

TRANSFORMATIONAL TEACHING AND CHILDREN'S INVOLVEMENT
IN PHYSICAL EDUCATION

by

SHARON ELAINE KEITH
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Abstract

The World Health Organization (2003) has reported that less than a third of young people are sufficiently active to accrue the necessary physical and mental health benefits required for optimal growth and development. School-based physical education has been highlighted as a particularly influential context through which to encourage lifelong physical activity participation (Pate et al., 2006). The overall purpose of this thesis was to examine the prospective relationships between students' perceptions of their teachers' behaviours, as conceptualized by transformational teaching, and student self-determined motivation, self-efficacy, attitudes, and academic enabling behaviour within elementary school physical education. 533 elementary school students (aged 11-13) from 23 classes participated in this prospective observational study. Students completed an initial battery of measures mid-way through the school year that corresponded to their perceptions of their teacher's use of transformational teaching behaviours, as well as student psychological need satisfaction, self-determined motivation, self-efficacy, attitudes towards physical education (interest/value and perceived usefulness), interpersonal skills, and engagement. Two months later students completed the same measures once more. Results indicated that transformational teaching was a positive predictor of student self-determined motivation and attitudes. The relationships between transformational teaching and both student self-determined motivation and attitudes were also found to be partially mediated by psychological need satisfaction. Finally, transformational teaching was able to account for significant variance in students' reports of self-efficacy, interpersonal skills and engagement in physical education. The findings of this study add to a growing body of literature which suggests that transformational teaching may be able to facilitate student involvement in school-based physical education.

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Chapter One: Introduction

Physical education (PE) has received considerable attention in both the popular media and academic research over the past decade. CBC News recently reported that today's children are "physically illiterate" and in need of quality physical education to achieve proper psychomotor development and the skills required to participate in lifelong active pursuits (Fighting Childhood Obesity, 2009). Similarly, the New York Times reported grave concern over declining physical education opportunities, especially in light of expert recommendations that more physical activity is crucial for children to achieve healthy weight (Reed, 2004). In a similar regard the American Heart Association has strongly suggested that "schools could become the central element in a community system that ensures that students participate in enough physical activity to develop healthy lifestyles" (Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006, p. 1215).

In response to this public attention, governments around the world are emphasizing that physical education is a critical element of school programs. In Britain (Department for Children, Schools and Families, 2009) and Australia (Department of Education, Employment, and Workplace Relations, 2008), for example, physical education is included as a foundational subject in their national curricula. Similarly, provincial governments across Canada include physical education as a mandatory subject for all elementary school students. Throughout North America, several prominent professional organizations are devoted to the promotion of physical education. The National Association for Sport and Physical Education (NASPE, 2004), the Canadian Fitness and Lifestyle Research Institute (CFLRI, 2006), Physical and Health Education Canada (2008), the Centre for Disease Control (2003), and the US Surgeon General (US Department of Health & Human Services, 1996) make strong arguments in favour of physical education, many recommending daily PE for all school children.

From an *evidence-based* perspective, school-based physical education has been found to be an effective means of increasing physical activity behaviours both during and outside school hours (Kahn et al., 2002). This is indicative of the distinctive role that physical education plays in children's acquisition and development of movement skills and physical competence, both which are necessary conditions of engagement in lifelong physical activity (Fisher et al., 2005). A recent prominent study confirmed that students are more physically active on days with scheduled physical education, beyond the contribution of physical education classes, which suggests that physical education may have a stimulating effect on students to accumulate more activity after school hours (Morgan, Beighle, & Pangrazi, 2007).

Although physical education is generally identified as benefiting students' physical development, research has also provided support for the benefits that can accrue from physical education in the development of social, affective, and cognitive domains (Bailey, 2006). In particular, a recent review of the *social benefits* of physical education include the development of greater cooperation, team work, empathy, and a sense of personal responsibility, as well as improved attendance, interpersonal behaviour, attitudes toward school, and reductions in anti-social behaviour (Bailey et al., 2008). Furthermore, this review also highlighted a number of positive associations between physical education participation and distinct dimensions of *affective development*. That is, physical education and physical activity participation were reported to improve self-esteem, self-perceptions, and psychological well-being, as well as to reduce stress, anxiety, and depression (Bailey et al., 2008). Finally, with regard to *cognitive development*, studies demonstrate that time devoted to physical education does not impede academic achievement in other subjects (despite a reduction in the study time of academic material); conversely, increased time in physical education has been found to enhance students' classroom academic performance (Shephard, 1997; van der Mars, 2006).

In light of the fact that childhood represents a critical period for the adoption of health habits and behaviours (Boreham & Riddoch, 2001; Hancox, Milne, & Poulton, 2004), school-based physical education is often highlighted as a particularly influential vehicle through which to encourage lifelong physical activity participation (Biddle, Sallis, & Cavill, 1998; Pate et al., 2006). Specifically, positive experiences in physical education are theorized to influence children to adopt active lifestyles as adults (Trudeau & Shephard, 2008). This is particularly salient given the serious reports of inactivity among children and youth and the consequences for public health. The most recent *Report Card on Physical Activity for Children and Youth* (Active Healthy Kids Canada, 2009) suggests that 87% of Canadian children and youth are not meeting guidelines outlined within Canada's Guide to Physical Activity (Public Health Agency of Canada, 2007).

Consequences of inactivity include excess body weight and obesity, both which have been identified as major risk factors for a number of chronic health problems, including diabetes, cardiovascular diseases and some cancers (World Health Organization, 2008). Recommendations from the World Health Organization (2003) highlight that the “prevention of these diseases through physical activity and healthy lifestyles, based on strong medical evidence, is the *most cost effective* and *sustainable* [emphasis added] way to tackle these problems and to support positive social development” (p. 1). To illustrate the potential for physical education to act as a salient health promotion vehicle, the US National Longitudinal Study of Adolescent Health indicated that for every weekday with a physical education class, there was a 5% decrease in the odds of becoming overweight adults, with participation in all 5 weekdays of physical education accumulating to decrease the odds by 28% (Menschik, Ahmed, Alexander, & Blum, 2008). Considering the benefits of physical education and the ramifications of inactive youth, the overall purpose of this thesis was to examine the relationship between

teachers' behaviours and elementary school students' motivation and attitudes toward physical education.

The research presented in this thesis focused on elementary school students for several reasons. First, in Canada, physical education is a mandatory school-subject for all elementary school children. This allows observation of the full range of motivation-related cognitions and behaviours that may exist in schools (Biddle, 2001). Indeed, Papaioannou (1994) observed that greater variability typically exists in students' abilities in school physical education than in competitive or recreational sport, and as a result represents a salient context to understand the motives of disaffected (and amotivated) students as much as those that are highly (and intrinsically) motivated. Second, in the past two decades, the prevalence of pediatric obesity has risen dramatically. In 2004, 18% of children were identified as overweight and 8% were identified as obese, accounting for more than one-quarter of all children (Canadian Institutes of Health Research, 2009). Thus, understanding potential social factors that might intervene to reverse this trend would appear necessary. In a similar regard, research has also demonstrated that enjoyment ratings of physical education decrease significantly from the fourth to sixth grades for both boys and girls alike (Prochaska, Sallis, Slymen, & McKenzie, 2003). Finally, a recent study by Campagna and colleagues (2007) examined children's adherence to current recommended guidelines for health (i.e., at least 60 minutes of moderate to vigorous physical activity on five or more days per week) across the spectrum of school-aged students. They found that while 96 percent of grade three students met this target, by grade seven only 45 percent of boys and 25 percent of girls met this guideline (Campagna et al., 2007). In light of these general trends it would seem necessary to understand potential social influences of behaviour before children withdraw their interest and involvement in physical education and active lifestyles.

The investigation highlighted in this thesis specifically focused on the extent to which teachers influence students, because prior research suggests that teacher behaviour emerges as the most influential factor when examining student attitudes toward physical education (Goudas & Biddle, 1994). The primary paradigm that has been used to understand the influence of physical education teachers on student motivation draws from achievement goal theory (Nicholls, 1984) and centres on the role of class-based motivational climates. In the following section I provide a brief review of this literature, and thereafter introduce a new and alternative paradigm (that draws from organizational psychology) to understand children's involvement in physical education.

Achievement Goal Theory and Motivational Climates in Physical Education

In achievement contexts, motivation theorists are often concerned with asking *why* certain factors influence achievement behaviour. Social cognitive approaches to motivation suggest that an individual with high versus low motivation will think differently about failure versus success (Weiner, 1972). In an effort to better understand and potentially enhance motivation in sport and physical education, an achievement goal perspective of children's behaviour, cognition, and affective response patterns was developed over 25 years ago by John Nicholls and his colleagues. *Achievement goal theory* assumes that individuals are intentional, rational, and goal-directed (Nicholls, 1984) and that achievement goals govern beliefs and guide behaviour in achievement contexts (e.g., Ames, 1992; Dweck, 1986; Maehr & Nicholls, 1980; Roberts, 2001). While alternate goals may operate in non achievement contexts, the achievement goal perspective presumes that the goal of action is to demonstrate competence, distinguished particularly by perceived ability (Dweck, 1986, Nicholls, 1984). Achievement is the attainment of a socially or personally valued goal (Roberts, 2001), with failure and success

based on a person's *interpretation* of the effectiveness of their achievement striving (Maehr & Nicholls, 1980). Nicholls (1984, 1989) asserted that two achievement goals, namely task and ego orientations, exist in achievement settings and that these goals are determined by both dispositional and situational factors.

When a person is task-involved, the goal of action is the development of mastery, improvement and learning, and the demonstration of ability is self-referenced. By comparison, when a person is ego-involved, the goal of action is to demonstrate ability relative to others, specifically to outperform others, so ability is referenced with regard to others' performances and achievements. Because task-involved individuals do not see ability and peer-referenced performance as paramount, they are likely to persist through failure, seek challenging and interesting tasks, and exert effort. Ego-involved individuals, on the other hand, consider peer-referenced ability as centrally relevant to their goals. Specifically, an ego-involved individual with perceptions of high ability will likely demonstrate competence and motivational persistence, whereas an ego-involved individual with perceptions of low ability will likely display maladaptive achievement behaviours including challenge avoidance, reduced persistence, even withdrawal from activities (Nicholls, 1989).

These distinct achievement goal orientations have been linked with a number of salient motivational outcomes. For example, a task orientation has been positively associated with enjoyment and effortful persistence (Thomas & Barron, 2006), intrinsic interest (Cury, Biddle, Famose, Goudas, Sarrazin, & Durand, 1996), and continued participation in physical activity (Papaioannou, Bebetos, Theodorakis, Christodoulidis, & Kouli, 2006). In contrast, ego orientations diminish intrinsic motivation due to a focus on social comparison (Deci & Ryan, 1980), as well as elicit higher anxiety, worry and concentration disruptions (White & Zellner, 1996). Interestingly, Nicholls (1984, 1989) theorized that goal orientations are orthogonal, whereby a person can be high or low in either or both at the same time. This assumption has

been empirically supported within the context of physical education (Wang, Biddle, & Elliott, 2007). Recent research further highlights that a high level of task orientation (singularly, or in combination with ego orientation) is preferable for students in physical education contexts as it fosters self-determined motivation (Standage & Treasure, 2002).

Subsequent research by Elliott and his colleagues (Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996) suggested a trichotomous achievement goal framework whereby the ego goal construct was partitioned into approach and avoidance distinctions. More recently, Elliott refined this into a 2x2 framework (Elliot & McGregor, 2001) where both task and ego orientations were theorized to incorporate both approach and avoidance components. Specifically, in this framework, competence is defined by self-referent standards (task/mastery) or other-referent standards (ego/performance), and can focus on either positive possibilities (approach) or negative possibilities (avoidance). These four achievement goals can be conceptualized in physical education in the following manner: mastery-approach (e.g., wanting to learn as much as possible in PE), mastery-avoidance (e.g., worried about not being able to learn everything presented), performance-approach (e.g., focused on showing greater skill than peers), and performance-avoidance (e.g., anxious to ensure that poor skill level is not demonstrated). While some support has emerged for the validity and utility of this expanded framework (Elliot & Conroy, 2005), outcomes emanating from this model are more complex. In general, mastery-approach and performance-approach goal adoption are more likely to lead to beneficial outcomes such as perceiving environmental demands as opportunities for mastery and growth, whereas mastery-avoidance and performance-avoidance goals are highly correlated and correspond to more aversive processes (Adie, Duda, & Ntoumanis, 2008).

It is important to note that achievement goals are not ‘traits’, they are cognitive schema, subject to change as the individual processes task-specific information (Roberts, 2001). In particular, situational factors (Nicholls, 1984) around a given activity can significantly influence

an individual's achievement states of involvement. Ames (1992) referred to one set of such factors as *motivational climates*, and defined them as situationally induced psychological environments directing goals of action. In particular, the structure of classroom environments can make it more or less likely that achievement behaviours associated with a particular achievement goal will be adopted. A *mastery-oriented climate* highlights effort, improvement, cooperation, and self-referent goals (Ames, 1992). A *performance-oriented climate*, on the other hand, places emphasis on social comparison and winning competitions (Ames, 1992). These motivational climates elicit distinct outcomes for students in physical education. Mastery-oriented climates are positively associated with satisfaction, intrinsic motivation, increased perceptions of ability, increased effort, positive attitudes toward physical education, and voluntary participation (Cox & Williams, 2008; Spray & Biddle, 1997; Treasure, 1997). Alternatively, performance-oriented climates increase the emphasis on normative ability, produce negative attitudes toward physical education, increase worry and boredom, and lead to an avoidance of activities in class (Ntoumanis & Biddle, 1999; Ommundsen & Roberts, 1999; Pekrun, Elliot, & Maier, 2006).

Research has clearly outlined that a mastery-oriented climate which fosters task-involved achievement behaviours are most adaptive for physical education (Carr, 2006; Ommundsen, 2006; Treasure, 2001). Furthermore, it has been shown that achievement goals are predicted by their respective climate dimensions (cf., Biddle, 2001). This is noteworthy, as studies have shown that teachers may be able to structure specific motivational climates to foster particular achievement states of involvement and in doing so considerably influence a child's physical education experience (Treasure, 2001). In particular, teachers can follow Epstein's (1988) six basic building blocks of an achievement setting (e.g., task, authority, recognition, grouping, evaluations, and timing; TARGET) to influence a class motivational climate. Both Treasure

(2001) and Biddle (2001) have outlined suggested instructional strategies for teachers to implement the TARGET structures to achieve task-involved motivational climates.

In one interesting study, Morgan, Sproule, Weigand, and Carpenter (2005) examined in-training teachers' implementation of TARGET structures in middle school physical education classes and observed that recognition, time, and evaluation structures generally revealed a strong mastery focus, whereas task design, authority, and grouping structures were more performance focused. Interestingly, students were more likely than their teachers to perceive a performance climate, indicating that teachers may inadvertently create a higher performance-involving climate than they are aware (Morgan et al., 2005).

Although achievement goal theory provides a useful framework for examining student motivation, it is not without limitations. Specifically, even though research consistently shows that task-involved climates are superior to ego-involved ones, research in this area provides limited insight into the specific behaviours employed by teachers and how they might influence students' psychological and behavioural responses. In this thesis, an alternative perspective is utilized that draws from organizational psychology, and focuses on understanding the relationship between teacher behaviours and student involvement in physical education.

Transformational Teaching: A New Paradigm for School-Based Physical Education?

While research on children's motives toward physical education have primarily been studied from an achievement goal perspective, recent research has adopted an alternative theoretical perspective from organizational psychology with a view to understanding and potentially fostering student motivation and engagement in physical education (Morton, Keith, & Beauchamp, in press). Specifically, this research draws from the theoretical tenets of

transformational leadership theory to understand how the behaviours displayed by teachers might influence the physical activity adoption and maintenance behaviours of adolescents in educational and health promotion settings.

Transformational leaders inspire, energize and intellectually stimulate others and the behaviours they display have been found to predict positive attitudes, motivation, and behaviours among followers (Bass & Riggio, 2006). The study of transformational leadership has garnered great attention over the past few decades (Piccolo & Colquitt, 2006), and has been studied in contexts as diverse as the military (Bass, Avolio, Jung, & Berson, 2003), corporate organizations (Kark, Shamir, & Chen, 2003), manufacturing (Purvanova, Bono, & Dziewieczynski, 2006), health care (Arnold, Turner, Barling, Kelloway, & McKee, 2007), sport (Rowold, 2006), and exercise (Beauchamp, Welch, & Hulley, 2007).

Drawing from Burns' (1978) influential book on political leadership, Bernard Bass initially developed a *Full Range Model* (FRM) of leadership effectiveness that included laissez-faire, transactional, and transformational behaviours (Avolio & Bass, 1991). In this model laissez-faire leadership represented the most passive and least effective form of leadership and transformational behaviours represented the most active and effective form of leadership.

Broadly defined, *laissez-faire* leaders generally avoid responsibility by procrastinating and evading decision-making, *transactional* leaders use behavioural monitoring and contingent reinforcement to reward or discipline followers, and *transformational* leaders transcend personal self-interests to empower, inspire, and challenge others to achieve higher levels of functioning (Bass & Riggio, 2006). With regard to their relative effectiveness, laissez-faire leaders lack adequate leadership skills to handle their responsibility and authority. While transactional behaviours are considered moderately effective, transformational leadership is theorized to have an augmentation effect whereby "transformational leadership styles build on the transactional base in contributing to the extra effort and performance of followers" (Bass, 1998, p. 5). In the

following section a brief review of each leadership dimension is provided and thereafter a rationale is provided for exclusively focusing on transformational behaviours exhibited by teachers in relation to salient health-related cognitions (e.g., motivation and self-efficacy), attitudes (e.g., interest/value and perceived usefulness), and behaviours (e.g., interpersonal skills and engagement) among children within physical education contexts.

