin, Woodford, & Mulling, 1982; Hutchinson, 1993) have sought to identify reasons people wish to become physical education teachers, but these have all been primarily concerned with the socialisation process rather than motivation development (Richardson & Watt, 2006; Moreira, Fox, & Sparkes, 2002; Belka, Lawson, & Lipnickey; 1991; Dewar, 1989; Dewar & Lawson, 1984). Socialisation studies were mainly concerned with collecting reasons for choosing the physical education profession, and labelling these as motivations. For example, Richardson and Watt (2006) developed the FIT-Choice framework to identify motivations for choosing education in general. This framework moves from identifying psychological mediators to behavioural outcomes. In leaving out the psychological concept of motivation, however, the model's explanatory power may be compromised. In contrast, Vallerand's (2000) hierarchical model for self-determination theory proposes that social factors impact psychological mediators; which in turn impact motivation; which finally impacts behavioural outcomes. This provides a framework for not only identifying motivational factors, but analysing the affect these have on intrinsic motivation, extrinsic motivation and amotivation. The framework also provides for the examination of the consequences of different types of motivation.

Motivation for teaching physical education is rarely measured according to self-determination theory, despite its continued development, and few have identified the development of motivational characteristics specific to physical education student teachers. Moreira, Fox, and Sparkes (2002) cited the need for “a more comprehensive view of the motivation of physical educators in the context of their work and their career development” (p. 846). Therefore, this study collates and measures reasons for choosing teaching physical education as a career and integrates them with Vallerand’s (2000) concept of self-determined motivation to study physical education. Identifying student choices and motivation behind teaching is important for understanding motives for undertaking a physical education degree, the findings of, which could be used to influence teaching practices and the development of course components. Specifically, the findings of this study may help to encourage the development of educational strategies to develop intrinsic motivation among students to teach physical education. Intrinsic motivation can be developed by increasing perceptions of success and competence such as involving participants in decision making, providing feedback and setting realistic goals (Swanson, 1995; Watts, Cashwell & Schweiger, 2004). Developing intrinsic motivation among pre-service teachers is also important from the perspective of teacher recruitment, particularly since teaching is a profession struggling to attract and maintain new graduates, with an estimated attrition rate of 30% for early career teachers (eg., within 3 years of commencing work) (O’Brien & Goddard, 2006).

Specifically, this study aims to: 1) identify the social and psychological mediators behind student choices for becoming a physical education teacher; 2) explore the relationship of social factors and psychological mediators to motivation, 3) identify which factors are the strongest predictor for motivation; and 4) examine the motivational difference between gender, year levels, second teaching method, and course entry. A second teaching method refers to the alternative teaching disciplines other than physical education that a pre-service teacher is training in and includes English, health, information technology, mathematics,

science or society and environment.

2. Motivation to teach

A wide range of factors bring about the decision to become a teacher (Lortie, 1975). Seven attractors in choosing physical education have been identified from the literature. Five are based on Dewar and Lawson's (1984) revision of Lortie's (1975) broader concepts, while the sixth and seventh attractors were identified by Lawson (1983a). The attractors are: interpersonal, service, continuation, time compatibility, material benefits, desires to be physically active, and the desire to coach sport (Hutchinson, 1993). All of these attractors can be understood in terms of Vallerand's (2000) hierarchical model as psychological mediators that relate to the fulfilment of particular needs, hence their attractiveness, except for service. The desire to serve the community is better explained as an affective psychological consequence of motivation arising from various social factors and mediators. As for the attractors, interpersonal reasons concern the desire to work in a people focused occupation; continuation is the wish to remain in the school system; and time compatibility is the want for a job delivering adequate time for personal pursuits (Dewar & Lawson, 1984). Material benefits relate to job security (Dewar & Lawson, 1984). This is in conflict with Richardson and Watt's classification of job security being an intrinsic value rather than an extrinsic task return, based on expectancy-value theory. Dewar and Lawson's (1984) definition is more closely aligned with the self-determination motivation literature (Petrie & Govern, 2004). The desire to be physically active is sparked by distaste for sedentary work (Lawson, 1983a); and the desire to coach sport reveals the use of the profession as a means to an end. People with this desire typically endure the physical education teaching component of the job for their preferred activity, which is coaching sport (Hutchinson, 1993; Lawson, 1983a). This is especially true in the USA, where a greater emphasis is placed on school sport than in Australia.

