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Relationships between Perceived Motivational Climates, Perceived Autonomy Support, and Physical Self-Perceptions of University and College Students

by

Katie Elizabeth Frauts 

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Arts

Department of Physical Education and Recreation

Edmonton, Alberta

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **Relationships between Perceived Motivational Climates, Perceived Autonomy Support, and Physical Self-Perceptions of University and College Students** submitted by **Katie Elizabeth Frauts** in partial fulfillment of the requirements for the degree of **Master of Arts**.

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ABSTRACT

The purpose of this study was to examine the relationships between perceptions of the motivational climate, perceived autonomy support, and physical self-perceptions in students participating in introductory physical activity courses. Participants (N = 398, $\underline{M}$ = 21.26 years, 55% women) completed scales assessing demographics, perceived motivational climates (mastery, performance), perceived autonomy support, and physical self-perceptions (physical self-worth, body attractiveness, sport competence, conditioning, and strength).

Bivariate correlations revealed modest relationships between perceived autonomy support and the perceived mastery and performance variables, with smaller relationships being noted with physical self-perceptions. Multiple regression predicted 9% of the physical self-worth variance in women with autonomy support being the only significant ($\underline{p} < .05$) predictor. The regression model for men did not reach statistical significance.

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Chapter 1

Introduction

The constructs of self-esteem and self-perceptions have contributed to the explanation of human behavior and mental well being (Fox, 1990). Although some conceptual ambiguity is acknowledged (Fox, 2000), self-esteem is generally defined as the awareness of the good possessed by the self (Campbell, 1984), or the evaluation of how well one is doing in life (Fox, 2000). Self-perceptions, on the other hand, are more specific descriptions of self-attributes and characteristics that one acknowledges (Harter, 1999). They are perceptions of adequacy within different life domains, such as academic, social, physical, and emotional domains (Sonstroem, 1998). Harter's (1978, 1985) work reveals that even young children make distinctions in their self-perceptions across different domains, and that these perceptions become increasingly differentiated with age. Moreover, theorists propose that individuals' domain-specific self-perceptions contribute to their more global perceptions of self-esteem (Fox & Corbin, 1989; Harter, 1978, 1985; Shavelson, Hubner, & Stanton, 1976).

Self-esteem and self-perceptions have become increasingly recognized as important mediators of cognitions, behavior, and affect in the domains of education, physical education, health, and recreation (Fox & Corbin, 1989; Page, Ashford, Fox, & Biddle, 1993). For example, research has demonstrated that self-esteem is positively associated with academic performance, physical performance, and perceived satisfaction. It is also negatively related to anxiety (Fox, 1992). Self-perceptions have been linked to motivation, behavioral intentions, and competence (Bibik, 1999; Fox, 2000; Fox & Corbin, 1989; Hayes, Crocker, & Kowalski, 1999). Given the important role of these

constructs within all life domains, a great deal of research has been focused on investigating the factors that affect self-esteem and self-perceptions, their correlates and consequences, as well as the dimensionality and organization of these two constructs.

Over the years, the conceptual understanding and measurement of self-esteem have undergone significant changes. Originally, self-esteem was considered to be a unidimensional construct (Fox & Corbin, 1989; Harter, 1985). It was measured by asking individuals to respond to positive and negative self-statements that were summed to produce a composite self-esteem score, which was seen as quite global in nature. However, the research of Shavelson et al. (1976), Harter (1978), and others demonstrated that individuals evaluate themselves differentially across different domains of their lives. As a result, the multidimensionality of self-esteem was acknowledged and incorporated into models of the self. These models depict a hierarchical structure with global self-esteem at the apex, and dimensions such as academic, social, emotional, and physical self-perceptions below (Fox, 1992). The multidimensionality has also been incorporated into the *measurement* of self-esteem. New instruments still contain measures of global self-esteem, but also incorporate separate subscales to assess self-perceptions across various life domains (Fox & Corbin, 1989; Harter, 1985; Marsh Richards, Johnson, Rocher, & Tremayne, 1994).

Physical self-perceptions have consistently been identified as one of the salient component domains of multidimensional models of the self (Fox & Corbin, 1989; Harter, 1985; Marsh et al., 1994; Shavelson et al., 1976; Sonstroem, 1997; Sonstroem & Morgan, 1989). Physical self-perceptions have been described as pertaining to perceptions of physical competence, appearance, and aspects of physical fitness (Fox, 1997, 1998, 2000;

Fox & Corbin, 1989; Sonstroem & Potts, 1996). They also include more general perceptions of physical self-worth, defined as feelings of pride, satisfaction, happiness, and confidence in the physical self (Fox, 1997; Fox & Corbin, 1989).

To advance the study of the physical self, Fox and Corbin (1989) adopted the contemporary view of self-esteem as hierarchical and multidimensional. Their model (see Figure 1) places global self-esteem at the apex, physical self-worth at the level of a domain, and more specific physical self-perceptions at the subdomain level. Fox and Corbin (1989) advocated that positive perceptions of fitness (strength, conditioning), body attractiveness, and sport competence directly influence the more general perceptions of physical self-worth, which in turn (and along with other general self-perceptions of academic, social, emotional self-worth) directly influences global self-esteem. In other words, physical self-worth mediates the relationship between the physical self-perception subdomains and global self-esteem (Fox & Corbin, 1989; Hayes et al., 1999; Sonstroem, Harlow, & Josephs, 1994).

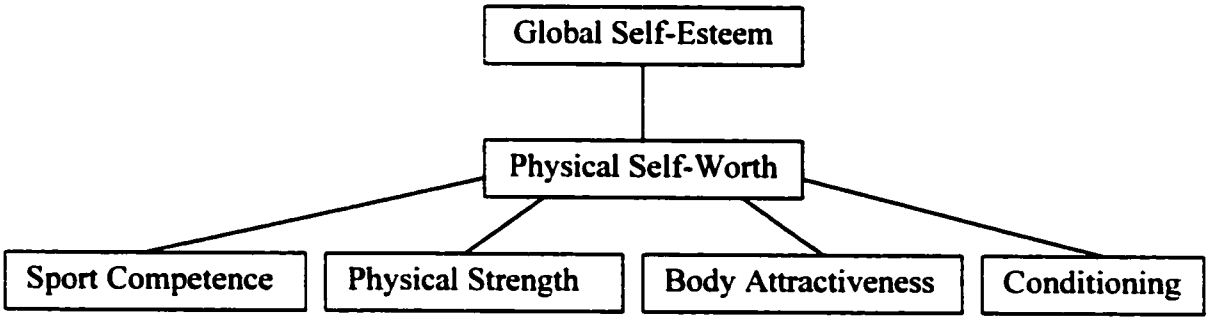

Figure 1. Hypothesized three-tier hierarchical organization of physical self-perceptions and self-esteem (Fox & Corbin, 1989).

Despite this hierarchical organization, however, all levels of the structure are important to health and well being. For example, a study by Sonstroem and Potts (1996) that examined the relationships between physical self-perceptions and life adjustment variables associated with mental health in university students revealed that physical self-perceptions and self-esteem accounted for unique portions of variance in mental health. The authors found that perceptions of physical self-worth, sport competence, body attractiveness, and conditioning were positively related to mental health, even when self-esteem was controlled for. This is consistent with other research that has indicated that physical self-perceptions at the domain and subdomain level, have manifested better associations with physical activity than global self-esteem (Marsh & Sonstroem, 1995; Sonstroem, Harlow, Gemma, & Osborne, 1991; Sonstroem et al., 1994). In general, Fox (2000) suggests that while global self-esteem is a relatively stable construct, physical self-perceptions are more susceptible to change. Sonstroem (1998) adds that meaningful changes are hard to detect when global self-esteem is employed in research, particularly in adults, because global self-esteem is the composite of many influences and resilient to change. Theoretically, self-perceptions at the subdomain level are most vulnerable to change, followed by the higher order "physical self-worth".

Research in sport (Sonstroem et al., 1994; Welk, Corbin, & Lewis, 1995), physical education (Asci, Asci, & Zorba, 1999; Bibik, 1999; Hayes et al., 1999), and physical activity (Crocker, Eklund, & Kowalski, 2000; Fox & Corbin, 1989) has demonstrated that physical self-perceptions are important predictors of behavior. They have been linked to exercise and physical activity intentions, and have played an essential role in people sustaining or discontinuing involvement in physical activity (Crocker et al.,

2000; Fox, 1992; Fox & Corbin, 1989; Kowalski, Crocker, & Kowalski, 2001; Marsh et al., 1994; Sonstroem, 1997; Sonstroem & Morgan, 1989; Welk et al., 1995). Fox (1992) contends that self-perceptions of physical abilities and physical appearance characteristics are established at an early age and remain salient throughout one's life. Positive experiences within physical activity during childhood and adolescence are believed to increase the likelihood of an adult partaking in a physically active lifestyle (Haywood, 1991). Presumably, this is due in part to the establishment of positive physical self-perceptions early in life.

Research has provided evidence that individuals' self-perceptions can be influenced by significant others, such as teachers, coaches, and parents (Ames, 1992a; Causgrove Dunn, 2000; Nicholls, 1989; Solmon, 1996; Sonstroem, 1998; Theeboom, DeKnop, & Weiss, 1995). For example, Bibik (1999) examined how college students develop their self-perceptions of competence in lifetime activity courses including badminton, tennis, and ballroom dance. She assessed how the students and teachers perceived the students' competence, how the students' perceived success, and the role of teachers' feedback and expectations on students' perceptions of competence. The findings indicated that teachers' expectations influenced students' perceptions of competence. It was suggested that teachers communicate their expectations to students through their feedback and behavior, which, in turn, influence students' own self-perceptions of competence.

Ames (1992a) suggests that the way teachers design tasks, group students for learning, and evaluate performance establishes a motivational climate that conveys certain goals to students. Similarly in sport, the way coaches design practices, group

athletes, give recognition, evaluate performance, and what they recognize and reward as desirable characteristics, establishes a motivational climate conveying certain goals to athletes. Ames (1992a) suggests that students and athletes perceive these situational goals and then adopt congruent goals of action. The perceived motivational climate, therefore, is the individual's interpretation of the situational goals structured by the teacher or coach. Two types of perceived motivational climates have been identified (Ames, 1992a; Nicholls, 1984). A perceived mastery motivational climate refers to an environment perceived to emphasize the goals of improvement, participation, effort, mastery, and cooperation. In contrast, a perceived performance climate is one that is interpreted as emphasizing interpersonal competition and superior normative ability (Newton & Duda, 1999).

Research has revealed that the individual experiences of students within different motivational climates are important, as research has linked different perceptions of the motivational climate with important motivational indices and affective characteristics (Ames, 1992a). Perceptions of mastery climates have been positively associated with global self-perceptions, and perceived academic and athletic competence in athletes and students from elementary to post secondary schools (Ames, 1992b; Ferrer-Caja & Weiss, 2000; Goudas, Biddle, Fox, & Underwood, 1995a; Goudas, Biddle, & Underwood, 1995b; Newton & Duda, 1999; Ntoumanis & Biddle, 1999a; Seifriz, Duda, & Chi, 1992;). In contrast, perceptions of a performance climate have been negatively associated with self-perceptions of athletic and academic competence (Ferrer-Caja & Weiss, 2000; Goudas et al., 1995a; Goudas et al., 1995b; Newton & Duda, 1999; Ntoumanis & Biddle, 1999a; Seifriz et al., 1992;). Given that research suggests a

favorable link between perceived mastery climates and self-perceptions, Ames (1992a) advocates the promotion of mastery climates in instructional settings by coaches, teachers, and parents.

Although previous research has examined physical self-perceptions in a number of contexts, there is little known about how perceived motivational climates in physical education relate to multidimensional physical self-perceptions. Given the research evidence of relationships between perceived motivational climates and perceived athletic competence, one may anticipate similar relationships between physical self-perceptions and perceived motivational climates. In other words, physical self-perceptions may be positively related to perceived mastery climates and negatively related to perceived performance climates.

In addition to the motivational climate, another aspect of the instructional or coaching environment that is perceived by participants and may be important to their self-perceptions is autonomy support. Self-determination theorists believe that perceptions of autonomy support provided by important others (e.g., teachers, coaches) in the environment may impact individuals' perceptions of self-esteem by enabling students and athletes feelings of volition and decision making authority (Ryan & Deci, 2000; Ryan & Grolnick, 1986). Autonomy supportive teachers or coaches provide individuals with opportunities for self-direction, and are empathetic in acknowledging participants' feelings (Ryan & Deci, 2000).