Laissez-faire Leadership

Laissez-faire leaders avoid providing direction or support, withhold feedback and rewards, abdicate responsibility, deflect requests for help, refrain from intervening, and generally appear indifferent to what is happening around them (Avolio & Bass, 1991). Bass (1985) referred to this dimension as *non-leadership*. However, some researchers have suggested that laissez-faire leadership behaviour is worse than simple zero-leadership (i.e., lack of presence). Kelloway, Sivanathan, Francis, and Barling (2005) theorized that poor leadership, including laissez-faire leadership, may cause workplace stress and strain as a result of role conflict, role ambiguity and the perceptions of low-quality interpersonal treatment by the leader. When examined empirically, laissez-faire leaders have been found to exhibit destructive behaviours, associated with conflict, bullying, and psychological distress among followers (Skogstad, Einarsen, Torsheim, Aasland, & Hetland, 2007). Clearly these negative psychosocial outcomes are undesirable in educational settings. While some anecdotal reports have emerged indicating that competent followers can empower themselves and produce profitable outcomes in the workplace despite a laissez-faire leader (Bass & Riggio, 2006), this is unlikely to manifest successfully in the classroom, as students do not have the capabilities or resources to compensate for the role of teachers to offer direction and mold experiences.

Transactional Leadership

Transactional leadership is characterized by a leaders' use of reinforcement to reward or discipline followers and is comprised of two sub-dimensions: management-by-exception and contingent reward (Bass & Riggio, 2006). *Management-by-exception* is characterized by leaders monitoring the behaviour of their followers and taking corrective action as necessary, depending on the standards expected. *Passive* management-by-exception occurs when leaders delay responding to errors until absolutely necessary. Specifically, leaders wait passively for mistakes to be made and may not take action until complaints are received. Alternatively, *active* management-by-exception occurs when leaders clarify standards and then actively monitor followers by focusing on their errors at the expense of recognizing positive behaviours. Evidence of deviation from expected standards often elicits a demeaning response from the leader. In contrast to the negative reinforcement of management-by-exception, *contingent reward* behaviours involve goal setting and the provision of feedback in line with expectations for followers' behaviour. Such behaviours include rewards in exchange for followers' satisfactory completion of assigned tasks. This sub-dimension is considered to represent "good" leadership (Bass, 1985).

While effective transactional strategies, especially contingent reward behaviours, are moderately effective and invariably used by leaders and educators, considerable research has established that they are less ideal for the promotion of *sustained behaviour change*. Within education and health-promotion settings, contingent rewards have been found to facilitate short-term compliance (Donatelle, Hudson, Dobie, Goodall, Hunsberger, & Oswald, 2004), but undermine autonomous motivation (Deci, Koestner, & Ryan, 1999). Similarly, discipline-oriented strategies are generally ineffective in creating more sustained positive school climates (Sugai & Horner, 2002). To overcome these limitations, transformational leadership is theorized to provide positive augmentation beyond the effects of transactional leadership (Bass,

1998). Evidence for this supplementary effect has been substantiated empirically (Bass et al., 2003; Judge & Piccolo, 2004), whereby greater follower motivation, satisfaction, and performance is uniquely attributed to the transformational qualities of a leader, beyond the influence of transactional behaviours. As such, transformational leadership is theorized to be the most salient construct within the Full Range model and the most salient predictor of positive psychosocial outcomes among followers. For these reasons, the present study focused exclusively on transformational behaviours.

Transformational Leadership

Transformational leaders inspire followers, provide meaningful tasks, encourage intellectual engagement, and offer support and mentoring (Bass & Riggio, 2006).

Transformational leadership is comprised of four conceptually distinct dimensions that include idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Avolio & Bass, 1991; Bass, 1985; Bass & Riggio, 2006). *Idealized influence* occurs when leaders act in the best interest of others, demonstrate high standards of ethical conduct, and emphasize the importance of a collective sense of purpose. Leaders who exhibit idealized influence also act as role models, engender trust and respect from their followers, and lead through the demonstration of personally held values and beliefs. *Inspirational motivation* occurs when leaders display optimism and enthusiasm, and energize followers to go beyond minimally expected standards. By motivating and inspiring followers, transformational leaders demonstrate commitment to shared goals, provide a compelling vision for the future, and provide meaningful and challenging environments for followers. *Intellectual stimulation* is generated when leaders encourage followers to think for themselves, question assumptions, approach old problems in new ways, and think creatively. Finally, *individualized consideration* occurs when leaders pay special attention to individual needs and celebrate others' personal

accomplishments. They act with genuine care, compassion, and empathy toward their followers (Bass & Riggio, 2006).

Transformational leadership has been shown to positively influence various desirable attitudes in followers. For example, transformational leadership is associated with increases in followers' ratings of perceived job satisfaction (Judge & Bono, 2000), morality and engagement (Dvir, Eden, Avolio, & Shamir, 2002), safety consciousness (Barling, Loughlin, & Kelloway, 2002), and psychological well-being (Arnold et al., 2007), as well as significant reductions in employees' cynicism about organizational change (Bommer, Rich, & Rubin, 2005).

Transformational leaders influence performance outcomes through the mediating effects of psychosocial attitudes and cognitions (Barling, Christie, & Hopton, in press). For example, Avolio, Zhu, Koh, and Bhatia (2004) found that empowerment mediated the relationship between transformational leadership and organizational commitment. Specifically, within a health care setting, when senior nurse officers exhibited transformational behaviours, staff nurses were more likely to identify with as well as indicate involvement in and loyalty to the hospital because they felt a greater sense of competence, impact, meaning, and self-determination in their role (Avolio et al., 2004).

With particular relevance to the present study, research has demonstrated that transformational leadership is significantly associated with adaptive motivation-related cognitions and attitudes including self-efficacy (Kark et al., 2003; Kirkpatrick & Locke, 1996; Pillai & Williams, 2004), and intrinsic motivation (Bono & Judge, 2003; Charbonneau, Barling, & Kelloway, 2001; Piccolo & Colquitt, 2006; Purvanova et al., 2006). Interestingly, transformational leadership has also been consistently found to be associated with a number of important *behavioural* outcomes among followers, including, but not limited to improvements in unit performance of military platoons (Bass et al., 2003), financial indicators at bank branches (Barling, Weber, & Kelloway, 1996), organizational citizenship behaviours (Purvanova et al.,

2006), technical quality and profitability of research and development teams (Keller, 2006), and sports performance among university athletes (Charbonneau et al., 2001).

Although transformational leadership theory has also been applied to educational contexts, previous research has primarily focused on either university students or the effects of school principals' behaviour on teachers. For example, Harvey, Royal, and Stout (2003) found that transformational leadership as demonstrated by university instructors was positively associated with student ratings of instructor performance and student in-class involvement. Similarly, using an experimental design, transformational leadership among instructors was found to relate to increases in the creativity of university students (e.g., quantity and quality of ideas generated from a brainstorming task; Jung, 2001). In the context of school administration, displays of transformational leadership by principals has been shown to positively influence school culture (Leithwood & Jantzi, 2000), teacher job satisfaction (Griffith, 2004; Nguni, Slegers, & Denessen, 2006), and teachers' organizational commitment and citizenship behaviours (Koh, Steers, & Terborg, 1995). However, a recent review highlighted that principals only have a small and indirect effect on student outcomes that is essentially mediated by class teachers' influence (Robinson, Lloyd, & Rowe, 2008).

In recent years some have suggested that leadership in schools should not be the sole responsibility of the principal (Katzenmeyer & Moller, 2001). In fact, teachers have been highlighted as social agents (or leaders) with potential to influence both students in the classroom and the extended educational community (Cranston, 2000). Given that leadership is broadly defined as "an influence process that assists groups of individuals toward goal attainment" (Northouse, 2007, p. 12), in many respects effective teaching is synonymous with effective leadership, and vice versa. Consequently, transformational leadership theory represents an informative conceptual framework to understand the relationship between teaching behaviours and student engagement in school-based physical education.

Transformational Teaching: A Construct Validity Perspective

As highlighted above, recent research has applied transformational leadership theory to understand students' perceptions of their physical education teachers' behaviours. Specifically, Morton and colleagues (in press) utilized focus groups and interviewed adolescents on the extent to which transformational leadership behaviours were perceived as being currently employed by their physical education teachers, as well as students' preference for these behaviours in their teachers. Findings indicated that behaviours employed by physical education teachers can be understood within a conceptual framework reflecting transformational leadership theory. Interestingly, in many respects, the range of transformational behaviours demonstrated by school physical education teachers in this study reflected the transformational behaviours exhibited by leaders within other work-based settings. In addition, students who identified their teachers as displaying transformational behaviours also reported more adaptive responses. For example, these outcomes included cognitive (i.e., positive beliefs and attitudes toward physical activity, motivation to be physically active), affective (i.e., enjoyment of physical education, satisfaction with the teacher), and behavioural (i.e., engaging in physical education, leisure time physical activity) responses (Morton et al., in press).

Building on this preliminary investigation, Beauchamp, Barling, Li, Morton, Keith, and Zumbo (2009), subsequently sought to develop a conceptually sound and psychometrically robust measure of *transformational teaching* for use within school-based settings, named the Transformational Teaching Questionnaire (TTQ). This three-phase investigation made use of established instrument development procedures, including (a) focus groups and interviews with adolescents and teachers, as well as experts in transformational leadership theory (to establish content validity), and (b) multilevel confirmatory factor analysis (to evaluate factorial validity). In the final phase of this investigation, Beauchamp and colleagues (2009) examined the concurrent relationships between transformational teaching and adolescent motivation and

affective responses within physical education. While scores derived from the TTQ demonstrated good reliability and construct validity, transformational teaching was also found to positively predict significant variance in adolescent self-determined motivation and positive affect (at both the student and class levels). This finding suggests that teachers have the potential to enhance student motivation and enjoyment of physical education through both their one-on-one interactions with students and also through the general climate they create with their class.

While the studies by Morton et al. (in press) and Beauchamp et al. (2009) were conducted with adolescents in high school settings, research has yet to examine the predictive utility of the transformational teaching construct with younger, elementary school students. This is particularly important considering the distinct learning environments experienced by elementary and secondary school students in relation to physical education. Secondary school students are taught by physical education specialists whereas most elementary school students receive physical education instruction from classroom teachers with little or no training in physical education. Rink and Hall (2008) contend that qualified physical education teachers display more effective teaching behaviours, such that students in classes taught by specialists achieve more, have higher fitness levels, and exhibit more positive attitudes toward physical activity. With regard to weekly opportunities for physical education, secondary school students receive a devoted allotment in their timetable to physical education whereas elementary school students receive curriculum instruction based on the schedules of individual teachers. Indeed, elementary school teachers report competition with other subjects as the main barrier preventing the incorporation of regular and sufficient physical education into their weekly programming (Morgan & Hansen, 2008). Thus this thesis sought to examine the *external validity* of scores derived from the TTQ, by examining the relationships between transformational teaching and key indices of psychological functioning among elementary school students. These indices

included student self-determined motivation, self-efficacy, attitudes, and academic enabling behaviours. The hypothesized relations tested in this thesis are outlined below.

Self-Determination Theory of Motivation

Within the motivational framework of self-determination theory (Deci & Ryan, 1985), individuals can vary greatly in how they are motivated toward an activity. Self-determination theory argues that behaviour can be broadly categorized as intrinsically motivated, extrinsically motivated, or amotivated (Deci & Ryan, 1985). *Intrinsic motivation* represents the prototypical model of self-regulation and is characterized by undertaking behaviours for the enjoyment, interest, and satisfaction inherent in the activity itself. *Extrinsic motivation* refers to engaging in an activity as a means to an end, not for its own sake and represents the extent to which individuals' actions are directed by external factors. In particular, extrinsic motivation is comprised of several conceptually distinct types of regulation, reflecting further the continuum of self-determination. First, identified regulation involves actions motivated by an appreciation of the outcomes of participation, whereby behaviour is valued, deemed important, and is done out of choice but it is still pursued for extrinsic reasons. An example of this type of motivation might include participating in physical education to acquire more advanced sports skills. Second, introjected regulation involves an individual operating under internal contingencies for rewards and punishments (e.g., hope for teacher/peer approval). The final and most controlling type of extrinsic motivation is external regulation, whereby behaviour is controlled by external constraints or rewards (Ryan & Deci, 2007). An example might include a student who shows effort in PE class only because he or she expects to be rewarded with a satisfactory grade. *Amotivation* refers to situations where individuals perceive no contingencies between outcomes and their actions, where they perceive no value in the activity (Ryan & Deci, 2007), or where

they experience feelings of uncontrollability, especially in settings of mandatory participation (e.g., physical education class; Vallerand, 1997). As seen in Figure 1, these motivational categories are proposed to form a continuum of self-determination.

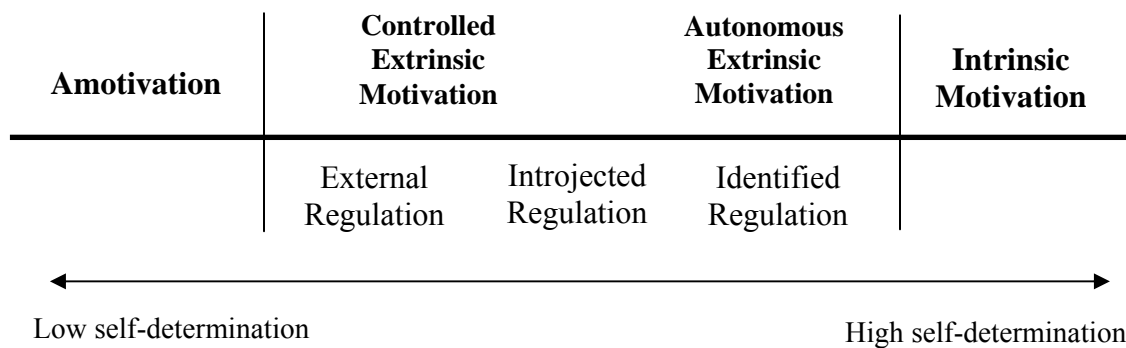


Figure 1. Continuum of self-determination (adapted from Ryan & Deci, 2007, p. 8)

It is important to recognize that this is not a developmental continuum or a stage model; rather, depending on social conditions, people can operate anywhere along the continuum (Ryan & Deci, 2007). Research has consistently shown that autonomous forms of motivation (intrinsic as well as identified regulation) are associated with adaptive outcomes in physical activity contexts such as behavioural persistence (Pelletier, Fortier, Vallerand, & Briere, 2001), positive affect (Standage, Duda, & Ntoumanis, 2005), and enhanced self-esteem (Wilson & Rodgers, 2004); whereas controlling types of extrinsic motivation and amotivation have been linked to maladaptive consequences such as drop-out (Pelletier et al., 2001), unhappiness (Standage et al., 2005), and boredom (Ntoumanis, 2001). Self-determined motivation has also been shown to improve achievement in physical education, whereby students display more effort, perform better, and obtain better grades when they are intrinsically motivated (Boiche, Sarrazin, Grouzet, Pelletier, & Chanal, 2008). Furthermore, self-determined motivation is linked to improved self-esteem, social development, and personal values of children within schools (Deci & Ryan, 1985). Of particular significance, recent research has empirically linked self-determined

motivation for physical education with higher levels of objectively measured in-class physical activity in both structured and free-choice class time (Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009).

To conceptualize the *sources* of varying forms of motivation, Deci and Ryan (2000) proposed that three key psychological needs mediate the relationship between social influences and self-determined motivation, namely competence, relatedness, and autonomy. *Competence* involves striving to control outcomes and to experience mastery and effectiveness. *Relatedness* involves striving to be accepted and to get along with others within a social environment. Finally, *autonomy* involves volition, or choice, and the freedom to initiate behaviours. As an extension of deCharms' (1968) early concepts of preference for being the 'origin' rather than the 'pawn', autonomy involves having control over ones' own behaviour (Deci & Ryan, 1985). According to self-determination theory, social environments that satisfy these three psychological needs are purported to bring about greater intrinsic motivation, growth, development, and well-being (Ryan & Deci, 2007; Standage & Vallerand, 2007). Indeed, self-determination can either be supported or hindered by environmental forces, such as teacher influence (Deci & Ryan, 1985). For example, autonomy-supportive climates in physical education provide choice, initiation, and understanding, and facilitate healthy development and optimal psychological functioning (Deci & Ryan, 1985). Several studies have demonstrated positive correlations between autonomy supportive teacher-generated climates and self-determined forms of motivation through the satisfaction of the three basic psychological needs (Deci, Schwartz, Sheinman, & Ryan, 1981; Haggard & Chatzisarantis, 2007; Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2006). Salient outcomes to emanate from such environments include independent, intrinsic learning within classrooms (Deci et al., 1981), as well as effort and persistence in physical education (Standage et al., 2006).

Based on key elements from self-determination theory (Deci & Ryan, 1985), Vallerand and Losier (1999) developed a motivational sequence which serves to integrate the literature on the determinants and consequences of intrinsic and extrinsic motivation, specifically within physical activity contexts. The basic premise of the motivational sequence is that social factors contribute to psychological need satisfaction, which influences motivation, and thereafter salient consequences (Standage & Vallerand, 2007; see Figure 2).