Subjective warrant, identification with teachers, family continuity, and blocked aspirations

are cited as facilitating factors for individuals' entry into physical education (Templin, Woodford, & Mulling, 1982). Except for the subjective warrant, the other three facilitators may be viewed as contextual social factors under Vallerand's (2000) hierarchical model. People who identify with teachers choose physical education teaching as a profession to either emulate a good teacher or be the antithesis of a bad teacher with whom they identify (Templin, Woodford, & Mulling, 1982). Those who have teachers in their family and subsequently become teachers are said to have been at least partially facilitated into teaching through family continuity, and people who become physical education teachers because they could not meet the demands of their preferred career do so due to their blocked aspirations (Templin, Woodford, & Mulling, 1982). The subjective warrant is like a combination of Richardson and Watt's (2006) concepts of task demand with self perceptions. A strong subjective warrant means individuals believe they are equipped to cope with the demands of a physical education teaching (Templin, Woodford, & Mulling, 1982), and, as such, this fits best into Vallerand's (2000) hierarchical model as a psychological mediator addressing the need for (perceived) competence.

3. Method

3.1 Participants

Students enrolled in a four-year Bachelor of Education (Physical Education) (BEPE) degree at a regional university were invited to participate in this study ($n=372$). A total of 324 students agreed to participate, representing an overall response rate of 86.3%. Completed questionnaires were received from 158 (49.1%) male and 164 (50.9%) female respondents aged between 18 and 38 years (20.56 ± 2.2). When separated by year level, 99 (30.8%) were first year, 90 (28.0%) were second year, 72 (22.4%) were third year, and 60 (18.7%) were fourth year students. As a component of the BEPE degree these students were required to select a second teaching method from one of six options: English ($n=46$; 14.6%), health ($n=91$; 28.8%), information technology ($n=24$; 7.6%), mathematics ($n=58$; 18.4%),

science ($n=58$; 18.4%), and studies of society and environment (SOSE: $n=39$; 12.3%). The majority of students entered the course directly from high school ($n=193$; 60.3%). Other students had taken a one or two year gap since completing high school ($n=70$; 12.9%), transferred from another university course ($n=23$; 7.2%), or were mature age or career change students ($n=27$; 8.4%) before entering the course. Seven students (2.2%) did not fit these categories.

3.2 Measure

A questionnaire was used to measure demographic information, intrinsic motivation, extrinsic motivation, and amotivation, along with the factors believed to influence the decision to become a physical education teacher. Students were asked to indicate their gender, age, current year level, second teaching method, and method of entry into the BEPE degree. Seven options were provided as methods of entry: direct entry from high school, entry after taking a gap of one or two years following high school, internal transfer from another degree, external transfer from another degree, career change, mature age, or 'other,' with space to specify.

The Academic Motivation Scale (AMS) developed by Vallerand, et al. (1992) was used as a measure of intrinsic, extrinsic and amotivation for going to 'college,' or in Australian terminology, 'university'. The AMS consisted of 28 Likert scale questions relating to intrinsic motivation (to know, toward accomplishment, to experience stimulation), extrinsic motivation (identified, introjected, external regulation) and amotivation. Participants were asked to indicate to what extent the question correspond to one of the reasons why they go to university/college (*does not correspond at all*) to 7 (*corresponds exactly*).

Attractors and Facilitators for Physical Education (AFPE) measured the relationship of social factors and psychological mediators to motivation. The AFPE questionnaire consisted of 44 seven-point Likert questions based on seven attractors (interpersonal

reasons, service reasons, desire to coach sport, desire to be physically active, continuity, material benefits, and time compatibility) and four facilitators (identification with teachers, family continuity, the subjective warrant, and blocked aspirations). The attractors and facilitators were identified and expounded by various researchers (Pooley, 1972; Templin, Woodford, & Mulling, 1982; Dewar & Lawson, 1984; Hutchinson, 1993; Richardson & Watt, 2005), and were placed into Vallerand's (2000) framework (Table 2). All 44 questions related to the global question "*why do you want to become a physical education teacher?*" For example, participants were asked to indicate how much they agreed on a scale of 1 (*not at all*) to 7 (*exactly*) with: "Because I will enjoy working in the school setting" (interpersonal reasons); "Because physical educators play an important role in serving the school community" (service reasons); "Because I want physical activity to be part of my job" (sport and physical activity); "I really wanted to do something else, but physical education was an easier and safer option" (low perceived demand); "I was inspired by good teachers I've had" (role model); or "Because there are or were teachers in my family" (family).

3.3 Procedure

All students studying the BEPE degree were invited to participate in this study during tutorials early in second semester, July – Dec 2006. Participants received a plain language statement that informed them that participation was voluntary, and that their consent was implied by the return of the completed questionnaire. Participants were instructed to complete the questionnaire honestly, without deliberating over selections too long, and a researcher was present to clarify any questions. The questionnaire took no longer than twenty minutes to complete. The University's Human Research Ethics Committee (HREC) granted ethical approval for this study.