It should be noted that although there has been a considerable amount of research into the role of perceived autonomy in physical activity, there has been little research examining perceived autonomy support. Perceived autonomy (i.e., feelings of volition

and self-initiative, which may or may not be a function of external others) is positively related to perceived autonomy support, but the two are separate constructs. Current evidence suggests that perceived autonomy is related to perceived competence (Goudas, Biddle, & Fox, 1994; Goudas et al., 1995a; Goudas et al., 1995b) in physical education, and that it is a potential mechanism in the development of physical self-worth and self-esteem (Fox, 2000). Given the positive relationship between perceived autonomy and perceived autonomy support, one might predict a similar role for perceived autonomy support. Fox (1997) suggests that both perceived autonomy and perceived autonomy support might have a place in the hierarchical structure of self-esteem and physical self-perceptions (Figure 1). However, this has yet to be demonstrated empirically.

The relationships between perceived autonomy and the perceived motivational climates have received little attention in the research thus far. The one study that examined perceptions of the motivational climate and perceptions of autonomy together, was done by Kowal and Fortier (2000). They reported that in masters level swimmers ranging in age from 18-64 years, perceptions of a performance climate were negatively related to perceptions of autonomy. No significant relationship emerged between perceptions of a mastery climate and perceptions of autonomy. As a result of these findings, one may expect that perceptions of autonomy support are also negatively correlated with perceptions of a performance climate. Based on previous research that has found associations between perceptions of mastery climates and perceived competence (Causgrove Dunn, 2000; Ferrer-Caja & Weiss, 2000), and intrinsic motivation (Kavussanu & Roberts, 1996; Newton & Duda, 1999) one would anticipate

that a mastery climate would be positively correlated with perceptions of autonomy support.

The purpose of this study was to determine the relationships between perceptions of the motivational climate, perceptions of autonomy support, and physical self-perceptions in a sample of male and female university and college students in physical education classes. This study provides indications of the role of the perceived motivational climates and perceived autonomy support on multidimensional perceptions of the physical self. To date, the research involving perceptions of autonomy support has focused predominantly on the classroom domain. It is hoped that investigation of the relationships among the constructs in this study will allow physical activity instructors at the post secondary level to promote climates that advocate higher physical self-perceptions.

Delimitations

1. This study examined the physical self-perceptions, perceptions of the motivational climate, and perceptions of autonomy support of university and college students within physical education classes at two Canadian post secondary institutions. The participants were male and female students at the University of Alberta and Grant Mac Ewan Community College enrolled in Level One physical activity classes during the fall term of the 2000-2001 academic year. The age of the participants ranged from 17-40 years (M = 21.26, SD = 2.97).

2. All data were based on self-report measures that are equally limited to the extent that participants chose to reveal this personal information. Students' perceptions on relevant variables were assessed through their responses to questionnaire items.

Limitations

1. The generalizability of the findings of this study are limited to predominantly white, middle class, educated students at the university or college level within Canadian society. The applicability of the findings are further limited because the majority of the participants were from three programs of study; (1) Bachelor of Physical Education (BPE) (44.4%), (2) Bachelor of Education (BED) (21.2%), and (3) BPE/BED (18.4%). Although the physical education classes are open to all students, the students from these three programs comprised 329 of the 398 student participants, and 3 of the 25 programs represented in the sample (see Appendix A).

2. Another potential limitation is that although participants chose to enroll in these physical education classes, this may have been based in part on their levels of competence. Having noted this, it is unlikely that all students in a Bachelor's program in Physical Education or Education are physically competent in all physical activities. Moreover, in order to receive a Bachelor's degree in Physical Education or Education (with a Physical Education major or minor), students are required to take a number of physical activity classes. Therefore, the sample was likely to include at least some participants who were beginners in the activities they selected, and had lower levels of perceived and actual competence. In fact, about 41% of participants indicated that they were beginners in the activity in which they had enrolled and 41.6% reported no prior experience in the activity.

3. Another potential limitation of this study was the use of the Learning Climate Questionnaire (LCQ) to assess perceptions of autonomy support. This study appears to be the first to use the LCQ within a physical activity domain in university and college

contexts. The LCQ has been frequently used in the health care setting, as an indicator of perceived autonomy support from a salient health care provider (Williams, Grow, Freedman, Ryan, & Deci, 1996), although it is gaining support within the educational field (Black & Deci, 2000; Vallerand, Fortier, & Guay, 1997; Williams et al., 1996).

Chapter 2

Review of Literature

The perception of the physical self is strongly influenced by perceptions in several subdomains of physical accomplishment and appearance (Fox, 1992). The physical self is revealed through physical self-perceptions that are instrumental components of identity and self-esteem (Fox, 1998). Physical self-perceptions have been positively related to physical activity involvement, sport participation, and exercise, in children, adolescents, young adults, and older adults (Crocker et al., 2000; Fox & Corbin, 1989; Sonstroem, Speliotis, & Fava, 1992; Sonstroem et al., 1994; Welk et al., 1995). Physical activity involvement, in turn, has been associated with improved self-esteem, psychological well being, and the enhancement of moral and social development (Cavill, Biddle, & Sallis, 2001). "What is important for physical educators is that self-perceptions concerned with physical abilities and physical-appearance attributes appear to be consistently represented from a very early age and remain present in some form throughout the life span" (Fox, 1992, p.42). Therefore, positive experiences in physical education or activity are necessary for positive self-perception enhancement. Physical educators may play a role in the mediation of self-esteem and the promotion of behaviors toward achievement (Fox, 1992).

Physical Self-Perceptions

Physical self-perceptions refer to personal evaluations of the self and behavior within the physical environment (Sonstroem, 1998). Social comparisons, achievement, and performance within the physical domain influence these perceptions. Physical self-perceptions are better described within the broader context of self-esteem research. As

previously discussed, self-esteem was originally viewed as a unidimensional construct; there were no attempts to measure self-perceptions in different life domains. As a result, important information about the behavior in different contexts was lost, because dimensions of the self (e.g., physical self, cognitive self, social self) were not seen as distinct from either general self-esteem, or each other (Fox, 1998). Several researchers recognized the limitations of this unidimensional approach to self-esteem, and a multidimensional approach was adopted (Shavelson et al., 1976; Fox & Corbin, 1989; Harter, 1985).

In 1982, Harter developed the Perceived Competence Scale for children in Grades 3 to 8. This scale utilized a multidimensional profile approach to self-esteem through the assessment of general self-worth and perceptions of competence in several different life domains (physical, cognitive, and social). The Perceived Competence Scale was extended by Harter in 1985, and became known as the Self-Perception Profile for Children. This new scale included five dimensions of perceived competence and adequacy, including physical, cognitive, social, physical appearance, and behavioral conduct dimensions (Fox, 1998; Fox & Corbin, 1989; Sonstroem, 1998). Harter also developed measures of self-perceptions for adolescents, college students, and adults, and demonstrated that perceptions of competence become increasingly differentiated with age (Fox, 1998). In general, these self-perception profiles allow for documentation of patterns of differences among individuals and populations that are more sensitive to change than the previously employed unidimensional profiles (Fox, 1998).

In an attempt to apply the same notion of multidimensionality to physical self-concept, Fox & Corbin (1989) initiated a series of studies of physical self-perceptions.

The main purpose of this research was to design and validate a multidimensional physical self-perception profile based on the methodology of Harter (Fox & Corbin, 1989). Several pilot studies were conducted with a large sample (N>1000) of college students, to investigate the nature and structure of physical self-perceptions. Data gathered through open ended questions were factor analyzed, leading to the development of the 30 items comprising the Physical Self-Perception Profile (PSPP) (Fox & Corbin, 1989).

Figure 1 shows the hypothesized structure underlying individuals' physical self-perceptions. The figure illustrates that global physical self-worth is a component domain of general self-esteem (as are other domains of self-perceptions, such as academic self-worth, social self-worth, and emotional self-worth). Global physical self-worth, in turn, is underpinned by four subdomains. The four subdomains identified by Fox and Corbin (1989) include sport competence, physical conditioning, strength, and body attractiveness.

According to Sonstroem (1998) and Fox (2000), self-perceptions are more vulnerable to change at the more specific bottom (or subdomain) level and most resilient to change at the more global level. This is not to imply, however, that changes in self-perceptions necessarily follow a sequence from subdomain to global levels. If so, then relationships between the both domain and subdomain self-perceptions and the correlates of self-esteem would be low to zero in the presence of self-esteem. Sonstroem and Potts (1996) demonstrated that this was not the case for mental adjustment variables (negative and positive affect, depression, and health complaints) in male and female university students. The results from hierarchical regression analyses demonstrated that the five PSPP subscales significantly improved the prediction of the positive affect in women,

and positive affect and health complaints in men, over and above the prediction provided by global self-esteem and social desirability. This indicates that the two tiers of physical self-perceptions had their own unique relationship with the mental adjustment variables, independent of their relationship with self-esteem, and the influence of general self-esteem on mental adjustment.

Physical Self-Perceptions and Physical Activity Involvement. Several studies have examined the relationship between physical self-perceptions and physical activity participation, most commonly in the context of exercise (Crocker et al., 2000; Daley & Parfitt, 1996; Fox & Corbin, 1989; Kowalski et al., 2001). For example, Fox and Corbin's (1989) original study found that scores on the PSPP for all subscales except body attractiveness in women, were positively related to self-reported physical activity participation in university students in the United States. The Self Report of Physical Activity questionnaire was used to determine both the degree (frequency, intensity, and duration) and type of involvement in activities categorized as ball sports, aerobic endurance, weight training, calisthenics, or other activities (Fox & Corbin, 1989). In a later study of Canadian college students, Hayes et al. (1999) examined sex differences on the PSPP, and the relationship between the PSPP and physical activity levels. All of the PSPP subscales were positively related to participation in physical activity in males, but only conditioning was related to participation in physical activity in females. This is interesting considering that the activity levels reported by males and females were similar.

Similar to the females in the Hayes et al. (1999) study, Kowalski et al. (2001) found that perceived conditioning competence was a significant predictor of self-reported

recent and typical physical activity participation in female university students in Canada. Recent physical activity was assessed by the self-administered 7-Day Physical Activity Recall questionnaire that estimates recent physical activity by assessing the level of occupational, leisure and home activities and the intensity of these activities over a one-week period. Typical activity was examined using the Leisure Time Exercise Questionnaire, which assesses the frequency of mild, moderate, and strenuous activities and participation in regular activity that lasts long enough to "work up a sweat". The results revealed that female students with higher physical condition self-perceptions had higher estimates of recent activity participation, and more frequent long term involvement in leisure time activities than those with low physical condition self-perceptions. The importance of self-perceptions of physical conditioning to participation in physical activity was also confirmed by Sonstroem et al. (1994), who reported that the physical conditioning competence subscale was a significant predictor of participation in aerobic dance and exercise activities by female aerobic dancers (M age = 38.4 years, SD = 16.2).

Although the importance of physical condition self-perceptions for females is well supported in the literature, there is also evidence that adult males are influenced by their self-perceptions of conditioning competence. In a sample of male and female adults ranging in age from 31-66 years of age, Sonstroem et al. (1992) found that the conditioning subscale was the strongest predictor of exercise behaviors with structure coefficients of .892 for females and .885 for males. They also reported that overall the PSPP was a good discriminator between exercisers and non-exercisers.

Even research on younger participants has found that perceptions of conditioning are an integral component of physical activity participation (Crocker et al., 2000). Crocker et al. (2000) studied the relationships between physical self-perceptions and physical activity participation in males and females aged 10-14 years. Students completed the Physical Activity Questionnaire for Older Children, which measures intensity (general, moderate to vigorous) and frequency of physical activity over the previous seven days. They found that males were more physically active, and recorded higher mean scores on all PSPP subscales than females. The low participation rate of females in physical activity is a concern because involvement in physical activity in childhood and adolescence may decrease the risk of adult health problems (Sallis et al., 1992). All of the four subdomains of the PSPP were positively correlated with physical activity, but the most important predictors of physical activity for both males and females in this sample were conditioning and sport competence.

Although most of the research indicates a link between at least some of the PSPP subscales and physical activity or exercise involvement, not all studies have reported this relationship. Daley and Parfitt (1996) examined physical self-perceptions and physical activity involvement in older males and females at a corporate health club. The results revealed that males with higher physical self-worth subscale scores were more involved in physical activity than males with lower physical self-worth subscale scores. In contrast, there was no significant relationship between physical activity involvement and the PSPP subscales in females. This suggests that the relationships between physical self-perceptions and physical activity involvement may be mediated by age and gender, however, further studies with older adults are required to validate this influence.