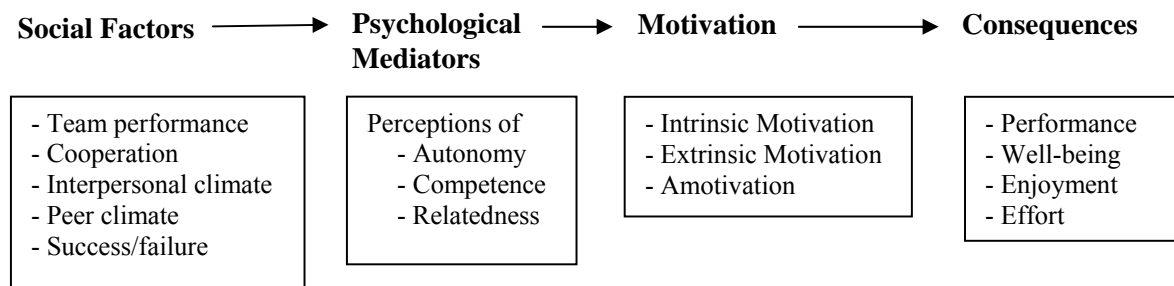


Figure 2. Motivational sequence proposed by Self-Determination Theory (Standage & Vallerand, 2007, p 180; Adapted from Vallerand & Losier, 1999).

When Ntoumanis (2001) examined this framework within physical education it was found that positive social factors (e.g., promotion of cooperative learning, emphasis on individual improvements, and choice of tasks) led to positive motivational outcomes (e.g., leisure time physical activity) through the satisfaction of students' psychological needs. Interestingly, Hagger and colleagues (2009) identified that motivation can be transferred across contexts whereby autonomous motivation in physical education was enhanced through perceptions of autonomy supportive teachers, which in turn further influenced autonomous motivation for leisure time physical activity.

From a transformational leadership perspective, Sheldon, Turban, Brown, Barrick, and Judge (2003) theorized in a prominent review paper that transformational leadership is a contextual factor that helps followers to develop more internalized motives. Specifically, transformational leaders encourage self-expression which promotes the development of

autonomy-supportive relationships. Second, competence is enhanced through intellectual stimulation whereby transformational leaders improve knowledge, learning, and understanding among others (Charbonneau et al., 2001). Lastly, relatedness is developed when a leader frames goals and expectations in ways that appeal to followers (inspirational motivation) and demonstrate concern for the well-being of others (individualized consideration). In sum, through the satisfaction of these three psychological needs, transformational leaders are theorized to have significant potential to enhance the self-determined motives of followers.

Consistent with this theoretical perspective, Charbonneau et al. (2001) found support for the association between transformational leadership behaviours among sport coaches and intrinsic motivation among sport team athletes. However, in their investigation psychological need satisfaction was not included in their analyses as a theoretical mediator. When applied to adolescent physical education, Beauchamp et al. (2009) found support for transformational teaching in relation to high school students' self-determined motivation. However, Beauchamp and colleagues' study examined the relationship concurrently, and as such there is need to examine these relations prospectively (over time). Thus, in line with theorizing by both Sheldon et al. (2003) and Ryan and Deci (2007) and extending from previous sport and educational research, the current study examined the relations between teacher behaviours (as conceptualized by transformational teaching) and student motivation (via psychological need satisfaction) for physical education. It was hypothesized that:

Hypothesis 1: *There will be a positive relationship between transformational teaching and student psychological need satisfaction.*

Hypothesis 2: *Student psychological need satisfaction will be related to self-determined motivation for physical education.*

Hypothesis 3: *There will be a positive relationship between transformational teaching and student self-determined motivation for physical education and this relationship will be mediated by psychological need satisfaction.*

Self-Efficacy

Self-efficacy is grounded in social cognitive theory (Bandura, 1986), which postulates that human achievement depends on interactions between one's behaviours, personal factors, and environmental conditions. This perspective emerged in contrast to behavioural theorists (e.g., Skinner, 1974) who asserted that behaviour was driven solely by reactions to environmental stimuli. Bandura (1986) emphasized that individuals are proactive agents in determining their behaviour. By recognizing the value of both internal and external factors, social cognitive theory was built on the premise of triadic reciprocal determinism. Specifically, Bandura (1997) proposed that human functioning is supported by the interaction between personal factors (e.g., cognitive, affective, and biological states), as well as environmental influences (e.g., reinforcement, task difficulty, presence of others), and behavioural (e.g., previous performance level, effort) inputs (see Figure 3).

To illustrate the salience of this framework within physical education, students may feel confident in their ability to participate (i.e., personal factor) when they are familiar with the nature of the activity presented within the curriculum (i.e., environmental factor). In a reciprocal manner, if students then perform well in class (i.e., a behavioural factor), this may influence their thoughts and feelings (i.e., personal factors) when the opportunity arises to engage in that activity outside of school (i.e., environmental factor). A key 'personal' factor central to social cognitive theory is termed *self-efficacy*.

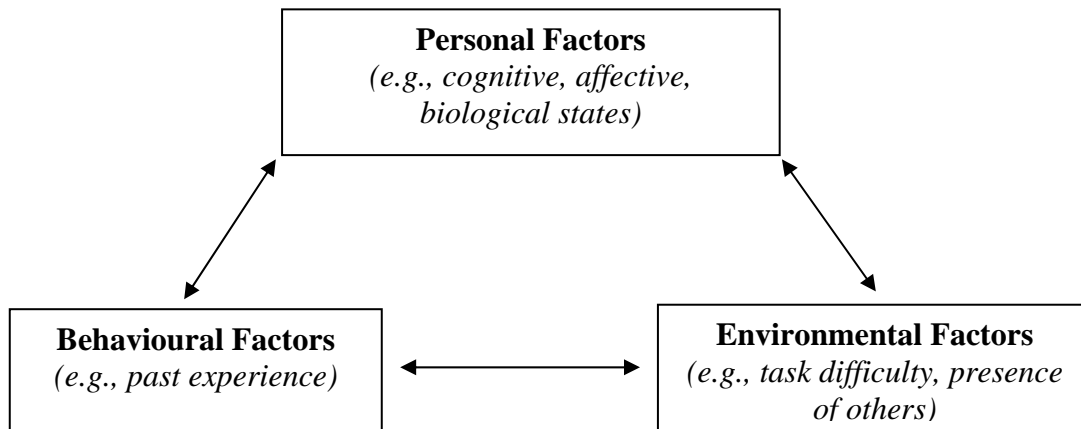


Figure 3. The relationship between the three major classes of determinants in triadic reciprocal causation (adapted from Bandura, 1997, p. 6)

Self-efficacy represents a situation-specific form of self-confidence. Specifically, this social cognition refers to “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). These beliefs are not concerned with the number of skills that one has, but rather represent judgements of what an individual can accomplish with these skills. According to Bandura (1997), there are four principal sources of information that provide an individual with a sense of self-efficacy. These include performance accomplishments, vicarious experience, verbal persuasion, and perceptions of one’s physiological and affective states. Success enhances a person’s beliefs in his or her personal efficacy whereas failure undermines it; as such, performance accomplishments are the most influential source of information as it represents the most authentic evidence about what one can achieve (Bandura, 1997). Without direct experience, efficacy information can also be derived from observing and comparing oneself with others. Vicarious experience, or modeling, involves the observer interpreting and judging the outcomes and consequences of specific actions displayed by others. Through this process, individuals can obtain valuable information about procedural achievement, coping strategies, and progress indicators (Bandura, 1997), and

even competition evaluation (Feltz, Short, & Sullivan, 2008). Valuable efficacy information can also be gained from verbal persuasion whereby a significant other expresses confidence in one's capabilities (Bandura, 1997). Although verbal persuasion alone may be limited in its power to create enduring increases in perceived efficacy, it can "bolster self-change if the positive appraisal is within realistic bounds" (Bandura, 1997, p. 101). One final source of information is generated by monitoring physiological and affective states. This allows individuals to judge their capabilities, strength, and vulnerability by monitoring their arousal and stress levels (i.e., tension, fatigue, heart rate, pain; Bandura, 1997).

Another important 'personal' component of social cognitive theory corresponds to *outcome expectancies*. While self-efficacy relates to confidence in one's ability to produce a specific performance, outcome expectancies involve "a judgement of the likely consequences such performances will produce" (Bandura, 1997, p. 21). Bandura theorized that outcome expectancies could take the form of physical (e.g., pain), social (e.g., interest or disinterest, approval or disapproval), or self-evaluative (e.g., self-satisfaction) expectations derived from effective or defective performances. Bandura (1997) further outlined that self-efficacy beliefs precede outcome expectancies, whereby ability (and belief in one's ability) is the pre-requisite to envisioning success in a given context. For example, a student in physical education who concedes that he or she cannot play basketball well would not expect to receive a very good grade in that module. The causal chain of events proposed by self-efficacy theory illustrates that individuals' beliefs regarding lack of ability (i.e., low self-efficacy) can subsequently be linked with negative repercussions (i.e., outcome expectancies) associated with engaging in a given activity. Alternatively, high self-efficacy would result in affirmative expectancies, likely generating behaviour sufficient to ensure the satisfaction of both efficacy and outcome expectancies (i.e., self-fulfilling prophecy).

Research has demonstrated that self-efficacy beliefs are particularly pertinent in influencing academic motivation, learning, and achievement (Schunk & Pajares, 2002). Self-efficacy is further theorized to positively influence task choice, effort, and persistence (Bandura, 1986; Schunk & Pajares, 2002). For example, Bandura (1997) highlighted that “the stronger the perceived self-efficacy, the higher the goals people set for themselves and the firmer their commitment to them” (p. 116). Additionally, research has shown that self-efficacy exerts a direct effect on subject-specific achievement (i.e. skill) and that instructional treatment (i.e., teacher behaviour toward students and curriculum) has both a direct and indirect effect on achievement through self-efficacy (Schunk & Pajares, 2002; Schunk, 1984; see Figure 4).

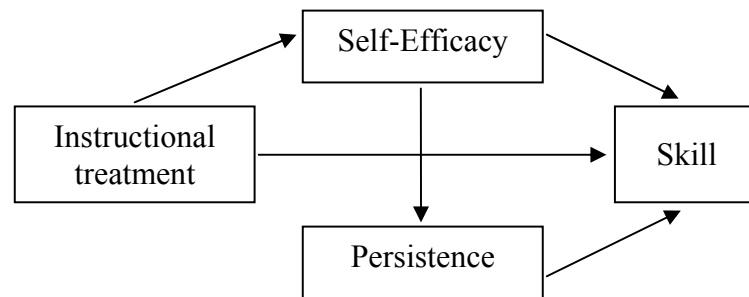


Figure 4. Mediating role of perceived self-efficacy in the mastery of competencies (adapted from Schunk, 1984, p. 51)

With respect to health promotion, both Bandura (1997) and Pate and colleagues (2006) suggested that lifelong health habits can be formed during childhood and that schools represent an advantageous place for early intervention. In addition, research has demonstrated that young people with high self-efficacy beliefs are more likely to form intentions to participate in leisure-time physical activity (Hagger, Chatzisarantis, & Biddle, 2001). Furthermore, evidence from a recent randomized controlled trial indicated that enhancing self-efficacy results in increased levels of physical activity participation for adolescent girls (Dishman et al., 2004). Although less research has been conducted in elementary schools, findings are consistent with the premise that

self-efficacy is a significant predictor of physical activity participation within that population as well (Chase, 2001; Trost, Pate, Saunders, Ward, Dowda, & Felton, 1997).

Of particular relevance to the current thesis, research has also provided evidence that transformational leadership can elevate followers' self-efficacy beliefs. 'Idealized influence' involves effective role modeling (i.e., vicarious experiences), and 'inspirational motivation' parallels Bandura's notion of verbal persuasion. Shamir, House, and Arthur (1993) purported that transformational leadership increases self-efficacy through "expressing positive evaluations, communicating higher performance expectations ... and showing confidence in followers' ability to meet such expectations" (p. 584). Several researchers have demonstrated that transformational leaders elevate self-efficacy beliefs among others (Bass, 1985; Kark et al., 2003), which in turn enhances organizational performance quality (Kirkpatrick & Locke, 1996). Pillai and Williams (2004) further demonstrated that the transformational leadership process works to influence performance outcomes through the mediating role of self-efficacy. Considering the potential benefits of improved self-efficacy to improve persistence intentions and effortful behaviour, the current study sought to investigate the relationship between transformational teaching behaviours as displayed by elementary school physical education teachers and students' self-efficacy beliefs to succeed in physical education. Thus, it was hypothesized that:

***Hypothesis 4:** There will be a positive relationship between transformational teaching and student self-efficacy for physical education.*

Attitudes

Salient beliefs regarding a given context determine an individual's attitudes toward that context (Ajzen, 1988). These attitudes can be positive or negative and can vary in intensity.

Attitudes are powerful influences which affect a person's decision making, particularly towards engaging in a given behaviour or activity, and are underpinned by the expectation that participation will result in certain outcomes (Solomon, 2003). With the knowledge that attitudes are central to the formation and modification of habits (Ronis, Yates, & Kirscht, 1989), it is essential to examine students' attitudes toward physical education. For the purpose of this thesis, student attitudes toward physical education were conceptualized in terms of students' *interest/value* in and *perceived usefulness* of the subject (cf., Papaioannou, 1994). This conceptualization of attitudes parallels Eccles and colleagues' (1983) concept of subjective task value, which reflects students' incentives for undertaking different tasks.

It is reasonable to assume that unless a task or activity has some inherent value, it is unlikely to stimulate participation. To that end, Wigfield and Eccles (1993) identified four aspects of task values, including attainment value (i.e., importance of doing well on a task), utility value (i.e., reflecting how the task relates to future goals), intrinsic value (i.e., enjoyment derived from the activity), and perceived cost (i.e., potential negative aspects of the activity). Task value has consistently shown to be an important predictor of children's task choices and task persistence (Eccles et al., 1983; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Midgley, Feldlaufer, & Eccles, 1989). In addition, student perceptions of the importance, usefulness, and value of engaging in a task influences classroom achievement through the degree of effort expended in subject-specific activities (Brookhart, Walsh, & Zientarski, 2006). Perceived interest in a given school subject has also been shown to correlate with academic achievement, particularly as interest has a substantial effect on subsequent course selection (Koller, Baumert, & Schnabel, 2001).

In terms of the antecedents of the focal attitudinal constructs assessed in this study, previous research has demonstrated that students are more likely to value a school subject when certain environmental or social factors are present. In particular, interest, value, and enjoyment

are enhanced when students perceive class environments as supportive (Midgley et al., 1989), encouraging of student involvement through choice (Papaioannou, 1994), and when students' self-perceived competence is developed (Jacobs et al., 2002; Koller et al., 2001). Indeed, in many respects these factors closely mirror the fundamental tenets provided by self-determination theory (Deci & Ryan, 1985), whereby psychological need satisfaction mediates the relationship between social influences and motivational outcomes. Indeed, it seems likely that psychological need satisfaction will enhance students' attitudes (i.e., interest/value, and perceived usefulness) toward physical education in a manner similar to the mediation model expressed by self-determined motivation (Jacobs et al., 2002). Specifically, students' attitudes corresponding to interest, value and usefulness are likely to be bolstered when their psychological needs (for autonomy, competence, and relatedness) are satisfied.

Teacher interaction with students has been highlighted as an important factor contributing to student attitude formation (Aicinena, 1991). Specifically, students model subject-specific attitudes of teachers, such that teachers with favourable attitudes are more likely to have students with favourable attitudes and high achievement in subject-specific contexts (Phillips, 1973). Furthermore, and in line with educational research which highlights that the quality of student/teacher relationships is associated with students' attitudes toward school (Midgley et al., 1989), transformational leadership research has been connected with adaptive follower attitudes in work place settings. In particular, Purvanova and colleagues (2006) suggested that task characteristics are socially constructed, whereby individuals use information from their social context to make judgments and develop perceptions of the meaningfulness and importance of given tasks. From this perspective, leaders can be considered potent sources of social information that can affect followers' attitudes about their tasks. Purvanova et al. (2006) further linked this social information processing approach with Bass' (1985) theoretical suggestions that inspiring leaders energize followers about the importance of their work (i.e.,

task significance), and found that transformational leaders positively influenced followers' perceived job characteristics. Drawing from this theoretical basis, a relationship was hypothesized to exist between teachers' demonstration of transformational behaviours and students' attitudes of interest/value in and perceived usefulness of physical education. Specifically, it was hypothesized that:

***Hypothesis 5:** Transformational teaching will be positively related to student attitudes toward physical education, in particular with regard to interest/value (Hypothesis 5a) and perceived usefulness (Hypothesis 5b).*

***Hypothesis 6:** Psychological need satisfaction will mediate the relationship between transformational teaching and student attitudes toward physical education, in particular with regard to interest/value (Hypothesis 6a) and perceived usefulness (Hypothesis 6b).*

Academic Enablers

One final outcome considered particularly important in physical education settings corresponds to the role of academic enablers. Academic enablers represent a set of adaptive processes that enable students to develop their academic skills, and ultimately facilitate learning (DiPerna & Elliott, 2000). Considering the active and dynamic nature of physical education, it is particularly important to consider those actions and cognitions which might support student development. Academic enablers are defined as the “attitudes and behaviours that allow a student to participate in, and ultimately benefit from, academic instruction in the classroom” (DiPerna & Elliott, 2000, p. 4). Academic enablers have been shown to positively correlate with proficiencies of achievement test scores (e.g., reading, math, language), and students' social skills (DiPerna & Elliott, 1999). Academic enablers have also been shown to significantly contribute to academic achievement beyond the influence of previous achievement

(DiPerna, Volpe, Elliott, 2002). In particular, academic enablers have been highlighted as mediating variables between classroom instruction and achievement (Greenwood, 1996). Specifically, the impact of classroom instruction on the development of students' subject-specific skills can be enhanced, or inhibited, by students' academic enablers (DiPerna, 2006). In addition, students' development and use of academic enablers are influenced by the effectiveness of instruction (i.e., teaching practices).