3.4 Data Analysis

Cronbach's alpha coefficients were calculated for each of the AMS sub scales. The AMS returned adequate internal consistency with all sub-scales ranging from 0.72 to 0.86s, barring the extrinsic motivation (identified) sub-scale which returned 0.62 (Table 1). These results were similar to those found by Vallerand et al. (1992), who reported that all AMS sub-scales also displayed acceptable temporal stability with an average test-retest correlation of 0.79 during a period of one month.

Analyses of variance were used to determine if there were any significant differences in motivation between gender, year levels, or second teaching methods. Where significant differences were found, post hoc tests were employed to further investigate the nature of those differences. An independent samples t-test was carried out to test if the motivation of students entering the degree directly from high school was significantly different to students who entered the course in a different manner.

A factor analysis was conducted on the AFPE to identify the main reasons behind student choices for becoming a physical education teacher. Pearson correlations were calculated between the factors identified for wanting to become a physical education teacher and the seven motivation sub-scales of the AMS. The intention was to discover which factors were the most highly associated with the various types of motivation. Forward linear regressions were conducted using the components derived from the factor analysis to investigate if the resulting models could predict any of the variability in motivation.

4. Results

The cohort of BEPE students returned high to moderate scores for extrinsic motivation (identified: 5.45 ± 0.95 , interjected: 4.08 ± 1.27 , external regulation: 4.62 ± 1.16); moderate for intrinsic motivation scores (to know: 4.81 ± 1.00 , toward accomplishment: 3.97 ± 1.14 , to experience stimulation: 2.84 ± 1.05), and a low amotivation score (1.65 ± 0.93). The maximum possible score for any subscale was seven.

The 44 items from the AFPE questionnaire were analysed for factors using unweighted least squares factor analysis. A scree plot was carried out to aid in factor selection, and as a result, five factors were chosen and rotated using the Varimax rotation procedure. The rotated solution produced five factors: confident interpersonal service, sport and physical activity, low perceived demand, role model, and family. These factors accounted for 23.3%, 8.7%, 8.0%, 5.9%, and 4.8% of the item variance respectively. Fourteen items loaded on more than one factor. Sport and physical activity (6.03 ± 0.75), role models (5.29 ± 1.36), and competent interpersonal service (5.15 ± 0.86) received high scores; whilst low perceived demand (3.11 ± 0.85) and family (2.07 ± 1.64) had lower scores. The maximum possible mean score for any factor is seven.

3.1 Relationship between the AFPE factors and the AMS measures of motivation

Table 3 presents the results of Pearson correlations carried out to investigate whether any of the five factors identified for choosing physical education teaching were related to any of the seven motivation sub scales measured by the AMS. These results indicated that only family was not significantly related to motivation.

3.2 Factors predicting motivation

Forward linear regression analyses were carried out to evaluate how well the five components 'confident interpersonal service', 'sport and physical activity', 'low perceived demand', 'role models', and 'family' predicted levels of motivation. The null hypothesis that none of the variables were related to the five factors was rejected in each model, with the F-tests returning values of $F(1,321) = 54.56$, $p < 0.001$, $F(3,319) = 23.47$, $p < 0.001$, and $F(3,319) = 14.90$, $p < 0.001$ for intrinsic motivation, extrinsic motivation, and amotivation respectively. Bivariate and partial correlations, along with B , $SE B$, and β for each of the models are reported in Table 4.

The intrinsic motivation model returned a small ($R^2 = .14$) but significant effect size. The standard error of the estimate was 0.82. Confident interpersonal service was the sole predictor used in the model. The results of the linear regression suggested that confident people who chose to become physical education teachers for interpersonal service reasons were more likely to be intrinsically motivated.

The model with the largest effect size ($R^2 = .18$) was that predicting extrinsic motivation. The standard error of the estimate (0.76) was slightly lower than that of the intrinsic motivation model. Sport and physical activity was the first predictor used, then low perceived demand was added, and the third and final predictor for the model was confident interpersonal service. Adding these predictors produced R^2 changes of .05 and .03 respectively. These linear regression results seem to indicate that all three predictors made a similar contribution in predicting extrinsic motivation.

The third model was for amotivation, and returned the lowest effect size ($R^2 = .12$) and the highest standard error of the estimate (0.88). The same three predictors used for the final extrinsic motivation model were used for the amotivation model, although they were entered in a different order. Competent interpersonal service was the first predictor entered, then adding low perceived demand and sport and physical activity improved the model by changes in R^2 of .04 and .01 respectively. The results of this linear regression suggested that people who enter physical education teaching for confident interpersonal service reasons or sport and physical activity reasons were less likely to be amotivated. Conversely, those who enter physical education teaching because they perceive it has low demands were more likely to experience amotivation.