Physical Self-Perceptions and Sport Involvement. Sport participation has been linked to physical self-perceptions in that athletes are hypothesized to have higher physical self-perceptions than non-athletes (Welk et al. 1995). Hilton and Nielsen (2000) examined the relationship between sport and physical activity involvement and the physical self-perceptions of young women in three groups (varsity athletes, physical education students, general program students) at a Canadian university. They found that the average physical self-perceptions of varsity athletes were significantly higher than those of the general program students on all subscales, and significantly higher than the physical education students on global physical self-worth and sport competence. On average, the physical education students had higher self-perceptions than general students on all subscales except body attractiveness. For all three groups, body attractiveness had the lowest average ratings in comparison to the other subscales. Athletes rated sport competence the highest of the four subscales, while the physical education students rated conditioning the highest. Hilton and Nielsen (2000) suggested that athletes tend to have higher physical self-perceptions than active people on sport competence and that active people should have higher self-perceptions of physical condition and strength than less active people.

Welk et al. (1995) examined the physical self-perceptions of younger athletes. They administered the Children's Physical Self-Perception Profile (C-PSPP) to 760 high school athletes and compared the results to those found in previous studies with non-athletes. The C-PSPP includes modified versions of three PSPP subscales (conditioning, body attractiveness, and strength), and a sport/athletic competence subscale. The latter subscale is actually the perceived athletic competence scale from Harter's (1982)

Perceived Competence Scale for Children, which has been well validated for use with children. Welk et al. (1995) found that male and female athletes had higher physical self-perceptions (higher mean subscale scores) than those of other populations studied previously, including grade seven and eight students (Whitehead, 1995) and young adults (Fox & Corbin, 1989). Once again, males scored higher than females on all PSPP subscales. The subdomains with the highest mean scores were sport competence and conditioning for both males and females. Despite the research demonstrating positive relationships between perceived competence and sport, it is not known whether athletes choose sport involvement because of their perceived physical competence and other positive physical self-perceptions or if they develop positive feelings of competence and physical self-worth as a result of sport involvement.

Overall, the literature clearly demonstrates that physical self-perceptions are important correlates of physical activity participation, exercise involvement, and sport participation, for children, youth, and older adults (Fox & Corbin, 1989; Hayes et al., 1999; Sonstroem et al., 1992; Sonstroem et al., 1994; Welk et al., 1995). Moreover, females tend to have lower physical self-perceptions, and lower levels of physical activity involvement compared to males (Crocker et al., 2000; Fox & Corbin, 1989; Sonstroem et al., 1992; Welk et al., 1995). Although numerous studies have examined physical self-perceptions and physical activity involvement in a diverse array of groups (school-aged children, high school athletes, university and college students, adult aerobic and fitness participants), there has been little research into how the contexts of physical activity environments affect physical self-perceptions. The influences, if any, of the aerobics or

exercise instructors, physical education teachers, or athletic coaches, on physical self-perceptions are not well understood.

The Motivational Climate

Research evidence indicates that teachers and coaches influence the self-perceptions of students and athletes through the motivational climate in physical activity and sport settings (Ames, 1992a; Bibik, 1999; Ferrer-Caja & Weiss, 2000; Goudas et al., 1995a, Goudas et al., 1995b; Newton & Duda, 1999; Ntoumanis & Biddle, 1999a; Seifriz et al., 1992). Motivational climates are situational goal structures established by teachers and coaches, through their promotion of goals, cues, rewards and expectations (Ames, 1992a).

Teachers create motivational climates through the selection and design of tasks, the content and delivery of instructions, and through evaluation and rewards provided to students (Ames, 1992a). The reaction by a teacher to a student's failure or difficulty, the level of encouragement provided, and responses to effort and persistence, are all important indicators of the motivational climate. Similarly, coaches construct motivational climates in the ways they design practice sessions, group athletes, and evaluate performance. They also communicate certain goals through what they choose to reward, and how they provide recognition to athletes (Ames, 1992a).

Studies examining motivational climates were originally conducted in classroom settings. Through this research, two types of motivational climates were identified: mastery motivational climates and performance motivational climates (Ames & Archer, 1988). A mastery motivational climate is one that emphasizes learning, encourages effort and personal challenge, and fosters enjoyment (Ames, 1992a). Through the reinforcement

of individuals for improvements in skill or knowledge, hard work, cooperation with others, and successes that are due to effort, teachers and coaches promote a mastery climate (Newton & Duda, 1999). In contrast, a performance motivational climate is one that emphasizes social comparison, outperforming others, and surpassing normative standards (Ames, 1992a). Teachers and coaches can promote a performance climate by criticizing individuals for mistakes, encouraging intra-team rivalry, and providing recognition to only the individuals with the highest ability (Newton & Duda, 1999; Seifriz et al., 1992).

Despite the descriptions above, Ames (1992a) warns that a general motivational climate does not exist in any situation. In other words, not every individual will necessarily perceive motivational climate created by the teacher or coach. The cues, rewards, expectations, and feedback from teachers or coaches are not necessarily the same for all people in a particular situation (Papaioannou, 1995). Furthermore, individuals may interpret cues differently (Ames & Archer, 1988). Regardless of how the motivational climate is constructed, it cannot be assumed that everyone in the environment will perceive it as intended. Given that the perception of the motivational climate is what drives subsequent cognitions, affect, and behavior, this is an important distinction (Nicholls, 1989).

A great deal of attention has been directed at identifying correlates of perceived mastery and performance motivational climates in physical activity. As suggested by Ames (1992a), it appears that individuals' motivations and behaviors are responsive to their perceptions of the motivational climate in this domain as well as the classroom. Several studies have demonstrated that perceived mastery climates are positively related

to perceived competence (Ames, 1992b; Causgrove Dunn, 2000; Cury et al., 1996; Ferrer-Caja & Weiss, 2000; Goudas & Biddle, 1994; Goudas et al., 1995a, Goudas et al., 1995b; Kavussanu & Roberts, 1996; Newton & Duda, 1999; Ntoumanis & Biddle 1999a), intrinsic motivation (Duda, Chi, Newton, Walling, & Catley, 1995; Ferrer-Caja & Weiss, 2000; Goudas, 1998; Goudas & Biddle, 1994; Goudas et al., 1995a; Goudas et al., 1995b; Newton & Duda, 1999), enjoyment (Seifriz et al., 1992; Theeboom et al., 1995), satisfaction (Walling, Duda, & Chi, 1993), and beliefs that success is a function of effort (Kavussanu & Roberts, 1996; Seifriz et al., 1992). In comparison, perceived performance climates are negatively related to perceived competence (Causgrove Dunn, 2000; Newton & Duda, 1999; Ntoumanis & Biddle, 1999a) and positively linked to pressure (Newton & Duda, 1999), tension (Seifriz et al., 1992), worry (Walling et al., 1993), anxiety (Papaioannou & Kouli, 2000), and beliefs that success is dependent upon ability (Kavussanu & Roberts, 1996; Seifriz et al., 1992).

As a result of the benefits associated with perceptions of mastery climates, researchers have advocated the development of mastery climates within physical activity and sport. In an effort to promote mastery climates in classroom environments, Ames (1992a) developed guidelines for teachers that are intended to impact children's motivation over the long term. Ames outlined the structures and processes within classrooms that are likely to promote a mastery climate, and described the associated characteristics that affect how students engage in learning. She assessed the characteristics that underlie a mastery climate, and then created strategies to promote them (Ames, 1992a). Much of Ames' work is modeled after Joyce Epstein's (1989) approach to structuring six areas of the learning environment, referred to by the acronym

TARGET. The components of TARGET are: Task, Authority, Recognition, Grouping, Evaluation, and Time (Ames, 1992a). Task refers to the selection and design of class activities . To promote a mastery climate, Ames recommends that teachers select activities for variety, individual challenge, and active involvement. Authority refers to student participation within the classroom process. To create a mastery climate, teachers need to make students a part of decision-making, and enable students to develop self-management and self-monitoring skills. Recognition is described as the distribution of rewards and opportunities for rewards. In order to encourage a mastery climate, teachers need to acknowledge individual progress and improvement, and provide equal opportunities for rewards. Grouping refers to interactions among students, and the frequency of students working together. In the establishment of a mastery climate, teachers need to allow for different, flexible, group interactions between students. Evaluation is described as the standard associated with performance and evaluative feedback. To support a mastery climate, teachers need to involve students in self-evaluation, make evaluation private and meaningful, and recognize students' individual progress. Lastly, Time refers to the pace of learning, flexibility in scheduling, and the management of classwork. In creating mastery climates, teachers need to provide students with opportunities and time for improvement, as well as schedules for work and practice (Ames, 1992a).

Ames investigated the effect of the TARGET strategies on students' behaviors and attitudes in the classroom. She found that students in classrooms with teachers who used the TARGET strategies had higher intrinsic motivation, used more learning strategies, and had more positive attitudes towards learning than students with teachers

who did not implement the TARGET strategies (Ames, 1992a). Ames contends that the principles involved in promoting mastery climates in elementary schools can be applied to other domains, such as sport, exercise settings, or anywhere individuals are engaged in learning, skill development and evaluations of performance.

Perceptions of the Motivational Climate and Self-Perceptions in Physical Activity. As was previously mentioned, perceptions of the motivational climate have been associated with self-perceptions in physical activity (e.g., perceived competence). Why is this the case? What mechanism or process enables individuals' perceptions of situational goal structures to impact their self-perceptions within that environment? Achievement goal theorists (Ames, 1992a; Nicholls, 1989) predict that when emphasis is placed on mastery climate characteristics, individuals tend to perceive and adopt congruent goals of action (i.e., mastery, effort, and cooperation). As a result, evaluations of success or failure are based on subjective, self-referenced criteria (e.g., Did I learn something? Did I try hard? Am I getting better?). The outcome of this evaluation is likely to result in perceptions of success and positive perceptions of competence, even in individuals who recognize that they are not as skilled as others (Nicholls, 1989). In contrast, an emphasis on performance climate characteristics is predicted to cause individuals to focus on normative comparisons, and to evaluate a performance as successful only when it is superior to others'. As a result, a perceived performance climate is likely to produce perceptions of competence in only the few individuals who are among "the best".

It should also be noted that although the perceived motivational climate influences the types of goals an individual adopts in a particular situation, this is not the

only influence. According to achievement goal theory (Nicholls, 1989), individuals also have dispositional tendencies, or orientations, towards certain goals. A dispositional tendency toward mastery-type goals (e.g., effort, improvement, and mastery) is referred to as a task orientation. A dispositional tendency toward performance-type goals (e.g., out performing others, being the best) is referred to as an ego orientation. Both the perceived motivational climate and the goal orientations exert independent influences on the individual, resulting in a person by situation interaction. This interaction is further complicated by the finding of positive correlations between task orientation and a perceived mastery climate and between ego orientation and a perceived performance climate. It appears that one's goal orientation influences one's perceptions of the motivational climate such that individuals tend to perceive situational goal structures that are consistent with their dispositional goals (Causgrove Dunn, 2000; Kavussanu & Roberts, 1996; Lloyd & Fox, 1992; Nicholls, 1989).

One of the first studies to compare mastery and performance motivational climates on motivational processes was conducted by Ames and Archer (1988) in a secondary school classroom setting. They investigated students' perceptions of the classroom motivational climate, use of effective learning strategies, task choices, attitudes, and causal attributions. Students in Grades 8 to 11 who perceived an emphasis on mastery goals in the classroom were more likely to report the use of effective learning strategies, a preference for challenging tasks, a better attitude toward class (i.e., they liked it more), and attributions for success to effort. Students who perceived an emphasis on performance goals in the classroom tended evaluate their ability negatively and attribute failure to lack of ability. Ames and Archer (1988) suggested that the goals made salient

in the classroom may facilitate the adoption of congruent goals by students, although the generalizability of the findings were limited by the fact that students who participated had all achieved a minimum of 80% on the Secondary School Admissions Test in order to attend their school. Subsequent studies have included more heterogeneous samples with wider ranges of ability (Carpenter & Morgan, 1999; Ferrer-Caja & Weiss, 2000; Solmon, 1996). Taken together, these studies support the advocacy of mastery climates for all students, regardless of academic proficiency.

A few studies have been conducted in the physical activity domain to examine the effects of the motivational climate on self-perceptions, measured primarily in the form of Harter's (1982, 1985) perceived physical/athletic competence. Theeboom et al. (1995) compared the effects of a 3-week sports program that emphasized a mastery climate (developed through the use of the TARGET strategies) to one that had a "traditional climate" (in which the instructor represented authority, and performance goals were emphasized) in children aged 8 to 12 years. They found that children in the mastery program demonstrated superior skill performance and expressed more enjoyment than those in the traditional (i.e., performance) program. Although they did not find any significant differences between the groups in perceived competence, data gathered during interview sessions suggested that children in the mastery program had higher levels of perceived competence than children in the performance program. The authors suggested that non-significant statistical tests were due to an inadequate intervention period. However, another possible explanation for the lack of significant findings is that the children did not perceive the climates as intended, and therefore the interventions did not produce the predicted changes (Causgrove Dunn, 1997). It is not possible to determine if

this was the case though because children's' perceptions of the motivational climates were not assessed.