The academic enabler construct consists of four inter-related, but conceptually distinct, dimensions, namely motivation, study skills, interpersonal skills, and engagement (DiPerna & Elliott, 2000). In light of the application of Deci and Ryan's (1985) self-determination theory to the current study, and the pedagogy implicit within physical education (i.e., whereby homework is typically not assigned), DiPerna and Elliott's domains of motivation and study skills were not assessed in the current study. Instead, the behavioural dimensions of *interpersonal skills* and *engagement* were of particular interest, given that student learning and effective development is often dependent on successful cooperation with peers, respect for teachers, and participation in academic activities (Rink, 2003). The theoretical links between transformational teaching and these two dimensions are outlined below.

Interpersonal Skills

Gresham and Elliott (1984) defined social skills as "learned behaviours that enable a person to interact with others in ways that elicit positive responses and assist in avoiding negative responses" (p. 293). Conceptualized as a key component of the academic enabler construct, interpersonal skills include getting along with others, working well in groups, interacting with adults, correcting behaviour, following rules, and accepting suggestions (DiPerna & Elliott, 2000). Interpersonal skills are theorized to enhance academic performance through adaptive behaviours in school (Wentzel & Watkins, 2002). To explain the mechanisms

that underpin this effect, DiPerna and colleagues (2002) reasoned that “children who have higher levels of interpersonal skills are more likely to have positive experiences in the classroom environments. These positive experiences, in turn, result in increased drive on the part of that child to be successful in that environment” (p. 301). Specifically, acceptance by peers has been related positively to satisfaction with school, perceived academic competence, and the pursuit of goals to learn and to behave in socially appropriate ways (Wentzel & Asher, 1995). Furthermore, students who interpret peer relationships to be positive tend to be more engaged in adaptive aspects of classroom life, pursue prosocial and academic goals more frequently, and earn higher grades than students who do not perceive such support (Wentzel & Watkins, 2002). DiPerna and Elliott (1999) demonstrated that interpersonal skills are negatively related with students’ problem behaviours.

In relation to the antecedents of interpersonal skills, research has highlighted that teachers can enhance student perceptions of supportive environments, which in turn can facilitate positive relationships in the classroom. Furthermore, positive interactions with teachers and peers can promote students’ adoption of classroom goals (Wentzel & Watkins, 2002). Within organizational domains, transformational leadership has been shown to foster acceptance of common objectives and promote personalized commitment to assigned tasks (Podsakoff, MacKenzie, & Bommer, 1996). Similarly, research has highlighted the positive influence of transformational leadership on followers’ citizenship behaviours (such as cooperation/helping, and following rules; Purvanova et al., 2006). This literature informs the present study as interpersonal skills are highlighted to be worthwhile, adaptive behaviours in students which can be influenced by teacher behaviours. Specifically, it was hypothesized that:

Hypothesis 7: There will be a positive relationship between transformational teaching and student interpersonal skills in physical education.

Engagement

Greenwood, Horton, and Utley (2002) defined engagement as students' active participation in the classroom. DiPerna and Elliott (2000) conceptualized this component of academic enablers as including the following classroom behaviours: asking and answering questions, volunteering for tasks, participating in class discussions and activities, and assuming leadership in group situations. These behaviours are considered modifiable; specifically influenced by instruction, and how the teacher organizes instructional opportunities for the student to respond to the curriculum. The construct of engagement evolved from research on academic responding, whereby active behaviours (such as reading, writing, volunteering, and attending to instruction) were found to be positively associated with achievement (Cobb, 1972; Greenwood, Delquadri, & Hall, 1984).

Engagement has been highlighted to mediate the relationship between instruction and school outcomes (DiPerna et al., 2002; Greenwood et al., 2002). Furthermore, intervention research has indicated that teachers can readily increase students' levels of academic engagement if they focus on individual students rather than groups and if students are encouraged to discuss academic content (Greenwood et al., 2002). These teacher behaviours mirror the transformational leadership dimensions of individualized consideration and intellectual stimulation (Bass & Riggio, 2006). This link can be further supported from previous research in organizational settings where increases in active engagement (e.g., high levels of follower activity, initiative, and responsibility; Kelley, 1992) were established through the presence of transformational behaviours in military leaders (Dvir et al., 2002). By applying the basic tenets of transformational leadership theory to educational settings, a link can be drawn from the teachers' displays of transformational behaviour to students' development of engagement. Thus it was hypothesized that:

Hypothesis 8: *There will be a positive relationship between transformational teaching and student engagement in physical education.*

Figure 5 presents a model of the hypothesized relationships between classroom instruction (i.e. transformational teaching), and student motivation, self-efficacy, attitudes and enabling behaviours that were examined in this thesis.

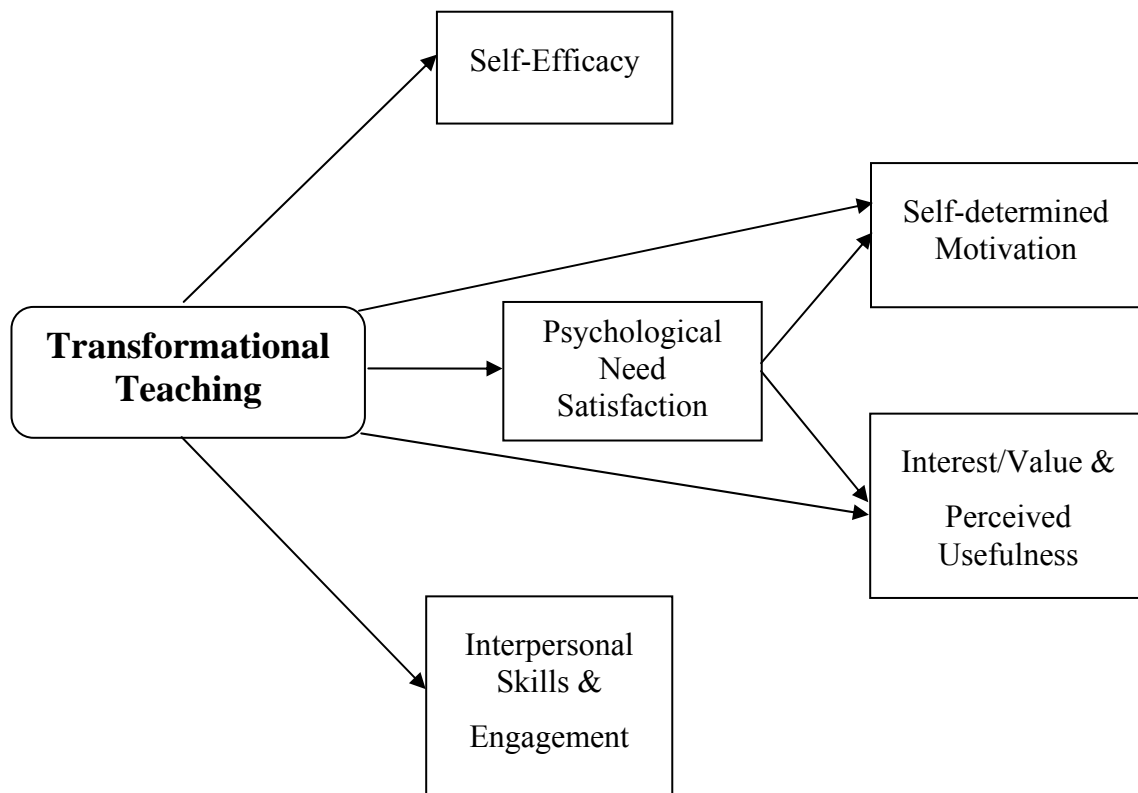


Figure 5. Hypothesized model of the relationships between transformational teaching, and student motivation, self-efficacy, attitudes, and enabling behaviours.

Chapter Two: Methods

Participants

Data were collected from 23 classes in the Vancouver School Board, British Columbia, Canada. To account for the diversity inherent in this part of Canada, participating schools were solicited based on their geographic location; the nine schools involved in this study represented 9 of the 23 distinct communities of Vancouver, BC (City of Vancouver, 2005). At Time 1, responses were obtained from 577 students. Of this group, 533 students (262 boys and 271 girls) provided data two months later (7.63% attrition over time). The demographic characteristics of the sample at the follow-up are displayed in Table 1.

Typically in the lower mainland of British Columbia, elementary school physical education is taught by the classroom teacher (V. Lee, Human Resources, Vancouver School Board, personal communication, July 18, 2008). Demographic data from our sample indicated that physical education classes were taught by 16 classroom teachers (9 male, 7 female), 3 other generalist teachers (2 male, 1 female), and 2 specialists (1 male, 1 female; both taught two participant classes).

Measures

Demographics. Demographic variables were queried for descriptive purposes as well as to facilitate matching of Time 1 and Time 2 surveys. Information collected included: birth date, birthplace (city and country), age, gender, school name, division (class name) and grade, as well as the first three digits of participants' postal code, and both their mother and fathers' occupation. Ethnic origin was captured by asking respondents to place a checkmark beside each ethnicity with which they identified; 21 options represented the most prevalent ethnicities in Vancouver according to the latest census (Statistics Canada, 2001).

Transformational Teaching. Student perceptions of transformational teaching were assessed using the Transformational Teaching Questionnaire (TTQ; Beauchamp et al., 2009). This measure is comprised of 16 questions designed to measure the four transformational dimensions of idealized influence, inspirational motivation, individualized consideration, and intellectual stimulation. Items are prefixed by: *The teacher I am rating...*, and use a 5-point rating scale with anchors ‘not at all’ (0), ‘once in a while’ (1), ‘sometimes’ (2), ‘fairly often’ (3), and ‘frequently’ (4). Example items are ‘Shows that s/he cares about me’ (Individualized Consideration), ‘Acts as a person that I look up to’ (Idealized Influence), ‘Is enthusiastic about what I am capable of achieving’ (Inspirational Motivation), and ‘Creates lessons that really encourage me to think’ (Intellectual Stimulation). The TTQ has a Flesch (1948) Readability score of 78.6, which is considered ‘fairly easy’ (Grade 4 reading ability; D’Alessandro, Kingsley, & Johnson-West, 2001). Beauchamp et al. (2009) reported that the most parsimonious model fit for the TTQ corresponded to four first-order factors that contribute to a higher-order latent factor termed *Transformational Teaching*. In this study, the higher-order conceptualization of the TTQ was operationalized (potential range of scores: 0-16), and demonstrated sound internal consistency ($\alpha = .94$).

Psychological Need Satisfaction. *Relatedness* was assessed using the scale developed by Richer and Vallerand (1998), that utilizes the following stem ‘*With the other students in this PE class I feel...*’, and includes ratings of five affective states (e.g., supported, understood, valued, safe, and listened to). *Competence* was assessed using the 5-item scale developed by McAuley, Duncan, and Tammen (1989) with an exemplar item being ‘I think I am pretty good at PE’. Finally, *autonomy* was measured using the 5-item scale developed by Standage, Duda, and Ntoumanis (2003). This scale uses the stem ‘*In this PE class...*’, with an example item being ‘I

have a say regarding what skills I want to practice'. Items for each of the three subscales are anchored by 'strongly disagree' to 'strongly agree' on a 7-point rating scale (1-7). The three scales demonstrated Flesch (1948) Readability scores between 85.0 and 91.0, which are considered 'easy' (Grade 3 reading ability; D'Alessandro, Kingsley, & Johnson-West, 2001). Each of these subscales demonstrated good internal consistencies ($\alpha > .85$) and moderate intercorrelations (ranging from .38 to .50) in the current study. Consistent with procedures outlined by Deci, Ryan, Gagne, Leone, Usunov, and Kornazheva (2001) a composite psychological need satisfaction (PNS) variable was derived by creating a mean score from these three subscales. Data derived from the composite need satisfaction scale also demonstrated good internal consistency ($\alpha = .89$).

Self-Determined Motivation. Students' motivational regulations were assessed using the Perceived Locus of Causality questionnaire developed by Goudas, Biddle, and Fox (1994). Items are prefixed by the stem '*I take part in this PE class...*', and a 7-point rating scale (1-7) is used with anchors ranging from 'strongly disagree' to 'strongly agree'. Example items include 'Because PE is fun' (Intrinsic Motivation), 'Because I want to learn sport skills' (Identified Regulation), 'Because I want the teacher to think I'm a good student' (Introjected Regulation), 'Because I'll get into trouble if I don't' (External Regulation), and 'But I don't really know why' (Amotivation). Each of these subscales demonstrated good internal consistency in the current study ($.72 < \alpha < .87$). The Perceived Locus of Causality questionnaire demonstrates a Flesch (1948) Readability score of 90.6, which is considered 'easy' (Grade 3 reading ability; D'Alessandro, Kingsley, & Johnson-West, 2001). Consistent with previous research (Ryan & Connell, 1989) a self-determination index (SDI) was calculated to provide an overall rating of self-determined motivation. SDI scores are generated using the formula: $SDI = (2 \times \text{intrinsic}) +$

identified - introjected - (2x external). The potential range of scores derived from the SDI is -18 to +18; with higher positive scores reflecting greater self-determined motivation (i.e., intrinsic value) and higher negative scores reflecting greater extrinsic motivation (i.e., external rewards).

Self-Efficacy. To measure students' perceptions of their competence to do their class work, an adapted version of the academic self-efficacy scale from the Patterns of Adaptive Learning Scales (Midgley et al., 2000) was used. This scale includes five items that are scored on a 7-point rating scale (1-7) with anchors ranging from 'not at all true' to 'very true'. Exemplar items include 'I'm certain I can master the skills taught in PE class this year', and 'I can do even the hardest work in my PE class if I try'. This self-efficacy scale has a Flesch (1948) Readability score of 96.0, which is considered 'very easy' (Grade 3 reading ability; D'Alessandro, Kingsley, & Johnson-West, 2001). Scoring involved taking the mean of all items. This scale demonstrated sound internal consistency ($\alpha = .90$) in the current study.

Attitudes. Students' attitudes toward physical education were assessed using Papaioannou's (1994) *Interest/Value* and *Perceived Usefulness* scales. Each scale is represented by 3 items, scored on a 7-point rating scale. The *Interest/Value* scale is comprised of items such as 'Generally, doing physical education in school is...' (1 = very boring, 7 = very interesting), and 'How much do you like the physical education lesson?' (1 = not at all, 7 = very much so). The *Perceived Usefulness* scale is comprised of items such as 'Generally, how useful is what you learn in the physical education lesson?' (1 = not useful at all, 7 = very useful). Scoring involved taking the mean of items comprising each scale. The potential range of scores is 1 to 7 for both scales; lower scores reflect less interest or perceived usefulness and higher scores reflect greater interest or perceived usefulness. The attitude scales have Flesch (1948) Readability scores of

56.9 (interest/value) and 49.6 (perceived usefulness), which are considered ‘fairly difficult’ (Grade 8 reading ability; D’Alessandro, Kingsley, & Johnson-West, 2001). In the present study, the alpha coefficient for interest/value in physical education was .82, and for perceived usefulness of physical education the alpha coefficient was .80.

Academic Enablers. To assess student behaviours that facilitate classroom learning, the academic enablers subscales corresponding to *Interpersonal Skills* and *Engagement* were adapted from the student forms of the Academic Competence Evaluation Scale (DiPerna & Elliott, 2000) for use within physical education. Items from this instrument are anchored by ‘never’ to ‘almost always’ on a 5-point rating scale (1-5). Ten items comprise the *Interpersonal Skills* scale, with exemplar items including ‘I work well in large groups of students’, and ‘I am able to correct my behaviour when my teacher asks’. Eight items comprise the *Engagement* scale, with exemplar items including ‘I volunteer to demonstrate in my class’, and ‘I ask questions when I am confused’. Scoring involves totalling the raw score for each scale, with potential scale ranges corresponding to 10-50 for Interpersonal Skills, and 8-40 for Engagement. The enabler subscales have Flesch (1948) Readability scores of 78.6 (interpersonal skills) and 77.9 (engagement), which are considered ‘fairly easy’ (Grade 4 reading ability; D’Alessandro, Kingsley, & Johnson-West, 2001). Both scales demonstrated good internal consistency ($\alpha > .83$) in the current study.

Procedure

Institutional Review Board and School Board approval were obtained prior to commencing the study (see Appendix A and B). Sixteen schools were randomly selected and approached for inclusion; nine schools accepted and seven schools declined for various reasons.

Participants were recruited by the principal investigator through initial contact with school principals and classroom teachers. The initial visit included a verbal announcement to classes about the project and information letter distribution to students (see Appendix C). Informed consent was obtained directly from students and consistent with recommendations provided by the Society for Adolescent Medicine (Santelli et al., 1995) passive consent was obtained from parents. Specifically, an information letter was sent home to parents with the students two weeks prior to data collection for the opportunity to opt their children out of the study (see Appendix D). The primary reason for utilizing passive consent was to ensure that a full range of students were able to participate in the study. Specifically, it is reasonable to assume that effective (i.e., transformational) teachers would be more likely to encourage a high return rate of completed parental consent forms, whereas less effective teachers would be less likely to encourage such returns. Furthermore, requiring parental consent places greater strain on school resources. There are also indications that parental consent is more likely to be obtained from students that are economically or educationally privileged, whereas passive consent is more likely to capture youth from ethnic minorities and single-parent homes (Dent, Galaif, Sussman, Stacy, Burtun, & Flay, 1993). It would potentially disadvantage these populations and undermine confidence in the study results if losses occurred from the original sample. Strong evidence exists that requiring active parental consent decreases subject participation rates (Dent, Sussman, & Stacy, 1997). In sum, and to ensure that a representative sample of children was obtained, passive consent procedures were implemented in this study with parents. Informed consent from students was denoted by students choosing to complete the survey packet.