3.3 Course Entry

There were no statistically significant differences for any type of motivation between students entering the course directly from high school and students entering the course

through other methods (Table 5).

3.4 Gender

In general, females returned higher scores for all motivation types except for amotivation (Table 6). Independent samples t-tests revealed significant differences between males and females for intrinsic motivation to know, and intrinsic motivation toward accomplishment.

3.5 Second Teaching Method

Across all second teaching methods, intrinsic motivation to know, extrinsic motivation (identified and external regulation) returned high scores (Table 7). A one way ANOVA revealed a significant difference for extrinsic motivation (external regulation), between the groups $F(5, 310) = 3.423, p = 0.005$. However, Tukey's post hoc test for honestly significant differences failed to find any significant differences.

3.6 Year Levels

The only motivational construct that returned a statistically significant difference for motivation by year level (at the $p < 0.01$ level) as a result of one way ANOVA was amotivation (Table 8). Amotivation scores were quite low for all year levels. The Levene statistic ($L(3, 316) = 7.082, p < 0.000$) for amotivation indicated that the assumption of homogeneity of variance between groups had been violated, so Tamhane's statistic was chosen for post hoc testing. Third year students were shown to have significantly higher levels of amotivation than first, second, and fourth year students.

5. Discussion

Previous research on physical education teachers' motivation identified social factors

and some psychological mediators behind motivation, measuring the connection between social factors with the choice of teaching as a career (Dewar & Lawson, 1984; Hutchinson, 1993; Richardson & Watt, 2005; Richardson & Watt, 2006). This helped identify strategies for improving recruitment, induction, and retention to ensure teacher quality. This study builds on previous research by investigating reasons and motivations to teach physical education using self-determination theory, with a particular focus on pre-service physical education teachers during their course of study. This is an important focus of research in terms understanding student choices and motives.

The first aim of this study was to identify the reasons behind student choices for becoming a physical education teacher. Five factors were identified and included confident interpersonal reasons, sport and physical activity, low perceived demand, role model, and family. For example, students were most likely to become physical education teachers because they enjoyed working in a school setting and wanted sport and physical activity to be part of their job. This is consistent with previous research, whereby, people desire to work in a people focused occupation (Dewar & Lawson, 1984) enjoy working within a school setting; whilst people with a desire for a sport-related job typically endure the physical education teaching component of the job for their preferred activity, which is coaching sport (Hutchinson, 1993; Lawson, 1983a).

The second and third aims of the study were to explore the relationship of social factors and psychological mediators to motivation and identify which factors were the strongest predictor for motivation. In general, Pearson Correlations between motivational components measured by the AMS and factors for choosing PE teaching using the AFPE produced weak to moderate positive associations. These findings revealed that students who chose the physical education teaching profession for interpersonal service reasons were more likely to be intrinsically motivated and this may be related to best professional performance (Pelletier, Seguin-Levesque & Legault, 2002; Reeve, Bolt, & Cai, 1999). On the other hand, students who entered the course because of sport and physical activity reasons

were more likely to be extrinsically motivated and those who were inspired by positive teaching role models were likely to display a range of intrinsic and extrinsic motivational characteristics. Students who chose the course for confident interpersonal service, sport and physical activity, and role model reasons were unlikely to be amotivated. Choosing the profession because it has low perceived demands, however, was more likely to result in extrinsic motivation and amotivation, at the lower end of the self-determination continuum. Understanding the relationship between goal orientation and motivation may, therefore, be important for long-term teacher motivation in physical education. Malmberg (2006) found relationships between (i) mastery goals and intrinsic motivation and (ii) avoidance goals and extrinsic motivation among teacher applicants and student teachers specializing in handicrafts, home economic, primary school teaching and special education teaching in Finland. Mastery goals refer to a student's goal to learn, develop, or acquire competence and have been related to self-efficacy, interest, enjoyment and intrinsic motivation (Church, Elliot, & Gable, 2001). In contrast, performance avoidance goals are defined as the orientation towards avoiding unfavourable judgments of lack of competence (Elliot, 1999). Future research could explore whether these relationships are evident amongst pre-service physical education teachers.