In a study by Solmon (1996), students' perceptions of the motivational climate and practice behaviors were examined in physical education classes that had been manipulated to emphasize either a mastery or performance climate. During the classes students in Grades 7 and 8 were taught a juggling task. Through manipulation checks, Solmon (1996) found that students accurately perceived the motivational climate structured by teachers to be either mastery or performance oriented. She also reported that students' persistence on the juggling task differed according to the motivational climate. Those who were in the mastery climate completed a greater number of practice trials at a difficult level, indicating persistence on a challenging task. In contrast, students in the performance climate completed fewer trials at challenging levels. These findings suggest that students may use effort reduction in certain physical activity environments in order to avoid embarrassment and maintain feelings of competence (Solmon, 1996). Solmon's (1996) study is consistent with others (Duda & Nicholls, 1992; Walling & Duda, 1995) that found performance motivational climates tend to foster beliefs that success is a result of ability.

Treasure (1997) conducted a study in a physical education setting with 10-12 year old males and females. He found that those students who perceived a high mastery/moderate performance climate in physical education had higher self-perceptions of ability, and were more inclined to believe that success was a result of effort than students who perceived a high performance/low mastery climate. Students, who

perceived a high performance/low mastery climate focused on ability as a cause of success, reported a negative attitude toward the class, and feelings of boredom.

In a more recent study, Ferrer-Caja and Weiss (2000) investigated the relationships among perceptions of the motivational climate in physical education, teaching style, perceived competence, self-determination, goal orientations, and intrinsic motivation. Participants were 407 high school students aged 14 to 19 years. They found that students who perceived a mastery climate reported higher scores on task orientation, perceived competence and self-determination, which were all related to increased intrinsic motivation, effort, and persistence. Students who perceived a performance climate reported higher levels of ego orientation, which was negatively related to intrinsic motivation. Ferrer-Caja and Weiss (2000) suggested that perceptions of a mastery climate influenced the information sources students used to evaluate their competence such that they focused on self-referenced information, such as effort and improvement.

Perceived competence has also been investigated in relation to perceptions of the motivational climate in physical education by young children (Grades 4 to 6) with movement difficulties (Causgrove Dunn, 2000). Causgrove Dunn (2000) looked at the relationships between perceived competence, perceptions of the motivational climate, and goal orientations. She found that overall, the dispositional tendency to adopt mastery-type goals (task orientation) was positively related to perceptions of a mastery climate, which was positively related to perceived competence in children with movement difficulties. In constrast, the dispositional tendency to adopt performance-type goals (ego orientation) was positively related to perceptions of a performance climate, which was negatively related to perceived competence. These findings support Nicholl's (1989)

hypothesis that even children who lack ability compared to others can perceive themselves as competent in a perceived mastery climate.

An important part of the creation of perceived mastery motivational climate is the evaluation of students. Treasure & Roberts (1995) compared perceptions of ability of students in Grades 6 and 7, in soccer class climates that emphasized either social comparison or cooperation. They found that perceived ability increased when decision making was shared between the teacher and student. Those children within cooperative climates focused more on their effort and were more motivated by challenges and hard work (Treasure & Roberts, 1995). In contrast, when competition was apparent, children tended to focus on normative ability and public evaluation (Treasure & Roberts, 1995). Similarly, Vallerand, Gauvin, and Halliwell (1986) examined the negative effects of competition on children's intrinsic motivation. They found that children in competitive-inducing contexts had decreased self-determination and intrinsic motivation compared to those in mastery-inducing contexts, and were apt to spend less time practicing the task because of perceived lack of competence.

Finally, a study by Bibik (1999) in the physical domain confirms the relationship between the perceived motivational climate and physical self-perceptions in college students. Bibik (1999) demonstrated that feedback provided by teachers in college physical education courses was related to students' perceptions of competence. Those students who perceived their competence as low recognized that teachers needed to provide them with a great deal of feedback, in comparison to others. In contrast, the students who perceived their competence as high felt that the teacher did not provide them with enough feedback, which they believed was a result of their high levels of

competence. Moreover, differential treatment by teachers was observed such that the low competence group (low by their own assessments) received more assistance through manual manipulation (e.g. teacher moves students' body into appropriate position) than other students. These findings suggest that teachers may influence students' self-perceptions of competence through the amount of corrective feedback and assistance provided. Although she did not measure the two perceived climates directly, Bibik's results nonetheless support the presence of an influential relationship.

Most of the literature examining the relationships between the perceived motivational climates and self-perceptions have used Harter's (1982, 1985) perceived physical or athletic competence scales, or single item indicators to measure perceived physical competence. Although these indicators are based on the assumption that individuals' competence perceptions are multidimensional (e.g., physical, academic, social), they are essentially unidimensional assessments of physical self-perceptions. In other words, these indicators assume that individuals have general (i.e., unidimensional) self-perceptions of competence or adequacy in the physical domain. There have not been any studies to date that have attempted to assess the relationships between perceived motivational climates and multidimensional physical self-perceptions. The investigation of these relationships is important because it may reveal more or different information than research based on unidimensional measures of physical competence. Researchers (Fox, 2000; Sonstroem, 1998) have suggested that the lower level (subdomain) of the hierarchical structure of physical self-perceptions is the most susceptible to change, while higher levels are more resilient. Therefore, the investigation of the relationships among the motivational climates and multidimensional physical self-perceptions may provide a

greater understanding of those relationships than the more global measures used previously.

Autonomy Support

Another theoretical approach that enables consideration of the influential role of situational cues on individuals' self-perceptions is self-determination theory. Self-determination theory posits that autonomy, competence and relatedness are three psychological needs that must be satisfied for healthy development (Deci & Ryan, 2000). Competence is defined as the ability to perform challenging tasks effectively and efficaciously (Deci, Vallerand, Pelletier, & Ryan, 1991). Relatedness is conceptualized as the existence of secure and satisfying connections with others in one's social context (Ryan & Deci, 2000). Autonomy is defined as being self-initiating and agentic in the regulation of one's own actions and behaviors (Deci & Ryan, 1985; Ryan & Deci, 2000). Deci et al. (1991) also defines autonomy as being self-initiating and self-controlling of one's actions. Of the three psychological needs that encompass self-determination theory, autonomy has been studied most prevalently (Sheldon, Elliot, Kim, & Kasser, 2001). Deci and Ryan (1985) contend that only activities of personal value that are associated with perceptions of enjoyment, vitality and autonomy are likely to produce positive behavioral and psychological consequences in a given setting, including positive self-perceptions. "To be self-determined and to develop true self-esteem, people must feel that their successes are truly their own – they must feel autonomous rather than controlled," (Deci & Ryan, 1995, p.43).

Studies have shown that students who perceive their teachers to be autonomy supportive, report higher levels of perceived competence, intrinsic motivation, self-

esteem, desire for challenge, and curiosity than students who perceived a controlling teacher (Deci et al., 1991; Flink, Boggiano, & Barrett, 1990; Ryan & Grolnick, 1986). In a learning/achievement setting, an autonomy supportive teacher is one who accepts students' perspectives, acknowledges their feelings, and provides opportunities for students to make choices, and to be self-directed (Ryan & Deci, 2000). In contrast, a controlling teacher is perceived as exerting pressure on students to behave in particular ways, often through coercive behaviors such as threats, deadlines, pressured evaluations, and imposed goals that reduce intrinsic motivation and the initiative to learn (Grolnick & Ryan, 1987; Ryan & Deci, 2000). Ultimately, the promotion of autonomy and self-determination is necessary for enhancing self-esteem, by providing students with a greater sense of choice and more self-initiated behavior (Deci et al., 1991). Perceptions of the self as autonomous are important in developing and understanding self-esteem, behavior, and motivations (Fox, 1998).

Studies that have examined perceptions of autonomy support have focused on the classroom; no study was found to assess perceived autonomy support in the physical domain (i.e., physical education, sport, or other physical activity settings). Of the research in the classroom, the majority has been done in elementary school classroom settings with little research at the secondary or college classroom environments.

Ryan and Grolnick (1986) studied autonomy versus external control dimensions within elementary school students in Grades 4 to 6. They assessed the relationships among children's perceptions of their classroom climates (as autonomy supporting or controlling), perceived competence, intrinsic motivation, self-esteem, and perceived control. They then focused on the children's perceptions of their classrooms, and how

these perceptions related to a projective story measure. Students looked at a picture of an elementary school classroom, in which the scene was ambiguous, and were asked to write a narrative to the picture. Ryan and Grolnick (1986) found that children in classrooms with an autonomy supportive teacher were more likely to portray themselves as origins. Origins are described as having internal locus of control and being active in classroom decisions. Meanwhile, the students who perceived their teachers to be controlling were more likely to portray themselves as pawns (passive and reactive) in the learning climate. In addition, students who perceived themselves as origins had higher perceptions of self-esteem, self-worth, competence, and mastery motivation than those who perceived themselves as pawns. Ryan and Grolnick (1986) suggested that students who perceived themselves as pawns wrote projective stories that were characterized as displaying higher levels of aggression than the stories by children who saw themselves as origins. It was speculated that the students who perceived themselves as pawns displayed more aggression in their stories because they believed their teacher externally controlled them. The children had been instructed to describe the classroom in any manner they wanted.

In a later study, Grolnick & Ryan (1987) examined the effects of controlling, non-controlling (autonomy supportive), and non-directed learning climates on children in Grade 5. The focus of the controlling climate was on performance, while the non-controlling climate focused on learning. The group of children in the non-directed climate served as a comparison group to examine the effects of the other two groups. Grolnick and Ryan (1987) found that over time, the controlling climate was related to increased perceived pressure, decreased interest in the class, and decreased rote learning. Children within the non-controlling and non-directed climates maintained their rote

learning over time. Grolnick and Ryan (1987) suggested that conceptual learning may be optimized in climates that facilitate autonomous involvement for students.

Flink et al. (1990) examined how fourth grade students' performance levels were affected by controlling versus non-controlling feedback. Teachers were categorized into "pressure" and "non-pressure" conditions based on their teaching techniques. Pressure teachers are those who ensure that students do well on the problems and who see it as the teachers' responsibility to ensure high performance. Non-pressure teachers are facilitators who help students learn to solve problems. The results indicated that the pressure condition was associated with a deterioration in the use of problem solving strategies, presumably because the students' self-determination was decreased (Flink et al., 1990).

Ryan and Connel (1989) studied the correlates of perceived autonomy support in third to sixth graders, in the form of perceived locus of causality. Using perceived locus of causality, autonomy support is measured on a continuum ranging from perceptions of no autonomy to perceptions of autonomy support. The researchers found that the more autonomy support the children perceived, the higher their interest and enjoyment, and the more coping strategies they used. However, lower autonomy support was associated with decreased interest and effort, and a greater tendency to blame others for negative outcomes.

Despite the preponderance of research in elementary school classrooms, perceptions of autonomy support have also been assessed at the secondary school level. Vallerand et al. (1997) examined the relationships among perceived levels of autonomy support from parents, teachers and school administration, perceived academic

competence and autonomy, self-determined motivation, and behavioral intentions to drop out. The sample for this study consisted of 4537 Grade 9 and 10 French Canadian students (M age = 14.97 years). Over the course of a year, a 6% dropout rate was found, with 161 males and 121 females dropping out. Males reported higher dropout intentions than females, and females felt more academically competent and autonomous than males. In addition, females perceived that their teachers and the school administration were more autonomy supportive than did males. Overall, both male and female students who dropped out had lower intrinsic motivation, higher amotivation, and lower perceived autonomy support from parents, teachers and school administrators, than students who continued in school. Students who had low levels of perceived competence and autonomy tended to have low self-determination, which was related to intentions of dropping out of school. This study reinforces that perceptions of autonomy support and self-determined motivation (or lack of) can have real life consequences, one of which is dropping out of high school.

Recently, Black and Deci (2000) examined undergraduate students in an introductory organic chemistry course. The students were assigned to a study group consisting of 6-8 members who met each week for two hours. Black and Deci (2000) hypothesized that those students who were taking the organic chemistry course for relatively autonomous reasons with autonomy supportive instructors would have higher perceived competence, greater interest/enjoyment for chemistry, and less chemistry-related anxiety. They also expected that autonomy-supportive climates would predict students' becoming more autonomous over the term, and that both autonomy support and autonomous motivation would predict performance in the course. Participants completed

a series of questionnaires measuring the levels of autonomy, competence, and interest/enjoyment they felt in the study group, the degree to which they perceived autonomy support from their study group, their anxiety levels, and how focused they were on grades. Autonomy support was measured twice in order to allow for the climate to be monitored over the course of the semester. The results revealed that students with higher autonomous motivation (behavior resulting from volition, self-initiation, self-direction, and integrated from a secure sense of self) (Ryan & Deci, 2000) had more positive experiences, as evidenced through higher perceived competence and interest/enjoyment, and lower anxiety and focus on grades. Increases in perceived competence and interest/enjoyment, along with decreases in anxiety, were noted for students who perceived their study group instructor as autonomy supportive. Additionally, students who perceived their instructors as autonomy supportive performed better in the course. Students who had low autonomy at the start of the course performed significantly better if they perceived their instructor as autonomy supportive. These findings are similar to those found by Williams and Deci (1996) within the medical school context. Williams and Deci (1996) found that instructor autonomy support in a medical interviewing course predicted increases in autonomous motivation, perceived competence, and valuing of psychosocial medicine in medical students.