When measuring perceptions of teachers' behaviours, it is important to avoid a honeymoon-hangover period, whereby students might initially rate new situations as overly appealing, followed by a marked reduction in rated attractiveness/effectiveness (Boswell, Boudreau, & Tichy, 2005). To allow for the normalization of affective reactions to new school

teachers, data collection occurred after the mid-year (Christmas) break. Specifically, questionnaire administration occurred in January and March, 2009. Questionnaires were completed independently by students in their respective classrooms; the survey packet (see Appendix E) took approximately 20-25 minutes to complete. On each occasion, students were informed of the voluntary nature of the study and were assured of confidentiality and anonymity.

Data Analysis

Preliminary analysis began with the identification of data entry error, patterns of missing data, and compliance with statistical assumptions. Attrition is a potential threat to internal validity if participant departure from the study represents genuine differences based on study variables; preliminary analysis confirmed that no group difference existed based on participant withdrawal. As such, cases were removed if no Time 2 data were provided. For cases with partial missing data (i.e., less than 50% per scale), within-person mean substitution was employed by manually entering the calculation into composite scores to ensure a more conservative estimate of internal consistency (Tabachnick & Fidell, 1996). Scatterplots with lines of best fit were constructed to determine bivariate normality between transformational teaching and each predicted variable (psychological need satisfaction, self-determined motivation, interest/value, perceived usefulness, interpersonal skills, and engagement). Descriptive statistics were calculated on all study variables, followed by the determination of univariate normality examined through skewness and kurtosis values. Bivariate correlations were also calculated between all study variables to determine patterns of associations. Finally, regression analysis was conducted to test the study hypotheses; particularly to assess the relationships between transformational teaching and the outcome variables of interest.

All statistics were computed with SPSS (Version 16.0.1). Significance levels were computed using $\alpha < .01$. A stringent p-value was used to minimize family-wise (Type I) error (Neyman & Pearson, 1967). The study involved a prospective observational design, in which the independent variable (transformational teaching), as assessed in January 2009 (Time 1), was examined in relation to the dependent variables of interest, as assessed in March 2009 (Time 2).

Analyses were performed on the entire sample, as opposed to separating by student gender, for the following two reasons. First, previous research has shown that physical education provides similar amounts of in-class physical activity for both boys and girls (Sarkin, McKenzie, & Sallis, 1997), and that similar motivational processes occur irrespective of gender (Ntoumanis, 2001). Second, a preliminary analysis of variance (ANOVA) revealed that there were no significant gender differences in students' perceptions of their teachers' transformational teaching behaviours ($F(1,527) = 1.19, p = .277$). Examination of the relationships between transformational teaching and the dependent variables of interest were also analyzed separately by gender and similar patterns emerged. For textual parsimony, results have been reported on the entire sample.

Chapter Three: Results

Preliminary Analysis

Students lost to follow-up at Time 2 were not significantly different from the final sample with respect to any of the demographic or determinant variables (in data collected at Time 1). Specifically, Time 1 data were analyzed with a one-way MANOVA with those that completed both data assessments and those that dropped out at Time 2 entered as the independent variables (i.e., groups based on Time 1 and Time 2 versus those that *only* completed questionnaires at Time 1) and all study variables included as dependent variables. The analysis revealed that there was no multivariate difference between the two groups ($F(8, 374) = 1.23, p = .28$; Wilks' $\lambda = .974$). Descriptive statistics for all study variables are reported in Table 2. Normality was demonstrated in scales for indices of psychological need satisfaction, motivation, and academic enablers. Results revealed minimal concerns over normality (skewness range -1.26 to -1.19; kurtosis range 1.06 to 1.34) for self-efficacy and interest/value. No apparent violation of bivariate normality was noted for interest/value following visual inspection of line of best fit (Tabachnick & Fidell, 1996). However, for self-efficacy, assumptions of normality failed the normal residual probability plot (whereby graph departs from, or “snakes” around, diagonal line; Tsai, Cai, & Xizhi Wu, 1998). Transformations were not successful in normalizing self-efficacy. Given that that self-efficacy was the only variable with notable normality issues and the *direction* of the skew was similar for both self-efficacy and transformational teaching, the non-transformed data were used in the current study.

Estimates of internal consistency (Cronbach's α ; Cronbach, 1951) were calculated to test the reliability of scores derived from the transformational teaching questionnaire, psychological need satisfaction composite measure, motivation, interest/value in and perceived usefulness of physical education, as well as interpersonal skills and engagement. All scale reliabilities

exceeded the .70 value recommended by Nunnally (1978). Pearson bivariate correlations were calculated between indices of transformational teaching, need satisfaction, motivation, self-efficacy, attitudes, and academic enablers (see Table 3). Patterns of small to moderate correlations in the expected directions were found. Specifically, higher levels of transformational teaching were associated with higher levels of psychological need satisfaction ($r = .47$), self-determined motivation ($r = .45$), and interest/value ($r = .49$) in physical education. Also, psychological need satisfaction was moderately correlated with self-determined motivation ($r = .58$) and the attitude scales of interest/value ($r = .65$) and perceived usefulness ($r = .61$).

Given the high intercorrelations among dimensions of the four transformational behaviours in both the organizational (Carless, 1998) and more recently the educational literature (Beauchamp et al., 2009), intercorrelations among the four dimensions were examined (see Table 4). In the current study intercorrelations among the four transformational teaching dimensions ranged from .70 to .80. Barling et al. (in press) have suggested (in relation to the Multi-factor Leadership Questionnaire within organizational settings) such high interfactor correlations among the transformational leadership dimensions may not simply reflect a measurement issue. That is, when leaders (in workplace settings) are transformational, it is highly likely that they will make use of several behaviours simultaneously (Barling et al., in press). Indeed, within educational contexts Beauchamp et al. (2009) explained that when teachers show genuine interest in the progress of a student (individualized consideration), they are also likely to suggest appropriate challenges to pursue (intellectual stimulation), energize those students to achieve their goals (motivational inspiration), and also model desirable behaviours and attitudes (idealized influence). In light of the high correlations between scores derived from these four subscales, the higher-order conceptualization of the TTQ was operationalized in this study. This is also consistent with the approach taken by Beauchamp et

al. (2009). As such, multicollinearity diagnostics were not conducted as the current study had only one predictor variable.

Relationship between Transformational Teaching and Student Motivation in Physical Education

To examine the relationship between transformational teaching and student motivation in physical education, self-determined motivation was regressed on transformational teaching. Following this preliminary analysis, further regression analyses were conducted to investigate the potential mediational effect of psychological need satisfaction in explaining the relationship between transformational teaching and self-determined motivation.

Relationship between Transformational Teaching and Self-determined Motivation. To examine the relationship between transformational teaching and self-determined motivation in physical education, the self-determination index (SDI; Time 2) was regressed on transformational teaching (Time 1). Transformational teaching was positively related to self-determined motivation ($\beta = .45$, adjusted $R^2 = .20$, $F(1, 526) = 135.29$, $p < .001$).

Relationship between Transformational Teaching and Psychological Need Satisfaction. To examine the relationship between transformational teaching and psychological need satisfaction, psychological need satisfaction (PNS; Time 2) was regressed on transformational teaching (Time 1). Transformational teaching was positively related to psychological need satisfaction ($\beta = .46$, adjusted $R^2 = .21$, $F(1, 527) = 144.72$, $p < .001$).

Relationship between Psychological Need Satisfaction and Self-determined Motivation. To examine the relationship between psychological need satisfaction and self-determined motivation, the self-determination index (Time 2) was regressed on psychological need

satisfaction (Time 2). Psychological need satisfaction was positively related to self-determined motivation ($\beta = .58$, adjusted $R^2 = .33$, $F(1, 530) = 264.85$, $p < .001$).

Psychological Need Satisfaction as a Mediator of the Relationship between Transformational Teaching and Self-determined Motivation. Based on Baron and Kenny's (1986) guidelines for testing mediation, regression analyses were conducted to examine psychological need satisfaction as a mediator of the relationship between transformational teaching and self-determined motivation in physical education. Baron and Kenny suggested that first, the dependent variable should be regressed on the independent variable; second, the mediator should be regressed on the independent variable; third, the dependent variable should be regressed on the mediator; and fourth, the dependent variable should be hierarchically regressed on the mediator and then the independent variable. Results of the analysis are presented in Table 5.

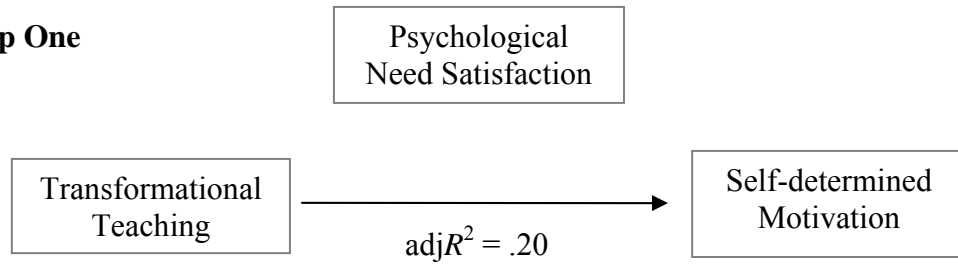
In the first equation, transformational teaching accounted for significant variance (adjusted $R^2 = .20$, $p < .001$) in self-determined motivation. In the second equation, transformational teaching accounted for a significant variance (adjusted $R^2 = .21$, $p < .001$) in psychological need satisfaction. In the third equation, psychological need satisfaction accounted for significant variance (adjusted $R^2 = .33$, $p < .001$) in self-determined motivation. In the fourth equation, psychological need satisfaction explained 33% of the variance ($p < .001$) in self-determined motivation. After controlling for the effect of psychological need satisfaction, transformational teaching contributed an additional 4% of the explained variance ($p < .001$) in self-determined motivation. Thus, partial mediation was supported (see Figure 6), whereby the relationship between transformational teaching and self-determined motivation was reduced when the effects of the mediator (psychological need satisfaction) were controlled (Baron & Kenny, 1986).

Specifically, partial mediation occurs when the relationship between independent and dependent variables is reduced (not eliminated) by the effects of the mediator. This indicates that (a) the independent variable is able to explain unique variance in the dependent variable, and (b) there may be additional mediating variables not accounted for in the equation. In contrast, full mediation occurs when the relationship between the independent and dependent variables is reduced to zero by the added effects of the mediator, whereby the mediator accounts for the entire relation between the predictor and the criterion (Baron & Kenny, 1986). Although full mediation represents the strongest evidence for a single, dominant explanatory mechanism, this is not necessarily practical in social psychology. Instead, a more realistic goal may be to seek mediators that significantly reduce rather than eliminate the amount of explained variance (Baron & Kenny, 1986). In sum, Hypothesis 1, 2, and 3 were supported in this study.

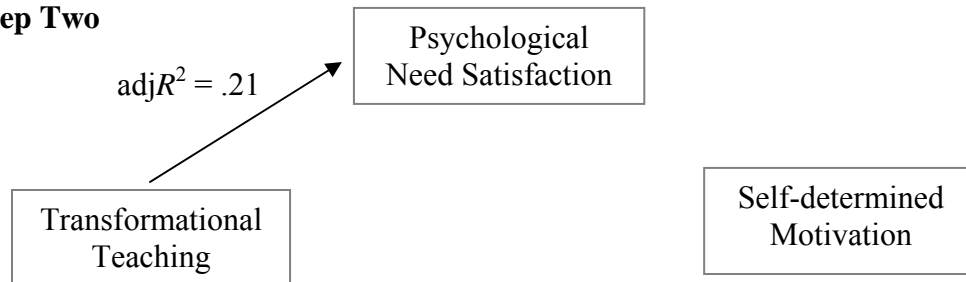
Relationship between Transformational Teaching and Self-Efficacy in Physical Education

To examine the relationship between transformational teaching and self-efficacy, self-efficacy (Time 2) was regressed on transformational teaching (Time 1). Transformational teaching was positively related to self-efficacy ($\beta = .26$, adjusted $R^2 = .07$, $F(1, 526) = 37.99$, $p < .001$). Thus, Hypothesis 4 was supported.

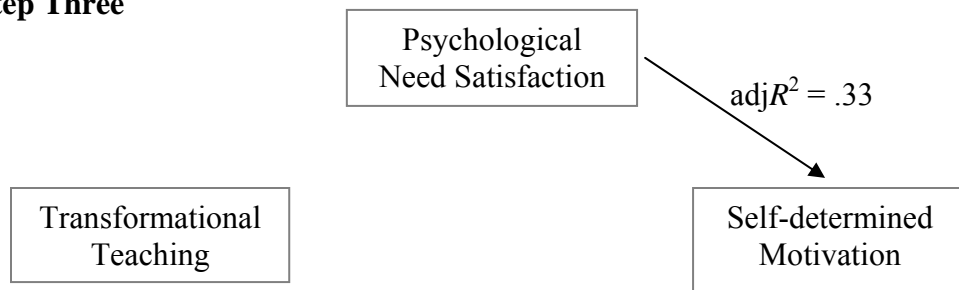
Step One



Step Two



Step Three



Step Four

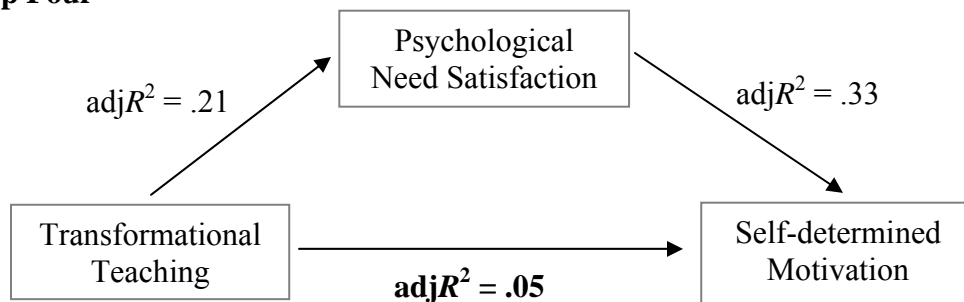


Figure 6. Psychological need satisfaction as a mediator of the relationship between transformational teaching and self-determined motivation

Relationship between Transformational Teaching and Student Attitudes toward Physical Education

To examine the relationship between transformational teaching and student attitudes in physical education, interest/value and perceived usefulness were regressed on transformational teaching. Following these preliminary analyses, further regressions were conducted to investigate the potential mediational effect of psychological need satisfaction in explaining the relationship between transformational teaching and these attitudes.

Relationship between Transformational Teaching and Interest/Value in Physical Education.

To examine the relationship between transformational teaching and interest/value in physical education, interest/value (I/V-PE; Time 2) was regressed on transformational teaching (TFT; Time 1). Transformational teaching was positively related to interest/value ($\beta = .50$, adjusted $R^2 = .25$, $F(1, 527) = 174.73$, $p < .001$).

Relationship between Psychological Need Satisfaction and Interest/Value in Physical

Education. To examine the relationship between psychological need satisfaction and interest/value in physical education, interest/value (Time 2) was regressed on psychological need satisfaction (Time 2). Psychological need satisfaction was positively related to interest/value in physical education ($\beta = .65$, adjusted $R^2 = .42$, $F(1, 531) = 384.85$, $p < .001$).

Psychological Need Satisfaction as a Mediator of the Relationship between Transformational Teaching and Interest/Value in PE.

Using Baron and Kenny's guidelines, as described above, a series of linear regression analyses were conducted to examine psychological need satisfaction as a mediator of the relationship between transformational teaching and interest/value in physical education. Results of the analysis are presented in Table 6. In the first equation, transformational teaching accounted for significant variance (adjusted $R^2 = .25$, $p < .001$) in interest/value in physical education. In the second equation, transformational teaching

accounted for a significant variance (adjusted $R^2 = .21$, $p < .001$) in psychological need satisfaction. In the third equation, psychological need satisfaction accounted for significant variance (adjusted $R^2 = .42$, $p < .001$) in interest/value in physical education. In the fourth equation, psychological need satisfaction explained 42% of the variance ($p < .001$) in interest/value in physical education. After controlling for the effect of psychological need satisfaction, transformational teaching contributed an additional 5% of the explained variance ($p > .001$) in interest/value in physical education. Thus, partial mediation was supported (see Figure 7). That is, the relationship between transformational teaching and interest/value in physical education was reduced substantially when the effects of the mediator (psychological need satisfaction) were controlled (Baron & Kenny, 1986). In sum, Hypotheses 5a and 6a were supported in this study.