The regression models only accounted for between 11.5% and 18.0% of variation in different types of motivation, however, their statistical significance is encouraging. According to Vallerand's (2000) hierarchical model, motivation may be effected by a variety of global, contextual, and situational factors. A wide range of potential personal situations and circumstances have not been considered, all of which could impact autonomy, perceived competence, and relatedness. Examples of such situations and circumstances are physical injuries, psychological scars, death or illness among friends or family, and the current climate of the job market. Despite the small amount of variance explained by the models, it is still clear that choosing physical education for confident interpersonal service reasons is a partial predictor of intrinsic motivation and extrinsic motivation, as well as a predictor for lower levels

of amotivation. Low perceived demand reasons and sport and physical activity reasons are both involved in predicting extrinsic motivation because by definition they describe people who choose the profession for external benefits. The negative coefficients for sport and physical activity and confident interpersonal service reasons for the amotivation model make sense, because people who have both intrinsic and extrinsic reasons for their choice of profession are unlikely to suffer a lack of motivation.

Finally the study aimed to examine the motivational differences between gender, year levels, second teaching method, and course entry. Statistical analysis revealed no significant differences in the motivation of students entering the course directly from high school and that of students entering by other means. Similarly, there were no significant differences in the motivation of students from different teaching methods. Females were found to be significantly more intrinsically motivated than males in two separate measures of intrinsic motivation. The higher intrinsic motivation of females is difficult to explain, and may be due to females experiencing greater relatedness during their time at university, but this is only speculation. Motivation between year levels was mostly constant, except for third year students, who were shown to be significantly more amotivated than every other year level. The greater amotivation of third year students could be due to university burnout occurring without the benefit fourth year students have of seeing an escape. Individuals that are amotivated experience feelings of incompetence and lack of control (Weinberg & Gould, 2003). This may indicate a need to implement strategies to increase perceptions of success and competence amongst third year students, as well as, a focus for research in this area. The findings are further discussed across five themes: internal consistency of AMS, definitions, self-determination continuum, and models.

4.1 Internal Consistency of AMS

Internal consistency conducted on the AMS largely agreed with the results of more rigorous tests carried out by Vallerand et al. (1992), with most subscales proving reliable.

The extrinsic motivation (identified) subscale was slightly problematic, returning a lower Cronbach's alpha than the other values, as was the case in Vallerand et al.'s (1992) findings. Of slight concern was the marginally lower than expected Cronbach's alpha returned for the extrinsic motivation (external regulation) scale, but overall, the reliability of the AMS was considered sufficient.

4.2 Definitions

Intrinsic motivation relates to activities undertaken due to inherent interest and satisfaction (Deci & Ryan, 1985, Vallerand & Ratelle, 2002). For this reason, it is pleasing that the strongest relationships found with intrinsic motivation were with the confident interpersonal service reasons. Of the five factors, this is the one that is least selfless and certainly suggests a degree of all three psychological mediators described by Vallerand (2000). Confidence in one's teaching ability fulfils the competence mediator, interpersonal reasons suggest strong relatedness, and service suggests a feeling of autonomy in being able to choose a profession that is appealing. In light of these definitions, the finding that confident interpersonal service reasons were most closely correlated with intrinsic motivation is supportive of self-determination theory.

Extrinsic motivation is characterised by behaviour carried out to achieve external benefits (Deci & Ryan, 1985, Vallerand & Ratelle, 2002). The sport and physical activity component is a good example of this, as although the student enjoys playing sport and being physically active, these characteristics are external benefits provided by the job of teaching physical education. For this reason, it would be expected that as found, correlations would be strongest with extrinsic motivation. A slightly surprising outcome is that the sport and physical activity factor was significantly related to the highest level of intrinsic motivation. This may be due to sporty people feeling autonomous because they are choosing a profession allowing them to be active and competent because they are good at sport. Even so, this does not explain why there is a significant relationship between intrinsic motivation to

know and virtually no relationship with the other intrinsic motivation sub scales.

According to self-determination theory, the less self-determined behaviour is perceived to be, the less motivation will result. Low perceived demand was the only factor to be positively related to amotivation. If someone chooses teaching physical education because they were afraid of trying for a job they really wanted, this reveals a lack of perceived competence and autonomy. In addition, items that made up this factor's subscale included some material benefits, indicating that students choosing the profession for this reason were likely to be amotivated and extrinsically motivated, as was found.

4.3 Self-determination continuum

Some limited support for the self-determination continuum was found, as correlations with the five newly generated factors partially decreased in strength from intrinsic motivation to amotivation for items such as competent interpersonal service and role models. These inclinations were by no means highly convincing, however, broad trends are evident with factors correlating positively with intrinsic motivation showing a negative relationship with amotivation, and vice versa, even though the negative correlation with intrinsic motivation to know was not statistically significant.

4.4 Hierarchical model of motivation

It would have been desirable to see more differences in motivation between different demographic groups so that greater support could be found for Vallerand's (2000) hierarchical model of motivation. This said, global social factors such as gender and contextual social factors such as current year level were found to be related to some differences in different facets of motivation.