Perceptions of autonomy support have been shown to be important in the educational context through elementary school to professional degree programs. The studies of Ryan and Grolnick (1986), Grolnick & Ryan (1987), Flink et al. (1990) and Ryan and Connell (1989) indicate the importance of student autonomy within a classroom setting for elementary aged students. These studies have provided evidence of

positive relationships between perceptions of autonomy support and self-esteem, self-perceptions, feelings of control, self-worth, perceived competence, (Ryan & Grolnick, 1986), enjoyment, (Ryan & Connell, 1989) learning, and interest (Grolnick and Ryan, 1987). Perceptions of autonomy support in older students have been associated with intentions to stay in school (Vallerand et al., 1997), better performance in school, increased perceived competence, and lower anxiety levels (Black & Deci, 2000; Williams & Deci, 1996). Despite the promising findings from the research on autonomy support within classroom settings at the university, secondary, and elementary school levels, no study was found to assess perceptions of autonomy support within a physical education or physical activity setting. However, some research in the physical domain has examined perceptions of autonomy. Perceived autonomy and perceived autonomy support are two distinct constructs, yet perceptions of autonomy are related to feelings that autonomy is supported within a given context. Therefore, the research addressing perceived autonomy can provide at least some indirect evidence of relationships between perceptions of autonomy support and self-perceptions in the physical domain.

Goudas et al. (1994) examined perceived autonomy, perceived competence and goal orientations in male and female students aged 12-14 years, in two physical education activities. Females were examined in gymnastics and netball, while males were assessed in gymnastics and soccer. Goudas et al. (1994) found the more self-determined (autonomous) and task oriented the students were, the more likely students were to report higher levels of intrinsic interest in physical education activities. Correspondingly, the lower the perceived autonomy, the lower levels of intrinsic interest. They also reported that perceived competence was positively associated with intrinsic interest for soccer and

netball, but not gymnastics. The students reported the same levels of competence in gymnastics as they did in football and netball, but they reported lower level of intrinsic interest and less self-determination in the gymnastics class. Deci and Ryan (1985) have suggested that competence will be associated with intrinsic motivation only in the context of self-determination (autonomy). The findings suggest that the presence of autonomy within physical education settings influences the level of competence that students perceive. In future studies, measuring the motivational climate for perceptions of autonomy support will be an important step in assessing how perceived competence is affected by the structure of the climate.

In a research study by Goudas et al. (1995a), perceived autonomy, perceived competence, and goal orientations were examined in relation to the teaching styles adopted by instructors. The participants of this study were female students aged 12-13 years, assessed in their track and field class. Teaching styles were identified with respect to Mosston's (1972) spectrum of teaching styles, based on the series of decisions required in the teaching-learning process. The two styles of teaching were classified as direct (most decisions made by teacher) or differentiated (students also have choices). Students experienced lessons, either taught with a direct or differentiated teaching style, and following each lesson completed self-report measures of intrinsic motivation and goal involvement. Results demonstrated that, on average, higher intrinsic motivation was reported by students experiencing the differentiated lessons who felt competent, autonomous, and task oriented compared to those students in the direct lessons. This finding supports the achievement goal theory perspective that individuals tend to perceive

contextual factors or situational cues as congruent with their goal orientations (Duda, 1996; Duda & Whitehead, 1998; Nicholls, 1989).

Finally, in a university setting Goudas et al. (1995b) examined forty undergraduate students in a physical education course for student teachers. They examined the relationships between perceived autonomy, perceived competence, motivational orientations (i.e., intrinsic, extrinsic, amotivation), exam performance, and post course intrinsic motivation. The authors hypothesized that perceptions of autonomy and perceived competence would positively influence performance and intrinsic interest in a compulsory gymnastics course. They found that perceptions of autonomy at the beginning of class were predictive of intrinsic motivation at the end of the class. However, perceived competence did not predict intrinsic motivation. Goudas et al. (1995b) concluded that no matter how competent students felt, they were unlikely to be intrinsically motivated in activities where they perceived no autonomy. Again, this study supports the notion that perceptions of autonomy influence perceptions of competence.

Overall, the research reviewed thus far suggests that perceived mastery inducing and perceived autonomy supporting climates are optimal for heightened self-perceptions, perceived competence, and motivation in physical activity and sport. But how do perceptions of the motivational climate and perceptions of perceived autonomy support relate to each other?

The Relationship between Perceived Autonomy Support and Perceived Motivational Climates. Connections between perceived autonomy and perceived mastery climates have been cited in the literature (Ames, 1992a; Fox, 1997; Kowal & Fortier, 2000). For example, Vallerand et al. (1986) describes mastery climates as allowing for

choice and emphasizing work persistence. Similarly, Ntoumanis and Biddle (1999a) indicated that perceptions of mastery climates were reflective of the degree to which students had (a) choice, (b) pursued individual progress, (c) felt challenged, (d) were supported in their learning efforts. Allowing students or athletes to make their own decisions and to feel choiceful is one of the key components of autonomy support. These examples may appear to suggest that perceived autonomy support and perceived mastery climate are confounding variables, but they are two independent (albeit related) constructs.

Links between perceived autonomy support and perceived performance climates are also evident. Brunel (1999) found that university students in badminton classes who perceived class climates as emphasizing mastery were more likely to feel self-determined (i.e., autonomous) than those who perceived performance climates. With a sample of masters swimmers (aged 18-64 years), Kowal and Fortier (2000) hypothesized that perceptions of a mastery climate would be positively related to perceptions of autonomy, competence, and relatedness. In contrast, the perception of a performance climate was predicted to be negatively related to perceptions of autonomy, competence, and relatedness. The findings of this study confirmed that individuals with higher perceptions of performance climates had lower perceptions of autonomy, but perceptions of a mastery climate were not associated with perceptions of autonomy. Although the predicted relationship between a perceived mastery climate and perceived autonomy was not found, the negative relationship between a perceived performance climate and perceived autonomy, nevertheless, leads to a recommendation to teachers to emphasize a mastery climate over a performance one.

In general, students have been found to respond positively to mastery climates that allow them to be involved in decisions and enable them to make choices (Ames, 1992a; Brunel, 1999; Goudas et al., 1995a; Kowal & Fortier, 2000; Ntoumanis & Biddle, 1999a; Ryan & Connell, 1989; Ryan & Grolnick, 1986; Treasure & Roberts, 1995). The potential rationale for this finding is that mastery climates appear to improve and allow for autonomy.

Examination of perceived autonomy support in the physical activity domain is needed because these perceptions have been found to reflect positive improvements in learning in other domains, through interest, enjoyment, challenge and choice (Black & Deci, 2000; Flink et al., 1990; Grolnick & Ryan, 1987; Ryan & Grolnick, 1986). More importantly, perceptions of autonomy support within the classroom context have been positively associated with self-esteem, self-worth (Ryan & Grolnick, 1986), and perceived competence (Black & Deci, 2000; Ryan & Grolnick, 1986; Vallerand et al., 1997; Williams & Deci, 1996). The benefits of perceptions of autonomy support and perceptions of mastery climates have been expressed across elementary, secondary and college levels.

Fox (1997) suggests that perceived mastery and perceived autonomy may be just as important in determining self-esteem as is perceived ability. He recommends that future research examining competencies and attributes that contribute to self-esteem should also address the influence of perceived mastery and perceived autonomy. Fox (1997) indicated that investigation of a connection between perceived mastery and perceived autonomy might provide a better understanding of physical self-perceptions. "It

is possible that autonomy could be included as an extra facet in self-perception hierarchies," (Fox, 1997, p.133).

Instrumentation

Instruments Used to Assess the Perceptions of the Motivational Climates. There have been a number of instruments designed to measure the motivational climate. One of the most prevalently used measures is the Perceived Motivational Climate in Sport questionnaire (PMCSQ) created by Duda and her students to measure mastery and performance climates (Seifriz et al., 1992). The PMCSQ is based on the Classroom Achievement Goals questionnaire devised by Ames and Archer (1988). The objective of the PMCSQ was to tap the perceptions of the situations rather than the goal perspectives already internalized (Duda & Whitehead, 1998). The items in the PMCSQ measure perceptions of mastery climates and perceptions of performance climates, as determined by the teacher. Specifically, items make reference to the goals emphasized by the teacher, the behaviors that are reinforced by the teacher, the organization of the class etc. The PMCSQ was developed and originally used in the United States but has also demonstrated validity and reliability in children, youth, adults, athletes and non-athletes; in sport, recreational, and instructional contexts; in several different countries (Barnes, Page, & Mc Kenna, 1996; Causgrove Dunn, 2000; c.f. Duda & Whitehead, 1998; Goudas, 1998; Ommundsen, Roberts, & Kavussanu, 1998).

Other instruments have been created to measure the motivational climate, but few have been as successful as the PMCSQ in terms of reliability. Papaioannou (1994) constructed a motivational climate measure specifically for physical education, entitled the Learning and Performance Oriented Physical Education Climate questionnaire

(LAPOPECQ). This instrument assesses students' perceptions of learning (i.e., mastery) and performance orientations in physical education classes. Factor analysis of the LAPOPECQ reveals five factors: two learning factors examining (1) teacher initiated learning and (2) student learning orientation, and; three performance factors including (1) competitive orientation, (2) worries about mistakes and (3) outcome orientation (Papaioannou, 1995). The internal consistencies of these five factors range from $\alpha = .64$ to $\alpha = .84$. This indicates a high degree of congruency across items in measuring the same construct. The LAPOPECQ was created with Greek students (in Greek), and has not been widely used with students from other cultures.

Goudas and Biddle modified the LAPOPECQ, to include other features of the classroom that they felt promoted mastery goal structures in physical education (Duda & Whitehead, 1998). Specifically, two new subscales were added to the LAPOPECQ: (1) perceived teacher support and (2) perception of student choice. In addition, Goudas and Biddle dropped the outcome orientation subscale. Although a rationale was not provided, this subscale has often demonstrated poor reliabilities (Duda & Whitehead, 1998). The new (i.e., modified LAPOPECQ) scale was named the Physical Education Class Climate Scale (PECCS) (Goudas & Biddle, 1994) designed for students aged 12-18 years. Factor analysis of the PECCS revealed a six-factor solution with several items cross loading onto different factors, and other items being deleted to obtain acceptable internal consistency (Ntoumanis & Biddle, 1999a). The present form of the PECCS cannot be used as a valid measure of the perceived motivational climate in school physical education classes as it has not been extensively validated, and the validation to date has not been encouraging (Biddle et al., 1995). The initial development of the PECCS was

with French speaking students with promising results, however, the translated version has not been as hopeful. The internal consistencies of the PECCS subscales are low (α = .64 - .77).

Instruments Used to Assess Perceived Autonomy Support. To date, a number of different measures have been used to assess perceived autonomy support and the related construct of controllingness (Flink et al., 1990; Grolnick & Ryan, 1987; Ryan & Connell, 1989; Ryan, & Grolnick, 1986; Williams & Deci, 1996). These measures have included the Learning Climate Questionnaire (LCQ) (Williams & Deci, 1996), the Multidimensional Measure of Children's Perceptions of Control (MMCPC) (Ryan & Grolnick, 1986), Problems in School Questionnaire (designed to assess teaching strategies) (Flink et al., 1990), and the Academic Motivation Scale (AMS) (Goudas et al., 1995b; Vallerand et al., 1997). In addition, a self regulation questionnaire (assesses children's reasons for doing various activities) which is used with the Relative Autonomy Index (RAI) to indicate the degree to which a child is more or less self determined in an achievement domain (Grolnick & Ryan, 1987), has been employed. The inconsistency in instrument used suggests there is no gold standard. Nevertheless, the newest of these measures, the LCQ, demonstrates good psychometric properties thus far.