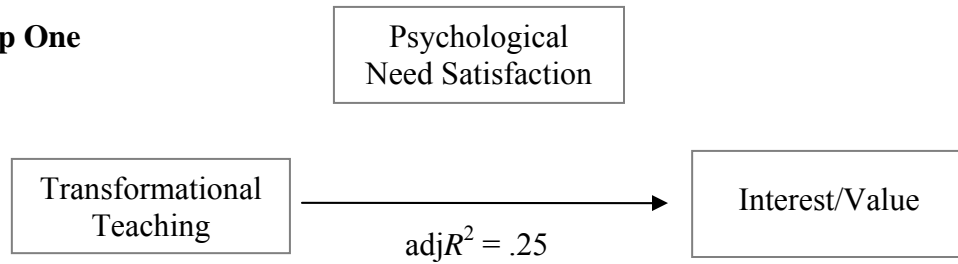
Relationship between Transformational Teaching and Perceived Usefulness of Physical

Education. To examine the relationship between transformational teaching and perceived usefulness of the physical education lesson, perceived usefulness (PU-PE; Time 2) was regressed on transformational teaching (Time 1). Transformational teaching was positively related to perceived usefulness ($\beta = .40$, adjusted $R^2 = .16$, $F(1, 527) = 101.45$, $p < .001$).

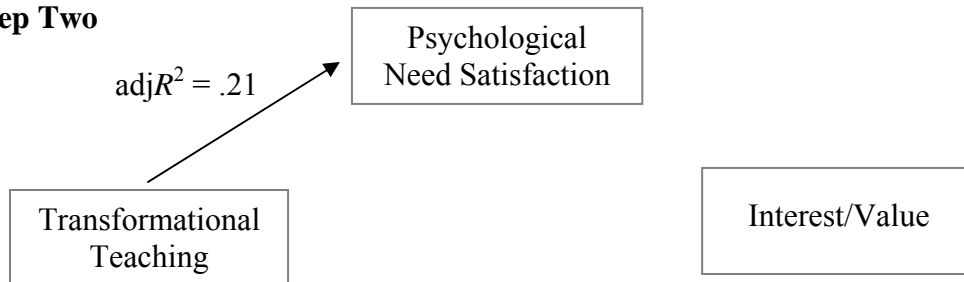
Relationship between Psychological Need Satisfaction and Perceived Usefulness of Physical

Education. To examine the relationship between psychological need satisfaction and perceived usefulness of physical education, perceived usefulness (Time 2) was regressed on psychological need satisfaction (Time 2). Psychological need satisfaction was positively related to perceived usefulness of physical education ($\beta = .61$, adjusted $R^2 = .37$, $F(1, 531) = 315.48$, $p < .001$).

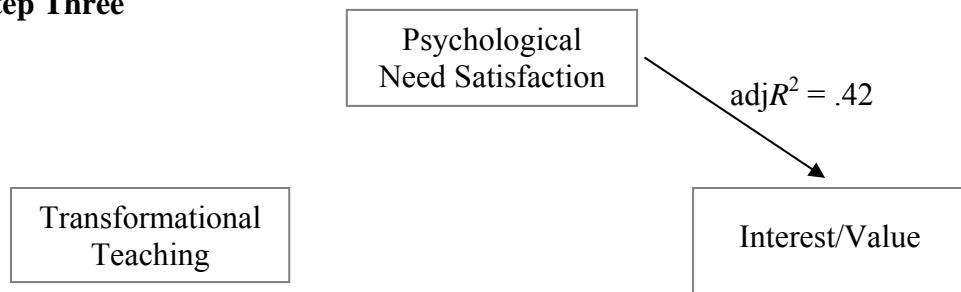
Step One



Step Two



Step Three



Step Four

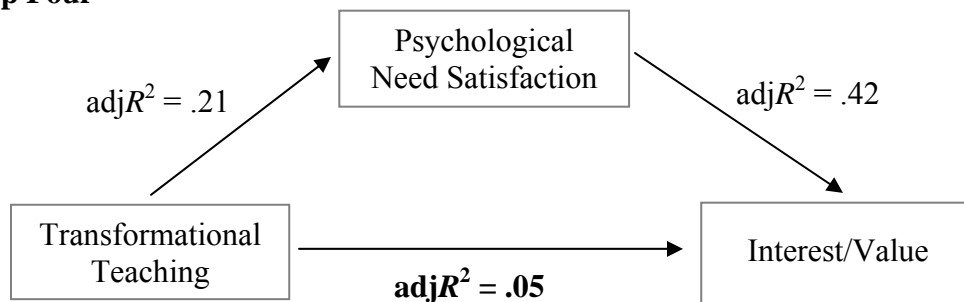


Figure 7. Psychological need satisfaction as a mediator of the relationship between transformational teaching and interest/value in PE

Psychological Need Satisfaction as a Mediator in the Transformational Teaching – Perceived Usefulness of PE Relationship. Following Baron and Kenny’s recommendations once more, a series of regression analyses were conducted to examine psychological need satisfaction as a mediator of the relationship between transformational teaching and perceived usefulness of physical education. Results of the analysis are presented in Table 7. In the first equation, transformational teaching accounted for significant variance (adjusted $R^2 = .16, p < .001$) in perceived usefulness of physical education. In the second equation, transformational teaching accounted for a significant variance (adjusted $R^2 = .21, p < .001$) in psychological need satisfaction. In the third equation, psychological need satisfaction accounted for significant variance (adjusted $R^2 = .37, p < .001$) in perceived usefulness of physical education. In the fourth equation, psychological need satisfaction explained 37% of the variance ($p < .001$) in perceived usefulness of physical education. After controlling for the effect of self-determined motivation, transformational teaching contributed an additional 2% of the explained variance ($p > .001$) in interest/value in physical education. Thus, partial mediation was supported (see Figure 8); the relationship between transformational teaching and perceived usefulness of physical education was reduced substantially when the effects of the mediator (psychological need satisfaction) were controlled (Baron & Kenny, 1986). In conclusion, Hypotheses 5b and 6b were supported in this study.

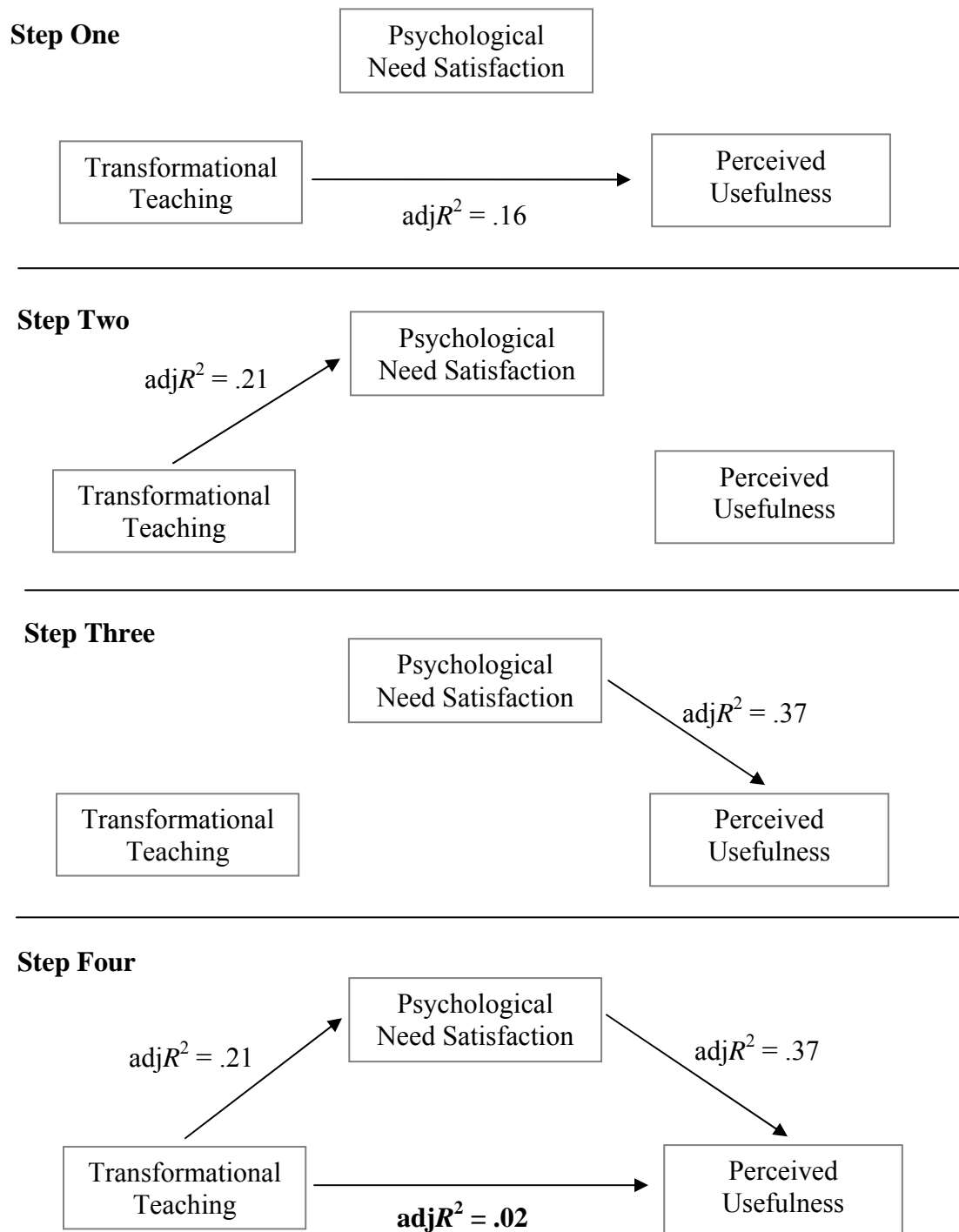


Figure 8. Psychological need satisfaction as a mediator of the relationship between transformational teaching and perceived usefulness of PE

Relationship between Transformational Teaching and Academic Enablers in Physical Education

To examine the relationship between transformational teaching and student enabling behaviours in physical education, interpersonal skills and engagement were regressed on transformational teaching.

Relationship between Transformational Teaching and Interpersonal Skills in Physical Education. To examine the relationship between transformational teaching and interpersonal skills in physical education, interpersonal skills (Time 2) was regressed on transformational teaching (Time 1). Transformational teaching was positively related to interpersonal skills ($\beta = .34$, adjusted $R^2 = .11$, $F(1, 523) = 67.09$, $p < .001$). Thus, Hypothesis 7 was supported.

Relationship between Transformational Teaching and Engagement in Physical Education.

To examine the relationship between transformational teaching and engagement in physical education, engagement (Time 2) was regressed on transformational teaching (Time 1).

Transformational teaching was positively related to engagement ($\beta = .34$, adjusted $R^2 = .12$, $F(1, 523) = 68.83$, $p < .001$). Thus, Hypothesis 8 was supported.

Chapter Four: Discussion

The research conducted within this thesis adds to a growing body of research which suggests that transformational teaching represents a salient construct for understanding youth involvement in school-based physical education. In terms of the accumulated research evidence to date, Morton and colleagues (in press) utilized a qualitative approach to identify the extent to which transformational teaching could be conceptualized within educational contexts. Building on this preliminary investigation, Beauchamp and colleagues (2009) developed a reliable and valid instrument to assess transformational teaching, and found evidence for the predictive utility of measures derived from the TTQ in relation to student motivation and affective responses. The current investigation built on these two studies by (a) examining a younger population (i.e., elementary school students), and (b) utilizing a prospective observational design to examine the external validity of the transformational teaching construct. In sum, this study provides evidence to suggest that transformational teaching may be able to facilitate student involvement in school-based physical education.

Overall the results of this study revealed four main findings. First, the results indicated that transformational teaching was able to explain significant variance in student self-determined motivation, and that psychological need satisfaction mediated that relationship. Second, the results indicated that transformational teaching was able to explain significant variance in student self-efficacy. Third, the results indicated that transformational teaching was able to explain significant variance in student attitudes toward physical education, and that psychological need satisfaction mediated that relationship. Finally, the results illustrated that transformational teaching was able to explain significant variance in student enabling behaviours.

Comparison of Study Participants to those in Previous Research

This study included data derived from a moderately large sample ($N = 533$) and represented the diverse background of Vancouver communities. Participants included both male and female students with relative equivalence (49% male, 51% female), and reflected the racial composition of this area of Canada (Statistics Canada, 2001). Previous studies on transformational leadership in educational contexts have primarily considered university (Harvey et al., 2003) and secondary school (Beauchamp et al., 2009; Koh et al., 1995) environments. The Transformational Teaching Questionnaire was initially developed for use with adolescents (specifically grades 8-10), to examine their perceptions of physical education teachers' behaviours (Beauchamp et al., 2009). In comparison, the present study considered the application of transformational teaching within an elementary school setting. Scores derived from the TTQ in this study supported the application of transformational leadership theory to elementary school students, particularly as the Transformational Teaching Questionnaire demonstrated sound internal consistency (present study $\alpha = .94$).

It is important to note that physical education in Canada has distinct delivery systems in secondary versus elementary schools. Physical education in secondary schools is typically taught by specialists who generally display more effective context-specific (i.e., physical education) teaching behaviours, which lead to improved student achievement and attitudes (Rink & Hall, 2008). In comparison, elementary school physical education is generally led by classroom teachers, untrained in physical education, who must also balance the time demands of physical education with other academic subjects, which often results in irregular and/or insufficient programming allocation to physical education (Morgan & Hansen, 2008).

Predominant pedagogical models in physical education have examined the influence of class environments on motivation (Ames, 1992; Carr, 2006; Sarrazin, Vallerand, Guillet,

Pelletier, & Cury, 2002; Shen, Chen, & Guan, 2007), specifically highlighting the value of task (self-referent) orientations that result in positive and adaptive student outcomes (e.g., interest, learning, self-determined motivation). In addition, previous research has provided recommendations for structuring learning experiences (Epstein, 1988; Morgan & Kingston, 2008) to enhance adaptive motivational responses. The framework adopted in this study suggests that if teachers also make use of transformational behaviours they may be well placed to foster effective interactions with their students.

As previously noted, research applying transformational leadership theory to educational contexts has been limited to the effects of school principals' behaviours on teachers (Griffith, 2004; Nguni et al., 2006). Of particular note, this study can be considered against of concerns that principals' leadership behaviours contribute little to direct student outcomes and those with proximal involvement with students (i.e., class teachers) are more likely to influence student responses (Robinson et al., 2008). In summary, this investigation indicated that student perceptions of transformational teachers were positively associated with adaptive student cognitions, attitudes, and behaviours within elementary school physical education.

Transformational Teaching and Student Motivation

Previous studies that have examined adolescent physical education (Beauchamp et al., 2009) and collegiate athletic (Charbonneau et al., 2001) populations have shown small to moderate effects for transformational leadership behaviours in relation to self-determined motivation. Findings from the current investigation are consistent with these studies in this regard. From a transformational leadership perspective, a number of researchers have emphasized the utility of identifying potential mechanisms (i.e., mediators) through which transformational behaviours might influence others' behaviours and attitudes (Charbonneau et

al., 2001). This thesis drew from the theoretical tenets offered by self-determination theory (Deci & Ryan, 1985), and examined whether the satisfaction of students basic psychological needs (for competence, relatedness, and autonomy) mediated the relationship between transformational teaching and self-determined motivation.

Consistent with previous findings on the mediational mechanisms influencing the relationship between social factors and motivational outcomes (Ntoumanis, 2001; Standage & Vallerand, 2007), and providing support for Hypotheses 1 to 3, support for partial mediation was found. Specifically, psychological need satisfaction explained some, but not all, of the variance in the relationship between transformational teaching and self-determined motivation. Baron and Kenny (1986) defined a mediator as “the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest” (p. 1173). In the case of partial mediation the total effect of the independent variable in relation to the dependent variable is reduced, but not eliminated, when the effect of the mediator is taken into account. However, it is noteworthy that in this study transformational teaching maintained a small, yet statistically significant, direct contribution to variance explanation in self-determined motivation. This suggests that when elementary school teachers demonstrate transformational behaviours they may be able to *directly* increase student self-determined motivation as well as *indirectly* promote intrinsic motivation through the fulfillment of competence, relatedness, and autonomy needs. Partial mediation also indicates that other mediators might be at play (Baron & Kenny, 1986). Although Deci and Ryan (2000) contend that satisfaction of competency, relatedness and autonomy represent three universal psychological needs necessary to influence motivation, other scholars have argued for the consideration of additional mechanisms (Sheldon, Elliot, Kim, & Kasser, 2001). In particular, an important avenue for future research on transformational teaching and student motivation would be to investigate potential mediating

effects of other variables such as self-esteem (Sheldon et al., 2001), goal orientations (Ferrer-Caja & Weiss, 2000), and/or outcome expectancies (Goudas, Dermitzaki, & Bagiatis, 2000).

Transformational Teaching and Student Self-Efficacy

To further investigate the potential role of transformational teaching in relation to student involvement in physical education, one aspect of Bandura's (1986) social cognitive theory was employed to examine self-efficacy as a criterion variable. Self-efficacy beliefs have been highlighted as particularly pertinent in influencing learning, achievement, task choice, effort, and persistence (Bandura, 1986; Schunk & Pajares, 2002). Furthermore, research has shown that teacher behaviour toward students can directly influence student self-efficacy (Schunk & Pajares, 2002). Consistent with research in the organizational domain (Kark et al., 2003), and supportive of Hypothesis 4, a statistically significant (albeit small) relationship was found between transformational teaching and student self-efficacy beliefs in physical education. The magnitude of this effect is in line with results of previous research in educational studies of school-wide physical activity interventions (Dishman et al., 2004), as well as organizational studies examining transformational leadership behaviours in relation to follower self-efficacy promotion (Pillai & Williams, 2004). Considering that Bandura (1997) highlighted personal mastery experiences as the most influential source of efficacy information, it is reasonable to expect that teacher interactions with students (e.g., role modeling, verbal persuasion) would elicit a smaller influence on self-efficacy beliefs than direct personal accomplishments. Nevertheless, with links to effort and achievement, self-efficacy represents a valuable cognition for promotion in children. As such, the implementation of strategies designed to bolster teachers' use of transformational teaching strategies, represents a potentially viable means of elevating self-efficacy beliefs among elementary school students.