Within this study, the AFPE identified that the most popular reason for choosing teaching as a career was sport and physical activity, followed by role models and competent

interpersonal service. This was supported by Belka et al. (1991) who found that among the highest-ranking attractors to teaching physical education were having fun at work, helping others, and continued involvement in physical activity, and Hutchinson (1993) reporting that the desire to coach sport was a major reason people choose to teach physical education. Richardson and Watt (2006), however, did not measure sport and physical activity as the focus was on teachers in general. There was agreement on competent interpersonal service which is most likely related to Richardson and Watt's (2006) perceived ability and intrinsic reasons. Further agreement with Richardson and Watt (2006) is seen in the low rankings of the family and low perceived demands factor, as they also found the influence of significant others and using teaching as a fallback career to be the lowest ranking reasons for choosing teaching.

4.5 Models

The forward regressions carried out using the five factors from the factor analysis yielded very low adjusted R^2 values, but the models were statistically significant (all at least at the $p < 0.01$ level). The model that accounted for the most variance was the extrinsic motivation model, which was able to predict 18.0% of the variance in extrinsic motivation. Three components were included in this model, with a slightly greater emphasis on the low perceived demand factor than the confident interpersonal service and sport and physical activity factors ($\beta = 0.23, 0.20,$ and 0.19 respectively). The model for intrinsic motivation only included the confident interpersonal service reasons component ($\beta = 0.38$), and was able to account for 12.3% of the variance in intrinsic motivation. The third model accounted for 11.5% of the variance in amotivation, and used the same three components as the extrinsic motivation model. This model was unique, however, in that two factors had negative coefficients (confident interpersonal service and sport and physical activity; $\beta = -0.208$ and -0.125 respectively), and the other factor, low perceived demand had a positive coefficient (β

= 0.228). This means that students entering the physical education teaching course due to a low perceived demand were at greater risk of developing amotivation.

6. Limitations

Although a mostly reliable measure of motivation, the AMS is geared towards study at university, and may not return accurate measures of students' motivations to teach, or specifically physical education students' motivations to teach. Another problem with the AMS is that its 'extrinsic motivation – identified' sub scale has returned low values in independent reliability tests, $\alpha = 0.62$ and $\alpha = 0.64$ in testing by Vallerand et al. (1992) and the present study respectively. In the future, researchers could consider adjustments to this subscale in an effort to improve the instrument's reliability. Time pressures constrained this study to being a cross sectional design, which did not allow comparison of motivations for the same group of students as they progressed through their degree.

7. Practical Implications and further research

The choice of university degrees for high school graduates can be uncertain and it may be easy to select a course which one knows little about and as a consequence may fail to enjoy or even pass. Physical education has been seen as an easy option (Belka et al., 1991), but as this study shows, the danger in selecting the course for this reason is that it is significantly related to amotivation. Although not significantly related with two intrinsic motivation measures, the desire to play sport and be involved in physical activity is a characteristic that is related to extrinsic (and some intrinsic) motivation. This shows that the so called 'sports jocks' may be well suited to the job, although they concede intrinsic motivation to those confident individuals devoted to interpersonal service.

The significantly lower level of intrinsic motivation among males in this study is of concern. An examination of assessment or teaching methods is recommended to determine

whether girls are being taught in a way that favours their gender. Although university students undergo change during the course of a degree, students' motivation seemed quite robust, not wavering significantly throughout their studies. The only warning is for third year students who should be encouraged to keep on if faced with amotivation, as it is likely only a temporary lapse.

As intrinsic motivation has been shown to increase professional performance, further research examining the motivation of our future teachers and ways in which it may be enhanced and maintained is recommended. It would be beneficial to include other universities in further research to investigate if the trends observed in this study are common across different environments of study, or just individual variations. Further research could benefit from Vallerand's (2000) hierarchical model by using it as a framework to investigate the effects of global and situational motivation on contextual motivation, and in turn investigate how motivation impacts teaching outcomes. Longitudinal studies could seek to identify relationships between motivation at university and motivation as a teaching professional, and then examine ways to maximise the most beneficial forms of motivation during the university years, with a view to nurturing quality professionals.