The Learning Climate questionnaire (LCQ) assesses the student's perception of autonomy supportiveness by their instructor (s) (Williams et al., 1996). The LCQ was derived from the Health Care Climate questionnaire (HCCQ) (Williams et al., 1996). The HCCQ is comprised of fifteen items that assess participants' perceptions of the degree to which a context is autonomy supportive versus controlling (Williams et al., 1996). The HCCQ demonstrated excellent internal consistency (α=.95) and factor

analysis revealed a one-factor solution measuring perceived autonomy support (Williams et al., 1996). The HCCQ and the LCQ represent two questionnaires from a family of perceived autonomy support questionnaires. These questionnaires assess individuals' perceptions of the degree to which a particular social context is autonomy supporting versus controlling (Black & Deci, 2000; Williams & Deci, 1996). Similar to the HCCQ, the LCQ has 15 items that reflect the degree to which the students' perceive the instructor or instructors as supporting their autonomy (Williams & Deci, 1996). The LCQ also has been found to have an excellent internal consistency (α=.95) and factor analysis has found a one-factor solution, measuring perceived autonomy support (Williams & Deci, 1996).

Multidimensional Physical Self-Concept Instruments. The PSPP is one of two comprehensive self-concept instruments that have been developed (Fox, 1998). The Physical Self-Description Questionnaire (PSDQ) developed by Marsh in 1992 is the other. Similar to the PSPP, the PSDQ is used within the physical domain and employs multidimensionality and hierarchical postulates of the Shavelson et al. model (1976). The PSDQ instrument is composed of six subscales of physical concept and five subscales of physical fitness, which are reflected in 70 items (Marsh et al., 1994). The subscales of the PSDQ include strength, body fat, activity, endurance/fitness, sports competence, coordination, appearance, flexibility, and health and one subscale to assess physical and global self- concept. The PSDQ was developed in Australia with high school students aged 12-18 years (Sonstroem, 1997). Fox (1998) suggests that further validation of the PSDQ is needed on more diverse samples, as much of the research to date has continued to focus on Australian adolescents. Sonstroem (1997) recommends

that continued use of both the PSPP and the PSDQ because these instruments are consistent with current views of a multidimensional, hierarchical structure of physical self-perceptions. As such, use of these instruments will increase our understanding of self-concept as they relate to physical activity.

Purpose of the Study

The primary purpose of this study was to investigate the relationships among perceptions of mastery and performance motivational climates, perceptions of autonomy support, and physical self-perceptions of male and female university and college students enrolled in Level I physical activity classes. It was hypothesized that perceptions of autonomy supportive and mastery climates would be positively related to physical self-perceptions. In contrast, it was expected that perceptions of a performance climate would be negatively related to physical self-perceptions.

Relationships were also predicted among the perceived motivational climate and perceived autonomy support variables. Given that the literature demonstrates a positive link between perceived autonomy and perceived mastery climates, it was anticipated that students who perceived the climates as more mastery inducing would also perceive greater autonomy support from their instructors. This prediction is also consistent with Ames' (1992a) TARGET strategies, which indicate that autonomy support is needed in the perception and creation of mastery climates. In contrast, students who perceived the climates as more performance inducing would perceive less autonomy support from their instructors.

Although not a purpose of the study, sex differences were expected on physical self-perceptions. Consistent with the findings of previous research (Fox & Corbin, 1989:

Hayes et al., 1999; Welk et al., 1995), it was expected that males would have higher physical self-perceptions than females. In addition, it was predicted that males and females would differ in their responses to the LCQ. Research has found that in general women tend to have a more self-determined profile compared to men (Vallerand & Bissonnette, 1992; Vallerand et al., 1997).

Although, one study by Kavussanu and Roberts (1996) indicated that males perceive the climate to be more performance inducing than females, and females perceive the climate as more mastery inducing than males, very few studies have reported sex differences on the PMCSQ. One of the most recent analyses of motivational climate instrumentation did not refer to sex differences on the PMCSQ (Duda & Whitehead, 1998). Furthermore, sex differences were not found in a study by Ebbeck and Becker (1994) and no sex differences were reported on the PMCSQ in a study by Walling et al. (1993). Therefore, no sex differences were expected on the PMCSQ.

Chapter 3

Method

Participants

The participants for this study were 398 students (180 males and 218 females) enrolled in Level One physical activity classes at either Grant Mac Ewan Community College (GMCC) or the University of Alberta (U of A) during the fall term of 2000. This included 331 students (147 males and 180 females) from the University of Alberta (M age = 21.49 years, SD = 3.03) and 71 students (33 males and 38 females) from Grant Mac Ewan (M age = 20.17 years, SD = 2.37). Overall, the mean age of the participants was 21.26 years (SD = 2.97) and participants were predominantly white Canadian students.

Physical Education Context

Physical activity classes (PAC) at the U of A and GMCC operate with the following two basic objectives: (1) the acquisition of basic skills and appreciation of how these skills are used in combination in performance situations, and (2) the development of theoretical knowledge of any concepts relevant to the activity (GMCC 2000-2001; University of Alberta, 2000-2001). However, at both schools, 75% of students' evaluations in Level one PAC classes is derived from skill testing, and grades are based in part on interclass performance rankings. It appears, therefore, that PAC classes at the U of A and GMCC can be viewed as emphasizing performance and mastery motivational climates. The evaluation of skill in comparison to other students is a quality of perceived performance climates, but the focus on the acquisition of basic skills is a characteristic of perceived mastery climates. Despite the definition and structure of PAC classes, students

may perceive these classes differently depending on their own dispositional goals, the goals adopted by their respective instructors, and peers.

Procedures

The physical activity course instructors were contacted and asked to take part in the study. All course instructors agreed to allow their classes to participate and they were provided with the statements of purpose and rationale to ensure their awareness of the project (see Appendix B). To ensure minimal disruption of classes, data collection took place immediately before or after classes, unless the instructor gave special permission to use class time. Data were gathered on one occasion from each class. In all cases data was collected after the class had been in session for at least one month.

Students were given a brief summary outlining the purpose of the research project and an information letter outlining the potential benefits of participation (see Appendix C), by the investigator. Participation was voluntary and each student who participated completed a consent form (see Appendix C). The investigator explained that the questionnaires would provide information about students' perceptions of their physical activity classes and themselves physically, in an effort to ultimately improve similar classes in the future. Participants were assured that course instructors would not have access to their responses, and that all of the answers would remain confidential and anonymous. A questionnaire package was then distributed to the students consisting of a sheet of paper requesting demographic information (year of study, program, age, sex, experience in current PAC class, and perceived level of ability in current PAC class) and the following three questionnaires: the PSPP (Fox & Corbin, 1989), the PMCSQ (Seifriz et al., 1992) and the LCQ (Williams & Deci, 1996) (see appendix D). The presentation

order of the questionnaires was counter balanced within the package in an effort to avoid an order effect. Students who were registered in multiple physical activity classes were asked to complete the questionnaire package in only one class.

After handing out the questionnaires, the investigator either explained verbally or explained and demonstrated how to complete the questionnaires. Care was taken to explain the response formats for the LCQ and PMCSQ (based on a Likert scale) in contrast to the PSPP (based on structured alternative response format). In classes where a chalkboard was available, a sample item from the PSPP was completed by the researcher on the chalkboard. In classrooms where no chalkboards were available, this item was presented and completed verbally by the researcher. Participants were directed to verbally choose only one response on the Likert scale for both the PMCSQ and LCQ. The majority of students took 15 minutes to complete the questionnaire package. The range in time to complete the questionnaires was between 10 and 20 minutes.

Measures

Physical Self-Perceptions. The PSPP (Fox & Corbin, 1989) was used in this study to assess the physical self-perceptions centered on competencies and appearance among university and college students within physical domains. The PSPP measures perceptions of sport competence, body attractiveness, physical conditioning, strength, and physical self-worth. This measure consists of 30 items, with 6 items on each of the five subscales. The PSPP is arranged on a structured alternative format where subjects read two statements and respond beside the one that depicts how they tend to feel (see Appendix D).

Research suggests that the PSPP demonstrates adequate reliability and factorial validity. For example, factor analysis of the PSPP items by Marsh and Sonstroem (1995) resulted in the identification of the specific factors that the instrument was designed to measure. The reported internal consistency estimates of reliability have been excellent (α = 0.80 - 0.92) (Marsh & Sonstroem, 1995; Sonstroem, 1997, 1998). Sonstroem and Potts (1996) contend that physical self-concept measured by the PSPP is not prone to conscious response distortion, which is the tendency to respond to items in a socially desirable fashion.

The PSPP has been used and was reported to be reliable and valid in a number of cultural samples extending over a wide range of age groups, including elementary school students in Canada and the United States (Crocker et al., 2000; Eklund, Whitehead, & Welk, 1997), secondary school students in the United States and Australia (Marsh et al., 1994; Welk et al., 1995), college students in the United States (Fox & Corbin, 1989; Sonstroem & Potts, 1996), Canada (Hayes et al., 1999; Kowalski et al., 2001), England (Page et al., 1993), and Turkey (Asci et al., 1999), middle aged males and females (aged 31-66 years) in the United States (Sonstroem et al., 1992), obese males and females attending treatment (Fox & Dirkin, 1992), female aerobic dancers in the United States (Sonstroem et al., 1994), and British men and women (aged 18-55 years) in a corporate health and fitness club (Daley & Parfitt, 1996).

The PSPP was selected for use in this study as a result of the "extensive psychometric scrutiny during its development" (Page et al., 1993, p.585), and its previous use in university and college settings in Canada. The PSPP is one of two self-concept measures that have been recommended by Sonstroem (1997, 1998) and Fox (1998) for

future use in addressing physical self-perceptions, physical self-worth, and self-esteem within the physical domain.

Perceptions of the Motivational Climate – Mastery and Performance Climates. The PMCSQ (Seifriz et al., 1992) was developed by Duda and her colleagues to measure perceptions of mastery and performance motivational climates deemed to be operating in sport (Seifriz et al., 1992). The PMCSQ has 21 items, with 12 items referring to perceptions of a performance climate and 9 items referring to perceptions of a mastery climate. The mastery items relate to an emphasis on improving skills, working hard, and having an important role on a team. The performance items focus on performing better than others, intra-team rivalry, unequal recognition (e.g., perceptions that the coach pays more attention to athletes who are more talented), and punishment for mistakes.

Factorial validity was reported by Seifriz et al. (1992), who found that the items loaded on two main factors indicative of the mastery and performance climate subscales. However, three items revealed poor factor structure by cross loading on both factors. Seifriz et al. (1992) reported these two factors accounted for 39.70 % of the variance. Walling et al. (1993) conducted confirmatory factor analysis on the original items of the PMCSQ derived by Seifriz et al. (1992). The initial goodness of fit indicators were acceptable, albeit low (GFI = .770, RMSR = .108, χ^2 / df = 2.93), suggesting there was room for improvement. A second confirmatory factor analysis was run on a modified model, resulting in improvements in the overall goodness of fit of the data. Internal consistency estimates are α = .80 - .81 for the mastery subscale and α = .73 - .84 for the performance subscale (Seifriz et al., 1992; Walling et al., 1993).

Causgrove Dunn (2000) used exploratory factor analysis (principal components analysis) on a version of the PMCSQ that had been modified for use with children in physical education classes. Causgrove Dunn (2000) found there were six factors with eigenvalues greater than 1.0 but after examining the scree plot, concluded that only two of these were important. These two factors accounted for 37.60% of the variance, and demonstrated excellent simple structure with all of the twenty-one items retained and loading on the appropriate factor (Causgrove Dunn, 2000). Internal consistency estimates were $\alpha = .74$ for the mastery subscale and $\alpha = .85$ for the performance subscale. This was the version of the PMCSQ used in the present study, after it was further modified to remove the word "teacher" from all items (see Appendix D).

The PMCSQ has been used with research participants that span a wide range of ages, including youth (10-19 years old) (Ebbeck & Becker, 1994; Goudas, 1998; Seifriz et al., 1992; Solmon, 1996; Walling et al., 1993), university students (Kavussanu & Roberts, 1996), and international and amateur athletes (Barnes et al., 1996; Weigand & Davis, 1996). The PMCSQ has been used in sport (Ebbeck & Becker, 1994; Goudas, 1998; Seifriz et al., 1992; Walling et al., 1993), and physical education (Causgrove Dunn, 2000; Solmon, 1996), including university level classes (Kavussanu & Roberts, 1996). Many of these studies have used modified versions of the PMCSQ to better suit the specific sample and context of the study (Causgrove Dunn, 2000; Goudas, 1998; Solmon, 1996; Walling et al., 1993). These modified versions of the PMCSQ have demonstrated validity and reliability, with similar internal consistencies estimates for mastery subscales ($\alpha = 0.72$ to 0.80) and performance subscale ($\alpha = 0.67$ to 0.84) in all four studies (Causgrove Dunn, 2000; Goudas, 1998; Solmon, 1996; Walling et al., 1993).