Transformational Teaching and Student Attitudes toward Physical Education

In the pursuit of understanding transformational teachers' influence on student involvement in physical education, student attitudes toward physical education were assessed in this study. Attitudes can considerably influence involvement as positive or negative beliefs about a given context affect decision making (Solomon, 2003). Furthermore, student attitudes toward school (and physical education) can be impacted by their teachers' behaviours (Aicinena, 1991; Goudas & Biddle, 1994). Interestingly, Purvanova and colleagues (2006) found that transformational leaders can have a positive influence on followers' perceptions of task characteristics within organizational contexts. Consistent with this finding, transformational teaching was found to have a moderately small, statistically significant positive association in this study with both interest/value in physical education and perceived usefulness of physical education (Hypothesis 5).

Based on prior research (Jacobs et al., 2002) and theoretical expectancy-value models of achievement motivation (Eccles et al., 1983), the relationship between transformational teaching and attitudes toward physical education was also hypothesized to be mediated by psychological need satisfaction. In particular, individuals' competence beliefs have been shown to strongly associate with patterns of task value (Jacobs et al., 2002). Supportive of Hypothesis 6, psychological need satisfaction explained moderate variance in both interest/value in and perceived usefulness of physical education. The total effect of transformational teaching on the attitudinal dependent variables (interest/value in and perceived usefulness of physical education) was substantially reduced (from 25% to 5% and 16% to 2% respectively) when the effect of the mediator (psychological need satisfaction) was taken into account.

In spite of this evidence of (partial) mediation, it is also noteworthy that transformational teaching maintained a small, yet statistically significant, direct contribution to variance

explanation in both indices of student attitudes toward physical education. This suggests that teachers who display transformational teaching behaviours might be able to *directly* increase interest/value in and perceived usefulness of physical education as well as *indirectly* promote positive attitudes toward physical education through the fulfillment of students' basic psychological needs. In light of evidence that students model the subject-specific attitudes of their teachers (Phillips, 1973), a worthwhile direction for future research would be to investigate the potential mediating effects of teachers' attitudes toward physical education on the relationship between transformational teaching and student attitudes toward physical education.

Transformational Teaching and Academic Enabling Behaviours in Physical Education

The last relationship examined in this thesis corresponded to the relations between transformational teaching and the academic enabling dimensions of interpersonal skills and engagement (DiPerna & Elliott, 2000). These links were examined based on research which specified that the impact of classroom instruction on the development of students' subject-specific skills could be enhanced, or inhibited, by students' academic enabling behaviours (DiPerna, 2006). Although this study represents the first, to date, to examine the relationship between transformational teaching and student academic enablers directly, previous investigations have investigated (a) teachers' roles in facilitating environments that are supportive of interpersonal skills (Wentzel & Watkins, 2002) and engagement (Greenwood et al., 2002), as well as (b) the dynamic between transformational leadership in organizations and followers' citizenship behaviours (Purvanova et al., 2006) and engagement (Dvir et al., 2002). In line with the aforementioned studies and based on the theoretical tenets of transformational leadership theory (Bass & Riggio, 2006), results of this investigation supported Hypotheses 7

and 8. Specifically, transformational teaching was positively associated with students' reports of interpersonal skills and engagement in physical education. Although the effects of transformational teaching were relatively small, their practical significance warrants further enquiry.

Notwithstanding these positive outcomes, future research may also benefit from incorporating all four dimensions of the academic enabler framework. Specifically, DiPerna and Elliott's (1999) conceptualizations of *motivation* and *study skills* could be added to future investigations to better understand how transformational teaching might influence desirable *enabling* outcomes. In particular, research on the academic enabler framework suggests that these four dimensions interact with one another to mediate the relationship between instruction and academic achievement (DiPerna et al., 2002). In line with recommendations for researchers to explore models that compliment, extend, and synthesize existing knowledge (Duda & Hall, 2001), future research could apply the paradigm of transformational teaching to the full Academic Competence Evaluation framework (DiPerna & Elliott, 2000) to theoretically advance both models.

Limitations

In spite of the contributions of this thesis to the extant literature on transformational teaching and student involvement in physical education, the study is not without its limitations, and four primary considerations for future research are worth noting. First and foremost, the study was conducted within nine elementary schools within a large urban centre in Western Canada. Indeed, the generalizability of results from this study are limited to elementary school students from similar settings. Future research with rural schools, central and eastern Canadian

communities, and even international populations are encouraged to further ascertain the application of transformational leadership theory to youth physical education contexts.

Second, although great strides were taken to ensure that a representative sample of students was obtained from the geographical area of Vancouver, British Columbia, in future, additional issues concerning participant self-selection should be considered. Specifically, in light of the fact that some schools initially declined to participate in this investigation, it is possible that those that declined differed in some theoretically meaningful way from those that elected to participate (Bryman, 2004). It would be speculative to highlight what such factors might include, however in future, research is encouraged to ensure that a diverse and representative sample is derived from the population of interest.

A third limitation corresponds to the self-report nature of the measures used in this study. When both independent and dependent variables are assessed through self-report means, there is an increased likelihood of common method bias (i.e., variance attributed to measurement method rather than the constructs that the measures represent). In an attempt to mitigate such a phenomenon, common method bias was alleviated through the use of three strategies (cf., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). First, methodological separation was employed, whereby response formats varied in length and visual characteristics. Second, respondents were guaranteed anonymity and assured that there were no ‘right’ or ‘wrong’ answers; both techniques have been theorized to reduce evaluation apprehension. Finally, two time points were used in the analysis (Time 1 for independent variable and Time 2 for dependent variables) which ensured a theoretically appropriate temporal ordering of the predictor (cause) and criterion (effect) variables. To overcome the limitation of common method bias entirely, future research should consider objective outcome assessments of the study’s dependent measures (e.g., accelerometer) in conjunction with psychological self-reports.

A final limitation of the present study corresponds to the assumption of independence required for regression analysis (Tabachnick & Fidell, 1996). The current data were nested, whereby units were clustered into a hierarchy (e.g., students (level 1 units) nested within classes (level 2 units), classes nested within schools (level 3 units); Goldstein, 1995). Because schools are highly interdependent environments, interactions with the same teacher are likely to account for shared variance in student responses. Multilevel modelling (Goldstein, 1987, 1995) represents a statistical method that enables researchers to examine individual-level, group-level, and cross-level effects simultaneously. This study was underpowered at the class level to conduct multilevel modelling. Future work should seek to obtain a greater number of classes and schools to better understand the dynamics of transformational teaching within and between classes and schools.

Future Directions

Balanced against the aforementioned limitations, however, is the fact that the study does make a number of contributions to theory as well as to the extant educational and health promotion literature. That is, support was provided in this study for the application of transformational leadership theory to facilitate understanding of theoretical antecedents of student cognition, attitude, and behaviour within elementary school physical education settings. In particular, transformational teaching was positively associated with psychological need satisfaction, self-determined motivation, self-efficacy, interpersonal skills, engagement, interest in and perceived usefulness of physical education. The amount of variance in this study's dependent variables explained by transformational teaching was in the small to moderate range (7 – 47%). This suggests that other factors might be considered in future research to explain salient student outcomes in school settings. Other variables might include the specific course

content offered (e.g., games versus skill-based lessons, individual versus group activities), teachers' attitudes and instructional style (i.e., achievement motivation climates), individual physical attributes (i.e., height, weight, physical condition), family education, culture, and previous experiences of physical education.

Future research is also encouraged to investigate the relationship between transformational teaching and students' *actual* physical activity behaviours and/or other objectively measured health-related outcomes. In particular, use of accelerometers provides objective information concerning student levels of moderate-to-vigorous physical activity as well as the timing of such activities within the day (Rowlands, 2007). This recommendation is in line with the latest research utilizing objective measurement tools (e.g., pedometers) to account for levels of activity in physical education to better understand student motivation and involvement in physical education (Lonsdale et al., 2009). Research investigating the application of transformational teaching to student uptake of fundamental movement skills (e.g., run, jump, throw, catch) could shed light on of the developmental behaviours necessary to engage in long-term physical activity (Fisher et al., 2005).

A third direction for future research concerns Bandura's (2006) recommendation to measure self-efficacy with a greater degree of congruence with the context of interest than was employed in this study. In this thesis a general/omnibus measure of self-efficacy was used, which may have been restricted in its ability to reflect students' *specific* competencies in the context of physical education. From a measurement perspective Bandura (1997) argued that students will think differently about their capabilities if asked to judge their efficacy for a subject in general terms, in comparison to specific skills and competencies. To better understand the influence of transformational teaching on student self-efficacy, future research is encouraged to identify the most salient competencies required in physical education settings and assess

students' efficacy beliefs in relation to those discrete capabilities (e.g., fundamental movement skills).

In light of the fact that the study of transformational teaching represents a relatively new line of inquiry within pediatric and educational psychology, future research is also encouraged to consider alternative research methods to target distinct research questions. Along these lines, future studies could draw on a larger number of classes to examine potential teacher characteristics as possible moderators. Although demographic data were collected on teacher training (generalist versus PE specialist) and gender, the sample size at the teacher-level was too small to statistically evaluate teacher or class differences. To consider the teacher as the 'unit of analysis' would also invite the application of multilevel modelling (cf. Goldstein, 1987, 1995) to better understand cross-level effects between teacher behaviour and student perceptions of their class environment. From an alternative perspective, qualitative research with smaller samples could offer a greater depth of insight into the phenomenon of transformational teaching and answer the question 'what does transformational teaching look like'? Through observation and interviews with teachers, transformational teaching behaviours in physical education could be described, and philosophies and strategies for implementing transformational teaching dimensions could be illuminated.

Finally, based on the preliminary findings highlighted within the current study, future research should consider how to influence teachers to adopt and make greater use of transformational teaching behaviours. Intervention-based research creates stronger inferences of causality as the manipulation of experimental conditions provides confidence that differences between groups are due to the independent variable of interest (Bryman, 2004). Research has demonstrated that transformational leadership in organizational domains can be developed through training (Barling et al., 1996; Dvir et al., 2002). Consistent with professional development opportunities currently in place for in-service teachers, transformational teacher

training could potentially be delivered through one-day workshops. This approach has been used to good effect in various workplace settings (e.g., Barling et al, 1996). Consistent with recommendations by Kelloway and Barling (2000), transformational teaching interventions should encourage teachers that they can make a difference and empower students to achieve their goals (cf., Kelloway & Barling, 2000).

Practical Implications

From an applied perspective, the findings of this study suggest that physical education teachers in elementary school settings should be encouraged to foster transformational behaviours that model positive attitudes toward physical education, support individual students in their development of abilities, inspire and encourage students to participate, and stimulate students intellectually. By demonstrating that transformational teaching was positively related to adaptive cognitions, attitudes, and behaviours in physical education it is reasonable to assume that transformational teachers could make a difference to student physical activity participation outside of school. Specifically, initial efforts to examine transformational teaching found that students were more likely to report participation in leisure-time physical activity when they perceived transformational behaviours from their physical education teachers (Morton et al., in press). Research has also demonstrated that intrinsically motivated students are more likely to take up leisure-time physical activity when driven by autonomous motives (Hagger et al., 2009). Similarly, research has shown that young people with positive attitudes and high self-efficacy beliefs are more likely to form intentions to participate in leisure-time physical activity (Hagger et al., 2001). By extension, transformational teaching behaviours have the potential to impact student health and lifelong physical activity participation

Conclusion

Transformational teaching represents a theoretically relevant predictor of salient cognitive, attitudinal, and behavioural phenomena within elementary school physical education classes. Specifically, results derived from this investigation suggest that there is a positive association between transformational teaching and student self-determined motivation, self-efficacy, interpersonal skills, engagement, and interest/value in and perceived usefulness of physical education. Results also indicated that satisfaction of students' psychological needs served as an intervening variable in the relationship between transformational teaching and student self-determined motivation, as well as mediating the relationship between transformational teaching and student interest/value in and perceived usefulness of physical education. In summary, future research is clearly needed to examine the extent to which transformational teaching can be developed through intervention, and thereafter result in positive health-related outcomes for students.

Table 1

Demographic Characteristics of Participants at Time 2

	All	Boys	Girls
	(N = 533)	(N = 262)	(N = 271)
	%	%	%
Age			
10	3	3.5	4
11	59	60	58
12	34	33	34
13	4	3.5	4
Grade			
5	4	5	3
6	83	77	77
7	13	10	12
Birthplace			
Canada	75	73	76
China	9	10	7
Other	17	17	17

Table 2

Summary Statistics for Study Variables

Variable	<i>N</i>	Actual Range	<i>M</i>	<i>SD</i>
TIME ONE				
1. Transformational Teaching	571	0 - 16	11.09	3.27
TIME TWO				
2. Psychological Need Satisfaction	533	1.8 - 7	4.87	1.04
3. Self-determined Motivation	532	-14 - +18	5.27	6.09
4. Self-Efficacy	532	1 - 7	5.58	1.29
5. Interest/Value in PE	533	1 - 7	5.67	1.40
6. Perceived Usefulness of PE	533	1 - 7	5.22	1.34
7. Interpersonal Skills	529	21 - 50	40.52	6.04
8. Engagement	529	8 - 40	26.52	6.52

Table 3Intercorrelations between Study Variables ($N = 524$)

Variable	1	2	3	4	5	6	7	8
TIME ONE								
1. Transformational Teaching	-	.47	.45	.27	.49	.40	.34	.34
TIME TWO								
2. Psychological Need Satisfaction		-	.58	.68	.65	.61	.46	.48
3. Self-determined Motivation			-	.49	.61	.56	.28	.29
4. Self-Efficacy				-	.53	.52	.42	.43
5. Interest/Value in PE					-	.68	.37	.36
6. Perceived Usefulness of PE						-	.36	.34
7. Interpersonal Skills							-	.51
8. Engagement								-

Note. All correlations are significant, $p < .01$ (2-tailed)

Table 4Intercorrelations between Dimensions of Transformational Teaching ($N = 529$)

Variable	1	2	3	4
1. Inspirational Motivation	-	.79	.80	.75
2. Idealized Influence		-	.75	.73
3. Individual Consideration			-	.70
4. Intellectual Stimulation				-

Note. All correlations are significant, $p < .01$ (2-tailed)

Table 5

Mediational Analysis for Variables Predicting Motivation in Elementary Physical Education

Equation	Criterion	Predictor	<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²
1	SDI	TFT-1	153.29	(1, 526)	.20*
2	PNS	TFT-1	144.72	(1, 527)	.21*
3	SDI	PNS	264.85	(1, 530)	.33*
4	SDI				
	Step 1	PNS	265.21	(1, 526)	.33*
	Step 2	TFT-1	36.68	(1, 525)	.38*

Note. *N*=528. TFT-1 is the only time one variable. For Equation 4, Step 2 $\Delta R^2 = .05$.

SDI = self-determination index; TFT = transformational teaching; PNS = psychological need satisfaction.

* $p < .001$

Table 6

Mediational Analysis for Variables Predicting Interest/Value in Elementary Physical Education

Equation	Criterion	Predictor	<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²
1	I/V-PE	TFT-1	174.73	(1, 527)	.25*
2	PNS	TFT-1	144.72	(1, 527)	.21*
3	I/V-PE	PNS	384.85	(1, 531)	.42*
4	I/V-PE				
	Step 1	PNS	380.10	(1, 527)	.42*
	Step 2	TFT-1	49.79	(1, 525)	.47*

Note. *N*=529. TFT-1 is the only time one variable. For Equation 4, Step 2 $\Delta R^2 = .05$.

I/V-PE = interest/value in physical education; TFT = transformational teaching; PNS = psychological need satisfaction.

* $p < .001$

Table 7

Mediational Analysis for Variables Predicting Perceived Usefulness of Elementary Physical Education

Equation	Criterion	Predictor	<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²
1	PU-PE	TFT-1	101.45	(1, 527)	.16*
2	PNS	TFT-1	144.72	(1, 527)	.21*
3	PU-PE	PNS	315.48	(1, 531)	.37*
4	PU-PE				
	Step 1	PNS	308.44	(1, 527)	.37*
	Step 2	TFT-1	15.70	(1, 526)	.39*

Note. *N*=529. TFT-1 is the only time one variable. For Equation 4, Step 2 $\Delta R^2 = .02$.

PU-PE = perceived usefulness of physical education; TFT = transformational teaching; PNS = psychological need satisfaction.