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Table 1

Cronbach's Alpha Coefficients for Sub Scale Items of the AMS

| Sub-scale | α ($n = 321$) |
|--|---------------------------|
| Intrinsic motivation - to know | 0.79 |
| Intrinsic motivation - toward accomplishment | 0.85 |
| Intrinsic motivation - to experience stimulation | 0.80 |
| Extrinsic motivation - identified | 0.64 |
| Extrinsic motivation - introjected | 0.84 |
| Extrinsic motivation - external regulation | 0.72 |
| Amotivation | 0.86 |

Table 2

AFPE Items in the Context of Vallerand's (2000) Hierarchical Model of Motivation

| Contextual level | Psychological mediators | | | Hierarchical motivation | |
|------------------|---|--|------------------------------------|--|---------------------------------------|
| | Social factors | Autonomy | Competence | | Relatedness |
| Global | Gender Age | | | | |
| Contextual | Year level Second method Entry method Identification with teachers Family continuity Blocked aspirations | Desire to be physically active Desire to coach sport Material benefits Time compatability | Subjective warrant Continuation | Interpersonal reasons Service reasons | Intrinsic Extrinsic Amotivation |
| Situational | | | | | |

Table 3

Pearson Correlations Between Motivational Components Measured by the AMS and Factors for Choosing Physical Education Teaching Measured by the AFPE.

| | Intrinsic motivation to know | Intrinsic motivation toward accomplishment | Intrinsic motivation to experience stimulation | Extrinsic motivation - identified | Extrinsic motivation - introjected | Extrinsic motivation - external regulation | Amotivation |
|---------------------------------|------------------------------|--|--|-----------------------------------|------------------------------------|--|-------------|
| Competent Interpersonal Service | 0.38*** | 0.33*** | 0.28*** | 0.32*** | 0.28*** | 0.09 | -0.26*** |
| Sport and Physical Activity | 0.19** | 0.09 | -0.00 | 0.32*** | 0.17** | 0.28** | -0.18** |
| Low Perceived Demand | -0.10 | 0.03 | 0.09 | 0.06 | 0.21*** | 0.34*** | 0.19** |
| Role Models | 0.21*** | 0.14* | 0.14* | 0.13* | 0.19** | 0.15** | -0.11* |
| Family | 0.04 | 0.05 | 0.02 | 0.03 | 0.01 | 0.05 | -0.08 |

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 4

Bivariate and Partial Correlations, B , Standard Error of B and β for the Regression models.

| Predictors | Correlations between predictor and motivation | each and | Partial correlations between predictor and motivations controlling for all other predictors | B | $SE B$ | β |
|---------------------------------|---|----------|---|-------|--------|---------|
| Intrinsic motivation | | | | | | |
| Confident Interpersonal Service | 0.38 | | 0.38 | 0.39 | 0.05 | 0.38 |
| Extrinsic motivation | | | | | | |
| Sport and Physical Activity | 0.32 | | 0.19 | 0.21 | 0.06 | 0.19 |
| Low Perceived Demand | 0.27 | | 0.24 | 0.22 | 0.05 | 0.23 |
| Confident Interpersonal Service | 0.29 | | 0.20 | 0.20 | 0.05 | 0.20 |
| Amotivation | | | | | | |
| Confident Interpersonal Service | -0.26 | | -0.21 | -0.24 | 0.06 | -0.22 |
| Low Perceived Demand | 0.19 | | 0.23 | 0.25 | 0.06 | 0.22 |
| Sport and Physical Activity | -0.18 | | -0.13 | -0.17 | 0.07 | -0.13 |

Table 5

Descriptive Statistics and t-test Results for Motivation by Course Entry Method.

| Motivation sub scale | Entry method into course | | | | <i>t</i> | <i>df</i> | <i>p</i> |
|--|---------------------------|-----------|-----------------------|-----------|----------|-----------|----------|
| | Straight from high school | | All other entry modes | | | | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| Intrinsic motivation to know | 4.86 | 0.89 | 4.78 | 1.06 | 0.70 | 318 | 0.48 |
| Intrinsic motivation toward accomplishment | 3.96 | 1.09 | 4.04 | 1.18 | -0.54 | 318 | 0.59 |
| Intrinsic motivation to experience stimulation | 2.79 | 1.00 | 2.94 | 1.09 | -1.10 | 318 | 0.27 |
| Extrinsic motivation - identified | 5.55 | 0.85 | 5.49 | 0.81 | 1.12 | 318 | 0.26 |
| Extrinsic motivation - introjected | 4.09 | 1.22 | 4.09 | 1.28 | 0.08 | 318 | 0.94 |
| Extrinsic motivation - external regulation | 4.66 | 1.12 | 4.60 | 1.12 | 0.58 | 318 | 0.56 |
| Amotivation | 1.66 | 0.85 | 1.69 | 1.06 | -0.19 | 318 | 0.85 |

Table 6

Descriptive Statistics and t-test Results for Motivation by Gender.