The PMCSQ was selected for this study as it has been previously used in the university setting to measure perceptions of the motivational climates in physical education courses (Kavussanu & Roberts, 1996). The present investigation used a modified version of the PMCSQ. Specifically, the version used by Causgrove Dunn (2000) to assess individual differences in perceptions of the motivational climate during physical education classes was used. One further modification was needed for this study was the removal of the word "teacher" from all items. For example one item read, "The teacher focuses on skill improvement". This item was changed to read, "The class is structured to focus on skill improvement". The rationale for removing references to the teacher was that research has demonstrated that peers and other students also have an influence on students' perceptions of the motivational climate (Bibik, 1999; Jacaginski & Nicholls, 1987; Utman, 1997).

Perceived Autonomy Support. The LCQ is one instrument within a collective group of measures designed to capture perceptions of autonomy supportive climates across a broad array of settings. These questionnaires assess the degree to which individuals perceive particular contexts to be autonomy supporting. There are currently four of these measures, including the Health Care Climate Questionnaire (HCCQ), the Learning Climate Questionnaire (LCQ), the Work Climate Questionnaire (WCQ), and the Sports Climate Questionnaire (SCQ).

The LCQ is a 15-item measure that asks students about the degree to which their instructor supports their autonomy, adapted from the HCCQ (Williams et al., 1996). The LCQ has not been previously used in the physical domain, but has been validated within the education field (Williams & Deci, 1996). Factor analysis has revealed a one-factor

solution measuring perceived autonomy support (Williams & Deci, 1996), and the LCQ demonstrated excellent reliability, $\alpha = 0.93$-0.96 (Black & Deci, 2000; Williams & Deci, 1996). In a medical school-interviewing course, perceived autonomy supportive learning climates (as assessed by the LCQ) were associated with students becoming more autonomous and feeling more competent. Perceptions of autonomy support have been measured at the elementary (Flink et al., 1990; Grolnick & Ryan, 1987; Ryan & Connell, 1989; Ryan & Grolnick, 1986), secondary (Vallerand et al., 1997) and more recently at the undergraduate level (Black & Deci, 2000), but the LCQ was used only in the undergraduate context.

The LCQ (see Appendix D) was deemed an acceptable instrument for use within this study as this instrument has been utilized within the university setting. However, the LCQ has not been used within the physical domain, and therefore this study serves to explore the potential of this instrument within the physical activity contexts.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (e.g., M, SD, mode) were calculated for the demographic variables. Each of the three instruments (PSPP, PMCSQ, LCQ) were subjected to factor analyses, in order to assess their factorial validity in the present study. Following factor analyses, internal consistency estimates (coefficient alpha) were calculated for each of the subscales, along with descriptive statistics (means, standard deviations, ranges). Finally the relationship between the perceived motivational climates and physical self-perceptions were assessed using both correlation and regression analyses.

Chapter 4

Results

Demographics

Table 1 provides the demographic profile of the results of the descriptive analysis of the study participants. The mean age of the participants was 21.26 years (SD = 2.97), with the largest proportion (29.2%) of students in their fourth year of post-secondary education. Students from 25 different programs took part in this study although the majority of students came from physical education (44.4%), education (21.2%), and a combined program in physical education and education (18.4%) (see Appendix A). A total of 32 classes participated, in 19 different activities. The students' perceived levels of ability in their respective physical activity classes was as follows: 41% rated themselves as beginners, 44.2% rated themselves at the intermediate level, and 14.8% rated themselves as advanced. In accordance with these ratings, 41.6% of students indicated that they had no prior experience in the specific relevant activity area prior to their participation in the current class. An additional 19.6% of participants reported having only 1-2 years of experience in the activity being taught in their class.

Table 1

Descriptive Statistics for Demographic Variables Measured

	N	M	SD	Mode
Age	390	21.26	2.97	21.00
Year of Study	377	2.84	1.14	4
Skill Level	398	1.74	0.70	2
Experience	397	1.65	1.95	0
Involvement	398	2.86	2.05	1

Note. **Skill Level:** (1) = beginner, (2) = intermediate, (3) = advanced. **Experience:** 0 = none, 1 = 1-2 years, 2 = 3-4 years, 3 = 5-6 years, 4 = 7-8 years, 5 = 9-10 years, 6 = >10 years. **Involvement:** 1 = never before, 2 = secondary, 3 = recreational, 4 = city/club, 5 = university/college sport, 6-12 were a combination of 1-5.

Psychometric Analysis of the LCQ

The psychometric analysis of the LCQ was conducted on males and females separately, due to research that has demonstrated that women tend to have a more self-determined profile compared to men (Vallerand & Bissonnette, 1992; Vallerand et al., 1997). In studies women tend to score higher on measures assessing perceptions of autonomy. Exploratory principal axis analyses was used to assess the underlying factor structure. This was necessary because this instrument has never been used in a physical activity context before, therefore, there was no evidence to support its validity in this context. For females, two factors emerged with eigenvalues greater than 1.0. The first factor had an eigenvalue of 9.66 while the second factor had an eigenvalue of 1.01. Not surprisingly, the scree plot suggested that only the first factor was important (see Figure 2). As a result, one factor was retained and no methods of rotation were employed. The

factor accounted for 62.07% of the variance, and all of the items had a factor loading greater than .41.

For males, the initial analysis also revealed two factors with eigenvalues greater than 1.0 (7.38 and 1.31 respectively), and the scree plot again indicated one predominant factor (see Figure 3). However, the factor loading for item 13 (*I don't feel very good about the way my instructor talked to me*) on this factor was low (.16). Therefore, a subsequent analyses was run with item 13 deleted, which resulted in two factors with eigenvalues greater than 1.0 (7.36 and 1.10 respectively). The predominant factor was retained, accounting for 49.07% of the variance. Factor loadings for all of the remaining items ranged from .53 to. 81 (see Table 2).

Internal consistency estimates (α) were computed for the LCQ scale for males and females separately. The literature suggests that reliabilities above .70 are deemed acceptable for the measurement of psychological constructs (Devellis, 1991). For the LCQ, values (coefficient alpha) of .96 and .93 were found for females and males, respectively. Thus, the LCQ demonstrated excellent internal consistency for both sexes.

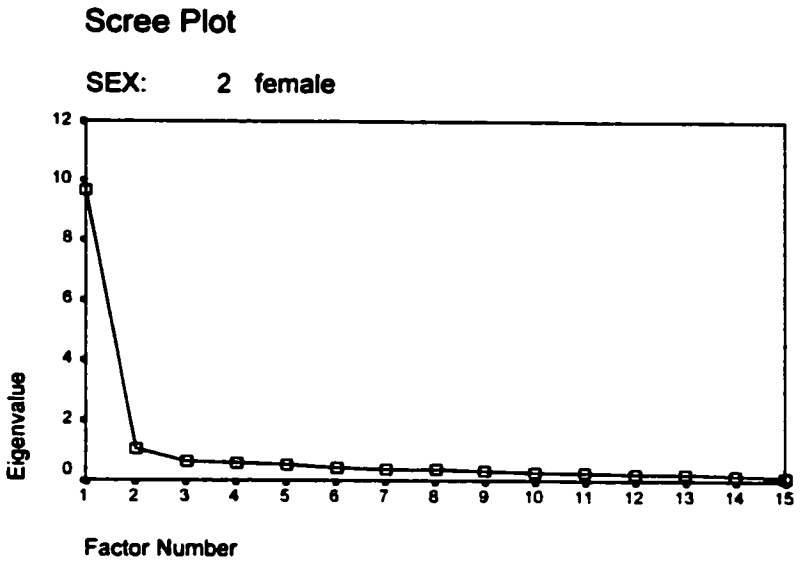

Figure 2. Scree plot from factor analysis of females' LCQ items.

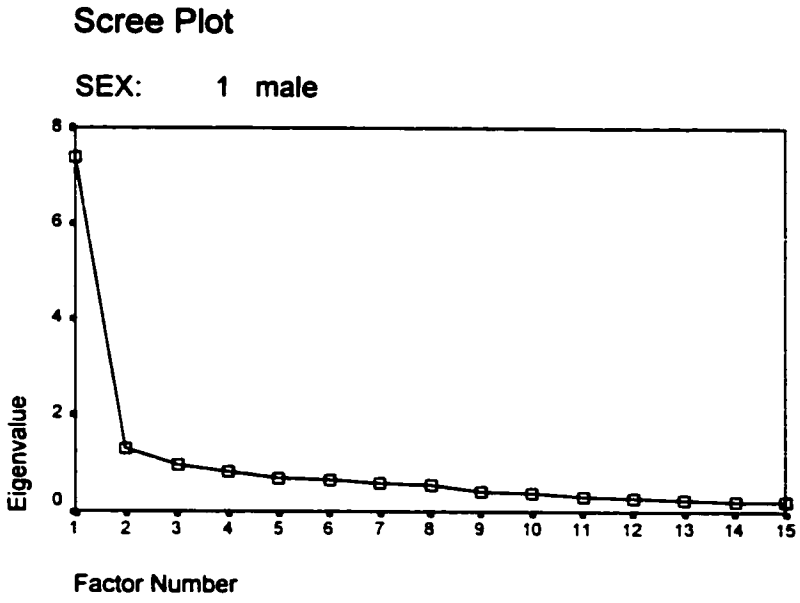

Figure 3. Scree plot from factor analysis of males' LCQ items

Table 2

Principal Axis Analysis Solutions on the LCQ for Males and Females

Abbreviated Items	Males	Females
Provided me with choices	.666	.751
I felt understood	.749	.863
Able to be open during class	.681	.836
Had confidence in my ability	.727	.819
Accepted me	.720	.835
Made sure I understood goals	.595	.780
Encouraged questions	.615	.826
Feel a lot of trust	.801	.827
Answered my questions	.809	.813
Listened to	.721	.834
Handles emotions well	.730	.797
Cares about me	.740	.862
I don't feel very good about way my instructor talked to me	---	.413
Tried to understand how I saw things	.534	.745
Able to share my feelings	.665	.707
% variance	49.065	62.067
Eigenvalue	7.359	9.66
Cronbach's α	.9269	.9576

Note. Item LCQ13 was removed from the factor analysis for males, as the factor loading for this item was <.30.

Psychometric Analysis of the PMCSQ

Because previous research has indicated that sex differences are rarely found on the PMCSQ, the data from males and females were combined for factor analytic purposes (c.f. Duda & Whitehead, 1998; Ebbeck & Becker, 1994). Exploratory factor analysis was used because modifications were made to the original items used in previous research (Causgrove Dunn, 2000; Walling et al., 1993). The physical activity class data was subjected to principal axis analysis, followed by orthogonal rotation (varimax) and

oblique transformation (direct oblimin, delta = 0). Four factors were found to have eigenvalues greater than 1.0. However, the scree plot (see Figure 4) indicated that only two of these factors should be retained. The oblique transformation demonstrated a superior solution. Two items demonstrated poor simple structure (*Students feel good when they do better than other classmates* and *Students are punished for mistakes*) and were deleted. A second principal axis factor analysis with varimax rotation and direct oblimin transformation (delta = 0) was run on the remaining nineteen items. The solution for this second factor analysis revealed three factors with eigenvalues (λ) greater than 1.0, however the scree plot again suggested the retention of only two of these. The direct oblimin solution was chosen because it demonstrated better simple structure (see Table 3). Factor one contained ten items measuring perceptions of a performance motivational climate. The second factor contained nine items measuring perceptions of a mastery motivational climate. The correlation between the factors was $\underline{r} = -.331$, and the two factors accounted for 41.94% of the total variance.

Internal consistencies of the two PMCSQ subscales, using Cronbach's (1951) alpha, were 0.84 for the performance subscale, and 0.88 for the mastery subscale.