* $p < .001$

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Appendix A ~ Research Ethics Board Approval from UBC



The University of British Columbia
Office of Research Services
Behavioural Research Ethics Board
Suite 102, 6130 Agropurify Road, Vancouver B.C. V6T 1Z3

CERTIFICATE OF APPROVAL- MINIMAL RISK RENEWAL

PRINCIPAL INVESTIGATOR:	DEPARTMENT:	UBC BRES NUMBER:
Mark R. Beauchamp	UBC/Education/Urban Kinetics	HC8-BC583
INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:		
Institution		Site
UBC		Vancouver (excludes UBC Hospital)
Other locations where the research will be conducted: N/A		
CO-INVESTIGATOR(S):		
N/A		
SPONSORING AGENCIES:		
Social Sciences and Humanities Research Council of Canada (SSHRC) - "Transformational Teaching in Physical Education: Instrument Development and Tests of Theory"		
PROJECT TITLE:		
Transformational Teaching in Physical Education: Instrument Development and Tests of Theory		
EXPIRY DATE OF THIS APPROVAL: September 17, 2009		
APPROVAL DATE: September 17, 2008		
The Annual Renewal for Study have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects		
<p>Approval is issued on behalf of the Behavioural Research Ethics Board</p> <p>Dr. M. Judith Lynskey, Chair Dr. Ken Craig, Chair Dr. Jim Rupert, Associate Chair Dr. Enrico Ford, Associate Chair Dr. Daniel Salneri, Associate Chair Dr. Anna Ho, Associate Chair</p>		

Appendix B ~ Agency Approval from Vancouver School Board



October 28, 2008

Dr. Mark Beauchamp
Assistant Professor, Michael Smith Foundation for Health Research Scholar
School of Human Kinetics
Auditorium Annex A, 1924 West Mall
University of British Columbia
Vancouver, B.C. V6T 1Z1

Dear Dr. Beauchamp,

Thank you for your research proposal "The Transformational Teaching Questionnaire: Preliminary tests of theory and construct validity." On behalf of the VSB Research Committee please accept this letter as approval for you to complete your research in Vancouver schools. You have permission to contact teachers, parents and students in the Vancouver district. We request that you make your initial contact with the principal of the school to inform them of your study and provide them with a copy of this letter. Please note that teachers and administrators are very busy with many obligations and that schools have the right of refusal to participate in any research studies. Also, the Vancouver School District does not find subjects for researchers.

The VSB Research Committee would be very interested in learning of your results and its implications for students. When your research is completed please send us an abstract of the results.

Thank you for focusing your work within the Vancouver School District. I wish you the best of luck as you proceed with your inquiry.

Sincerely,

Dr. Valerie Overgaard, Associate Superintendent
Learning Services

Appendix C ~ Information Letter for Students



Sport and Exercise Psychology Lab
School of Human Kinetics
Auditorium Annex A
1924 West Mall, Vancouver, BC, V6T 1Z2

Survey Study ~ Student Information Letter

Students' Attitudes toward Physical Education

Principal Investigator:
Mark R. Beauchamp, Ph.D.
School of Human Kinetics
University of British Columbia
Contact Number: 604-822 4864
mark.beauchamp@ubc.ca

Co-Investigator:
Sharon Keith, M.A. Candidate
School of Human Kinetics
University of British Columbia
Contact Number: 604-822-9156
sharkeit@interchange.ubc.ca

We are researchers from the University of British Columbia (UBC). We are interested in what you think about physical education. In three to four weeks time we will be coming to your school and we will invite you to complete a survey. This should take 15-20 minutes of your time and this will be done during school hours. The information you provide will help us understand what motivates students to participate in Physical Education.

We want to hear your opinion on these issues as your views are very important to us. This research has been approved by your school board as well as the University of British Columbia ethics committee. Please know that your involvement in this study is voluntary. It's up to you if you want to take part or not. If for ANY reason, you do not want to take part in this study that's fine, you don't have to. If you decide to take part, you will also be free to withdraw at any time without having to give any reason. If you drop out you will not experience ANY negative consequences at all.

As well as completing the initial survey in 3-4 weeks time, we will repeat this process 2 months later. So, in short, we are asking you to complete two surveys over the course of two months. If you decide to take part, your answers will be kept private, and will not be shared with ANYONE else. That means your responses will be combined with those of other students and so no-one will know how you will have answered the questions except you. All completed surveys will be kept in a locked cabinet at UBC. Your survey will not be made available to anyone other than the researchers involved in this study.

There are no known risks associated with participation in this study. If you have any questions about what is involved please contact Dr. Mark Beauchamp or Sharon Keith by email or phone. Their email addresses and phone numbers are at the top of this page. You can also contact the Office of Research Services at UBC. They have a 'Research Subject Information Line' and they can help answer any questions or concerns you might have. Their phone numbers is 604-822-8598.

We would also like you to take the parental information letter that's attached to this letter and give it to one of your parents or legal guardians. If your parents do not speak English, please let us know what language they do speak and we will give you a translated copy of this letter. Although this study does not involve any known risks we would encourage you to discuss your involvement with your parents/guardians. If for any reason they wish for you not to take part in this study they can let us know by phone or by email, or they can sign and return the attached letter.

We look forward to seeing you in a few weeks time.

Thank you for your help,

Mark Beauchamp, PhD

Sharon Keith, BHK

This research is funded by the Social Sciences and Humanities Research Council of Canada

Appendix D ~ Information Letter for Parents



Sport and Exercise Psychology Lab
School of Human Kinetics
Auditorium Annex A
1924 West Mall, Vancouver, BC, V6T 1Z2

Survey Study ~ Parent/Guardian Information Letter

Students' Attitudes toward Physical Education

Mark Beauchamp, PhD
(Principal Investigator)
School of Human Kinetics
University of British Columbia
Contact Number: 604-822 4864
mark.beauchamp@ubc.ca

Sharon Keith, BHK

School of Human Kinetics
University of British Columbia
Contact Number: 604-822-9156
sharkeit@interchange.ubc.ca

November 12, 2008

Dear Parent,

My name is Sharon Keith and I'm a researcher at the University of British Columbia. I am currently involved in a long-term program of research that is designed to better understand students' attitudes towards physical education. This research is funded by the Social Sciences and Humanities Research Council of Canada. In a few weeks time I will be going in to your child's school and will be inviting students to complete a survey. In this survey we will ask students a series of questions about their experiences and attitudes towards physical education. We will administer the same questionnaires again two months afterwards.

On both occasions it will take students approximately 15-20 minutes to complete the surveys. None of the questions that we ask are of a delicate or intrusive nature and there are no known risks associated with students' involvement in this study. Student participation is entirely voluntary, and even if students initially choose to take part in this study they may subsequently withdraw at any time without having to give any reason and without experiencing any negative consequences.

The answers your child provides will be combined with those of other students who are taking part in this research and any information students provide will remain completely confidential. All completed questionnaires will be kept in a locked cabinet at the University of British Columbia and shall not be made available to anyone other than the researchers involved in this study.

If you **DO NOT** wish for your child to take part in this research, all we ask you to do is complete this form and return it to your child's teacher. Alternatively, you can email or phone myself or Dr. Beauchamp using the contact details identified above and we will ensure that your son/daughter does not take part in this study. Also, even if you have consented for your child to take part in this study, we also require his/her own consent as well before s/he can be invited to take part. If you have any questions or want further information about the study please contact myself or Dr. Mark Beauchamp at (604) 822 4864. Alternatively, if you have any questions, comments, or concerns about this project, please contact the 'Research Subject Information Line' at the Office of Research Services, UBC, (604) 822-8598. They will be more than happy to answer any questions or concerns you might have.

SO, IF YOU **DO NOT** WANT YOUR CHILD TO TAKE PART PLEASE SIGN THIS FORM AND RETURN THIS TO YOUR CHILD'S TEACHER:

I.....
(Parent/Guardian Name)

DO NOT wish for my child to take part in this research.
(Child's Name)

Signed..... Date.....
(Parent/Guardian Name)

Yours sincerely,

Mark Beauchamp, PhD
(Principal Investigator)

Sharon Keith, BHK

This letter is also available in Chinese, Korean, Spanish, Polish, and Farsi.

Appendix E ~ Student Questionnaire Package



Sport and Exercise Psychology Lab
School of Human Kinetics
Auditorium Annex A
1924 West Mall, Vancouver, BC, V6T 1Z1

Survey ~ Student Version

Students' Attitudes toward Physical Education

Principal Investigator:
Mark R. Beauchamp, Ph.D.
School of Human Kinetics
University of British Columbia
Contact Number: 604-822 4864
mark.beauchamp@ubc.ca

Co-Investigator:
Sharon Keith, M.A. Student
School of Human Kinetics
University of British Columbia
Contact Number: 604-822-p156
sharkeit@interchange.ubc.ca

We are researchers from the University of British Columbia (UBC). We are interested in what you think about physical education. The information you provide will help us understand what motivates students to be physically active.

We want your opinion on these issues. There are no right or wrong answers. There are no good or bad answers. This is NOT a test. It will take about 15 minutes to complete this questionnaire package. You are asked to do this on your own. Your answers are very important to us so please make sure you complete all answers honestly.

If you have any questions please just ask the researcher. If for ANY reason, you do not want to take part in this study that's fine, you don't have to. It is up to you if you want to take part or not. You are also free to withdraw at any time without having to give any reason. If you drop out you will not experience ANY negative consequences at all.

DO NOT PUT YOUR NAME ON THIS SURVEY. Your answers will be kept confidential. Your responses will be combined with those of other students and so no-one will know how you answered the questions except you. All completed surveys will be kept in a locked cabinet at UBC. Your questionnaire will not be made available to anyone other than the researchers involved in this research.

There are no known risks associated with participation in this study. If you have any questions about what is involved please contact Dr. Mark Beauchamp or Sharon Keith by email or phone. Their email addresses and phone numbers are at the top of this page. You can also contact the Office of Research Services at UBC. They have a 'Research Subject Information Line' and they can help answer any questions or concerns you might have. Their phone numbers is 604-822-8598.

By completing this questionnaire you are agreeing to participate in this study. Please read the instructions carefully. Once you have finished, please check to see that all questions have been answered. When you have finished just return the questionnaire to the researcher.

Thank you for your help,

Mark Beauchamp, PhD

Sharon Keith, BHK

This research is funded by the Social Sciences and Humanities Research Council of Canada

Physical Education Questionnaire

PART A: Background Information

A1. Date of Birth: _____ (Day) _____ (Month) 19 _____ (Year)

A2. Place of Birth: _____ (City) _____ (Country)

A3. What is your age (years): _____

A4. Gender (check one): ☐ Male ☐ Female

A5. School Name: _____

A6a. Class Name (Division): _____ **A6b.** Grade: _____

A7. How do you describe yourself in terms of your ethnic origin?

PLEASE CHECK **ALL** THAT APPLY.

	✓		✓		✓
Canadian	<input type="checkbox"/>	East Indian	<input type="checkbox"/>	American (USA)	<input type="checkbox"/>
Native/Aboriginal	<input type="checkbox"/>	Dutch	<input type="checkbox"/>	Norwegian	<input type="checkbox"/>
Chinese	<input type="checkbox"/>	Persian	<input type="checkbox"/>	Italian	<input type="checkbox"/>
British	<input type="checkbox"/>	Polish	<input type="checkbox"/>	Korean	<input type="checkbox"/>
Irish	<input type="checkbox"/>	Hispanic	<input type="checkbox"/>	Filipino	<input type="checkbox"/>
German	<input type="checkbox"/>	Russian	<input type="checkbox"/>	Australian	<input type="checkbox"/>
French	<input type="checkbox"/>	Vietnamese	<input type="checkbox"/>	Japanese	<input type="checkbox"/>

Other _____

A8. What are the first three digits on your postal code (e.g., V6T.....): _____

A9. What is your mother/female guardian's job? _____

A10. What is your father/male guardian's job? _____

A11. What is today's date: _____ (Day) _____ (Month) 20 _____ (Year)

PART B

In this section, we would like you to describe the teaching style of your physical education teacher. To answer each question, please circle the number that best describes what you think. **If a question is irrelevant, or if you are unsure or do not know the answer, leave the answer blank.** Please be as honest as possible, and answer how frequently each statement fits the teacher you are describing.

Please think about your Teacher during Physical Education!

Use the following rating scale:

Not at all	Once in a while	Sometimes	Fairly often	Frequently
0	1	2	3	4

THE TEACHER I AM RATING ...

1. Shows that s/he cares about me	0	1	2	3	4
2. Acts as a person that I look up to	0	1	2	3	4
3. Creates lessons that really encourage me to think	0	1	2	3	4
4. Demonstrates that s/he believes in me	0	1	2	3	4
5. Treats me in ways that build my respect	0	1	2	3	4
6. Is enthusiastic about what I am capable of achieving	0	1	2	3	4
7. Provides me with tasks and challenges that get me to think in different ways	0	1	2	3	4
8. Motivates me to try my hardest	0	1	2	3	4
9. Tries to know every student in the class	0	1	2	3	4
10. Gets me to question my own and others' ideas	0	1	2	3	4
11. Tries to help students who might be struggling	0	1	2	3	4
12. Talks about his/her personal values	0	1	2	3	4
13. Encourages me to look at issues from different sides	0	1	2	3	4
14. Recognizes the needs and abilities of each student in the class	0	1	2	3	4
15. Is optimistic about what I can accomplish	0	1	2	3	4
16. Behaves as someone that I can trust	0	1	2	3	4

PART C

In this section, we are interested in **your views and attitudes** towards Physical Education. Again, please circle the number that best describes what you think.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I think I am pretty good at PE.	1	2	3	4	5	6	7
I am satisfied with my performance in PE.	1	2	3	4	5	6	7
When I have participated in PE for a while, I feel pretty competent.	1	2	3	4	5	6	7
I am pretty skilled at PE.	1	2	3	4	5	6	7
I can't do PE very well.	1	2	3	4	5	6	7

With the other students in my PE class I feel...

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Supported	1	2	3	4	5	6	7
Understood	1	2	3	4	5	6	7
Listened to	1	2	3	4	5	6	7
Valued	1	2	3	4	5	6	7
Safe	1	2	3	4	5	6	7

In PE class...

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I can decide which activities I want to practice.	1	2	3	4	5	6	7
I have a say regarding what skills I want to practice.	1	2	3	4	5	6	7
I feel that I do PE because I want to.	1	2	3	4	5	6	7
I feel a certain freedom of action.	1	2	3	4	5	6	7
I have some choice in what I want to do.	1	2	3	4	5	6	7

I take part in PE class.....

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
because PE is fun.	1	2	3	4	5	6	7
because I want to learn sport skills.	1	2	3	4	5	6	7
because I want the teacher to think I'm a good student.	1	2	3	4	5	6	7
because I'll get into trouble if I don't.	1	2	3	4	5	6	7
but I don't really know why.	1	2	3	4	5	6	7
because I enjoy learning new skills.	1	2	3	4	5	6	7
because it is important for me to do well in PE.	1	2	3	4	5	6	7
because I would feel bad about myself if I didn't.	1	2	3	4	5	6	7
because that's what I am supposed to do.	1	2	3	4	5	6	7
but I don't see why we should have PE.	1	2	3	4	5	6	7
because PE is exciting.	1	2	3	4	5	6	7
because I want to improve in sport.	1	2	3	4	5	6	7
because I want the other students to think I'm skilful.	1	2	3	4	5	6	7
so that the teacher won't yell at me.	1	2	3	4	5	6	7
but I really feel I'm wasting my time in PE.	1	2	3	4	5	6	7
because of the enjoyment that I feel while learning new skills/techniques.	1	2	3	4	5	6	7
because I can learn skills which I could use in other areas of my life.	1	2	3	4	5	6	7
because it bothers me when I don't.	1	2	3	4	5	6	7
because that's the rule.	1	2	3	4	5	6	7
but I can't see what I'm getting out of PE	1	2	3	4	5	6	7

PART D

Below, there are some statements about what **you think** about the Physical Education lessons you have been participating in. Please circle the number that best describes what you think.

1. Generally, doing Physical Education in school is...

1	2	3	4	5	6	7
Very boring			I'm not sure			Very Interesting

2. How much do you like the physical education lesson?

1	2	3	4	5	6	7
Not at all			I'm not sure			Very much

3. Would you like doing more hours of physical education in school if it was not at the expense of other lessons?

1	2	3	4	5	6	7
I am very sure I would not like it			I'm not sure			I am very sure I would like it

4. For me, being good in the physical education lesson is...

1	2	3	4	5	6	7
Not important At all			I'm not sure			Very important

5. Generally, how useful is what you learn in the physical education lesson?

1	2	3	4	5	6	7
Not useful at all			I'm not sure			Very useful

6. After finishing school, how useful do you think what you learn in the physical education lesson is going to be?

1	2	3	4	5	6	7
Not useful at all			I'm not sure			Very useful

PART E

Here are some questions about yourself as a student in Physical Education class. Please circle the number that best describes what you think.

	Not at all true			Not sure			Very true
I'm certain I can master the skills taught in PE class this year.	1	2	3	4	5	6	7
Even if the work is hard, I can learn it.	1	2	3	4	5	6	7
I can do almost all the work in PE class if I don't give up.	1	2	3	4	5	6	7
I'm certain I can figure out how to do the most difficult work.	1	2	3	4	5	6	7
I can do even the hardest work in my PE class if I try.	1	2	3	4	5	6	7

PART F

Below are some statements about how you participate in Physical Education class. Please circle the number that best describes what you think.

	Never	Seldom	Sometimes	Often	Almost Always
1. I follow classroom rules in PE	1	2	3	4	5
2. I am able to correct my behaviour when my teacher asks	1	2	3	4	5
3. I tell people when I am unhappy about something	1	2	3	4	5
4. I listen to suggestions from my teacher	1	2	3	4	5
5. I work well in large groups of students	1	2	3	4	5
6. I get along well with other adults in the classroom/gym	1	2	3	4	5
7. I listen to what others have to say	1	2	3	4	5
8. I get along with people who are different from me	1	2	3	4	5
9. I work effectively in small groups of students	1	2	3	4	5
10. I get along well with other students in my class	1	2	3	4	5
11. I ask questions about tests or activities in PE	1	2	3	4	5
12. I participate in class discussions	1	2	3	4	5
13. I volunteer an answer when I think I am right	1	2	3	4	5
14. I am a leader in my class	1	2	3	4	5
15. I volunteer to demonstrate in class	1	2	3	4	5
16. I start conversations with my classmates	1	2	3	4	5
17. I ask questions when I am confused	1	2	3	4	5
18. I share my ideas when my teacher calls on me	1	2	3	4	5