| Motivational sub scale | Gender | | | | <i>t</i> | <i>df</i> | <i>p</i> |
|--|----------|-----------|----------|-----------|----------|-----------|----------|
| | Male | | Female | | | | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| Intrinsic motivation to know | 4.59 | 0.9 | 5.05 | 0.96 | -3.89 | 320 | 0.00 |
| Intrinsic motivation toward accomplishment | 3.81 | 1.06 | 4.17 | 1.16 | -2.72 | 320 | 0.01 |
| Intrinsic motivation to experience stimulation | 2.79 | 1 | 2.92 | 1.07 | -1.07 | 320 | 0.29 |
| Extrinsic motivation - identified | 5.41 | 0.89 | 5.64 | 0.78 | -2.04 | 320 | 0.04 |
| Extrinsic motivation - introjected | 3.92 | 1.16 | 4.25 | 1.29 | -2.21 | 320 | 0.03 |
| Extrinsic motivation - external regulation | 4.57 | 1.15 | 4.69 | 1.08 | -0.81 | 320 | -0.42 |
| Amotivation | 1.76 | 0.96 | 1.58 | 0.91 | 1.76 | 320 | 0.08 |

Table 7

Descriptive Statistics for Motivation by Second Teaching Method.

| Motivational sub scale | Second teaching method | | | | | | | | | | | |
|--|------------------------|-----------|----------|-----------|------------------------|-----------|-------------|-----------|----------|-----------|------------------------------------|-----------|
| | English | | Health | | Information technology | | Mathematics | | Science | | Studies of Society and Environment | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Intrinsic motivation to know | 4.75 | .83 | 4.88 | 1.03 | 4.54 | 1.07 | 4.75 | .91 | 5.00 | .99 | 4.80 | .74 |
| Intrinsic motivation toward accomplishment | 3.89 | 1.15 | 3.96 | 1.11 | 3.89 | 1.25 | 3.84 | 1.03 | 4.36 | 1.03 | 3.77 | 1.17 |
| Intrinsic motivation to experience stimulation | 2.94 | 1.07 | 2.77 | .95 | 2.85 | 1.09 | 2.71 | .99 | 3.07 | 1.14 | 2.72 | 1.03 |
| Extrinsic motivation - identified | 5.48 | .83 | 5.38 | .93 | 5.81 | .70 | 5.37 | .80 | 5.76 | .69 | 5.60 | .87 |
| Extrinsic motivation - introjected | 4.16 | 1.09 | 4.15 | 1.32 | 4.26 | 1.41 | 3.88 | 1.06 | 4.30 | 1.18 | 3.69 | 1.34 |
| Extrinsic motivation - external regulation | 4.35 | 1.21 | 4.63 | 1.10 | 5.03 | 1.14 | 4.31 | 1.01 | 4.98 | .97 | 4.62 | 1.21 |
| Amotivation | 1.57 | 1.03 | 1.72 | .99 | 1.76 | .92 | 1.78 | 1.01 | 1.61 | .81 | 1.51 | .75 |

Table 8

Descriptive Statistics and F-test Statistics for Motivation by Current Year Level.

| Motivational sub scale | Current year level | | | | | | | | <i>F</i> | <i>df</i> | <i>p</i> |
|---|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------|-----------|----------|
| | 1 st year | | 2 nd year | | 3 rd year | | 4 th year | | | | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| Intrinsic motivation to know | 4.87 | 0.88 | 4.93 | 0.96 | 4.60 | 1.02 | 4.88 | 0.98 | 1.48 | 3, 317 | 0.22 |
| Intrinsic motivation toward accomplishment | 3.98 | 1.09 | 4.04 | 1.16 | 3.93 | 1.10 | 4.03 | 1.18 | 0.12 | 3, 317 | 0.95 |
| Intrinsic motivation to experience stimulation | 2.78 | 0.97 | 2.90 | 1.03 | 2.84 | 1.05 | 2.91 | 1.16 | 0.37 | 3, 317 | 0.77 |
| Extrinsic motivation - identified | 5.52 | 0.81 | 5.58 | 0.82 | 5.41 | 0.91 | 5.61 | 0.80 | 0.47 | 3, 317 | 0.70 |
| Extrinsic motivation - introjected | 3.95 | 1.20 | 4.12 | 1.25 | 4.06 | 1.22 | 4.30 | 1.30 | 1.38 | 3, 317 | 0.25 |
| Extrinsic motivation - external regulation | 4.83 | 0.88 | 4.38 | 1.26 | 4.58 | 1.18 | 4.77 | 1.12 | 2.61 | 3, 317 | 0.05 |
| Amotivation | 1.56 | 0.84 | 1.51 | 0.78 | 2.11 | 1.27 | 1.56 | 0.66 | 7.92 | 3, 317 | 0.00 |