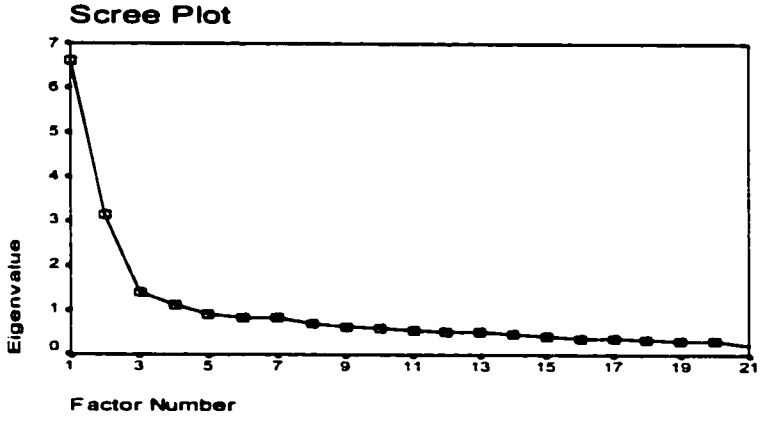

Figure 4. Scree plot from factor analysis of males' and females' PMCSQ items

Table 3

Direct Oblimin Solution for Principal Axis Analysis on the PMCSQ

Item Abbreviations	Performance	Mastery
Everyone wishes they were the star student	.689	
Some students are favored	.685	
Doing better than others is important	.684	
Students are encouraged to do better than other students	.657	
Doing better than other students is important	.651	
Only the best students get noticed	.644	
Most of the attention to the "best students"	.619	
Only a few students can be the "stars"	.601	
Students are afraid to make mistakes	.471	
Students are criticized for mistakes	.327	
The class enables us to try new skills		.698
Each student's improvement is important		.689
Students try hard to learn new skills		.644
The class focuses on skill improvement		.641
Everyone gets to try every position in every activity		.639
Students are encouraged to work on their weaknesses		.603
Trying hard is rewarded		.586
Students like playing and competing against good students		.562
All students in class have an important role		.534
Eigenvalues	6.30	2.81
Cronbach's α	.8645	.8596

Note. Only factor loadings greater than .30 are reported.

Psychometric Analysis of the PSPP

The 30 items of the PSPP were factor analyzed to assess the underlying factor structure. Items from the four physical self-perception subdomain scales and physical self- worth subscale were included. The data from males and females were analyzed separately because of previous research that has demonstrated that males score significantly higher on virtually all PSPP subscales than females (Fox & Corbin, 1989; Hayes et al., 1999; Welk et al., 1995). Table 4 represents the results of factor analysis for females.

Table 4

Direct Oblimin Solution for Principal Axis Analysis of the PSPP (Females)

Item Abbreviations	PSW	Strength	Sport	Condition	Body
Happy or not with physical appearance	.729				
Satisfied or not physically	.619				
Confident or not physically	.529				
Positive or negative feeling physically	.469				
Proud or not physically	.358				
Feel or don't feel stronger than others		.851			
Feel or don't feel strong		.763			
Feel or don't feel muscular		.709			
Intervene or not when strength is needed		.620			
Good or not with strength		.564			
Confident or not in strength		.496			
Good or not in sports			.758		
Good or not playing sports			.754		
Good or not in athletic ability			.649		
First or not to join in sports			.633		
Do or do not learn skills quickly			.603		
Confident or not in sports			.601		
Do or do not exercise vigorously				.737	
Do or do not maintain condition				.687	
Confident or not in exercise				.616	
Do or do not have stamina				.594	
Feel good or not in exercise				.418	
Do or do not have an attractive body					.762
Embarrassed by body or not					.644
Physique attractive or not					.640
Do or do not maintain an attractive body					.637
Do or do not look in shape					.592
% Variance	34.37	9.91	6.12	3.69	2.78
Eigenvalues	9.71	3.09	2.06	1.42	1.15
Cronbach's α	.8575	.8704	.8777	.8449	.8507

Principal axis analysis was used to examine the underlying factor structure of the PSPP responses in females, followed by varimax rotation and direct oblimin transformation (delta = -1). The first analysis obtained 5 factors with eigenvalues greater than 1.0 (see Table 4). The direct oblimin solution demonstrated better simple structure than the varimax but two problematic items (*Some people wish that they could have more respect for their physical selves* and *Some people are extremely confident about the appearance of their body*) demonstrated poor simple structure. These two items were deleted, and a second principal axis was conducted on the remaining 28 items. Again five factors were retained, and the direct oblimin solution (delta = -1) revealed better simple structure. However, one item (*Some people are not very confident about their level of physical conditioning and fitness*) revealed complexity two and was deleted. A third principal analysis was performed. The direct oblimin transformation solution (delta = -1) revealed five factors with 27 items demonstrating simple structure (see Table 4). These five factors were named physical self-worth (5 items), strength (6 items), sport competence (6 items), conditioning (5 items), and body attractiveness (5 items), and together accounted for 56.87% of the total variance. The correlations between the factors are shown in Table 5.

For males, principal axis analysis was conducted with orthogonal rotation (varimax) and oblique transformation (direct oblimin, delta = 0). The analysis extracted 5 factors with eigenvalues (λ) greater than 1.0. The solution form the oblique transformation was retained because it demonstrated better simple structure. One of the factors contained only two items, and nine items demonstrated complexity two. Items

Table 5

Correlation Among PSPP Factors (Females)

Variable	1	2	3	4	5
PSW	-				
Strength	.222	-			
Sport	-.341	-.284	-		
Condition	-.368	-.298	.297	-	
Body	-.401	.070	.161	-.328	-

that were cross loading on more than one factor were removed and the factor analysis was re-run using principal axis analysis. Specifically, items 2 (*Some people are not very confident about their level of physical conditioning and fitness*), 10 (*Some people are sometimes not so happy with the way they are or what they can do physically*), 12 (*Some people do not usually have a high level of stamina and fitness*), 15 (*When it comes to the physical side of themselves some people do not feel very confident*), 16 (*Some people feel that they are always one of the best when it comes to joining in sports activities*), 17 (*Some people tend to feel a little uneasy in fitness and exercise settings*), 23 (*Some people feel that compared to most, their bodies do not look in the best of shape*), 25 (*Some people wish they had more respect for their physical selves*), and 26 (*Given the chance, some people are always one of the first to join in sports activities*) were deleted.

The second factor analysis resulted in four factors with eigenvalues greater than 1.0. The better-fitting oblique solution revealed there were three items lacking simple structure. Items 6 (*Some people feel that they are among the best when it comes to*

athletic ability), 19 (*Some people tend to lack confidence when it comes to their physical strength)*, and 24 (*Some people feel that they are very strong and have well developed muscles compared to most people*) were removed and a third principal axis analysis was run on the 18 remaining items. Four factors were obtained with eigenvalues greater than 1.0, accounting for 52.75% of the variance. The oblique transformation was easily interpretable with all 18 items demonstrating excellent simple structure (see Table 6). The four factors were: physical self-worth (8 items), strength (4 items), sport competence (3 items), and conditioning (3 items). The correlations between the factors are shown in Table 7.

A similar four-factor solution has been previously found in the work of Sonstroem et al. (1994). The body attractiveness subscale and physical self worth subscales from the original model (Fox & Corbin, 1989) seemed to collapse into one factor instead of two. This new factor was labeled physical self-worth. The internal consistency coefficients for the 5 PSPP subcales for women were as follows: α = .88 for sport competence; α = .87 for strength; α = .84 for conditioning; α = .86 for physical self-worth; and α = .85 for body attractiveness. The internal consistency coefficients for the four remaining PSPP subscales for men were as follows: α = .79 for sport competence; α = .79 for strength; α = .80 for conditioning; and α = .87 for physical self-worth.

Table 6

Direct Oblimin Solution for Principal Axis Analysis of the PSPP (Males)

Item Abbreviations	PSW	Sport	Strength	Condition
do or do not maintain attractive body	.748			
Confident or not about body	.672			
have or don't have attractive body	.669			
Embarrassed by body or not	.620			
Satisfied or not physically	.579			
Physique attractive or not	.564			
proud or not proud of physicality	.478			
Positive or negative feeling about physical	.426			
good or not good at playing sports		.730		
Confident or not in sports		.727		
slower learning new sport skills		.691		
feel or don't feel stronger than others			.865	
feel or don't feel strong			.813	
Intervene or not when strength is needed			.574	
good or not with strength			.469	
do or do not exercise vigorously				.744
do or do not maintain condition				.724
Confident or not with condition				.536
Eigenvalues	6.52	2.06	1.58	1.11
Cronbach's α	.8695	.7889	.8185	.7840

Table 7

Correlations Among PSPP Factors (Males)

Variable	1	2	3	4
PSW	-			
Sport	.269	-		
Strength	.476	.152	-	
Conditioning	-.556	-.285	-.307	-

Sex Differences

Because the subscales of the LCQ and PSPP did not demonstrate similar factor structures for males and females, the data provided by these two groups could not be combined for subsequent analyses. Further, subscale scores could not be compared between sexes because they were not comprised of the same items (or the same number of items) for males and females.

Descriptive Analysis

The means and standard deviations of the LCQ, PMCSQ and PSPP subscales are located in Table 8. The means, standard deviations and ranges of each item in the LCQ (7-point scale), PMCSQ (5-point scale) and PSPP (4-point scale) are located in Appendix E.

Table 8

Means and Standard Deviations for the LCQ, PMCSQ, and PSPP Subscales

	Males		Females	
Subscale	M	SD	M	SD
Autonomy Support	5.54	.875	5.36	1.13
Mastery	4.05	.667	3.92	.751
Performance	2.81	.757	2.85	.854
PSW	2.86	.559	2.79	.606
Body	-	-	2.51	.596
Sport	3.20	.659	2.79	.610
Strength	2.76	.576	2.74	.539
Condition	3.16	.662	2.99	.593

Correlation Analyses

Pearson correlations were used to assess the bivariate relationships between the perceived motivational climate subscales, perceived autonomy support, and the PSPP subscales. Table 9 contains the correlations calculated on the females' data and Table 10 shows the correlations for the males' data. For both males and females, significant positive correlations were found between perceived mastery climate and perceived autonomy support. In contrast, significant negative relationships were demonstrated between the perceived performance climate and perceived autonomy support variables for males and females. Significant negative relationships were also found between the perceived performance and mastery subscales for males and females.

Table 9 also reveals that for females the physical self-perception subscales were all significantly correlated with one another. In addition, perceptions of a mastery climate were positively related to conditioning competence (r = .148), body attractiveness (r = .135), and physical self-worth (r = .264). In contrast, perceptions of a performance climate were negatively related to physical self-worth (r = -.170). Finally, perceived autonomy support was positively related to conditioning (r = .152) and physical self-worth (r = .275).

Table 9

Correlations Among the Perceived Motivational Climate Subscales, Perceived Autonomy Support, and the PSPP Subscales (Females)

Variable	1	2	3	4	5	6	7	8
1. Mastery	-							
2. Performance	-.515**	-						
3. Autonomy	.592**	-.500**	-					
4. Sport	-.117	.032	.114	-				
5. Strength	.108	-.012	.119	.463**	-			
6. Condition	.148*	-.029	.152*	.499**	.463**	-		
7. Body	.135*	-.021	.125	.316**	.205**	.491**	-	
8. PSW	.264**	-.170*	.275**	.538**	.436**	.615**	.615**	-

Note: **Correlation is significant at the $p < .01$ (2-tailed), *Correlation is significant at the $p < 0.05$ level (2-tailed).

Similarly for males, Table 10 reveals significant positive correlations among all four of the physical self-perceptions subscales. However, there were no statistically significant correlations between the perceived motivational climate variables and the physical self-perceptions subscales, or between perceived autonomy support and the PSPP subscales.

Table 10

Correlations Among the Perceived Motivational Climate Subscales, Perceived Autonomy Support and the PSPP Subscales (Males)

Variable	1	2	3	4	5	6	7
1.Mastery	-						
2.Performance	-.302**	-					
3.Autonomy	.259**	-.291**	-				
4.Sport	.003	.079	.009	-			
5.Strength	-.044	.028	.023	.175*	-		
6.Condition	-.018	.057	.038	.394**	.346**	-	
7. PSW	-.044	-.044	.133	.297**	.494**	.599**	-

Note: **Correlation is significant at the $p < .01$ (2-tailed), *Correlation is significant at the $p < .05$ level (2-tailed).

Multiple Regression Analyses

Multiple regression analyses were utilized to address the primary purpose of this study, to examine how the perceived motivational climates and perceived autonomy support are related to physical self-perceptions. For each of the first nine analyses, perceived mastery and performance motivational climates, and perceived autonomy support were the independent variables. In the first two regression analyses, the dependent variable was physical self-worth. The results of the analyses for females revealed that only the autonomy support variable was significant in explaining physical self-worth, $p < .05$ (see Table 11). The standardized regression slope indicates that a one SD increase in perceived autonomy support is associated with a .183 SD increase in physical self-worth. The regression analyses of the males' data revealed that the model was not significant ($p > .05$), and none of the independent variables were significantly related to physical self-worth (see Table 12). However, it should be noted that perceived autonomy support approached significance ($p < .062$).

Table 11

Multiple Regression Analyses of Physical Self-Worth on the Perceived Motivational Climate Subscales and Perceived Autonomy Support (Females)

Variables	Beta	t	p
	$F(3, 214) = 7.171$	$p < .05$; $R^2 = .091$	
Mastery	.157	1.843	.067
Autonomy	.183	2.174	.031
Performance	.003	.032	.974

Table 12

Multiple Regression Analyses of Physical Self-Worth on the Perceived Motivational Climate Variables and Perceived Autonomy Support (Males)

Variables	Beta	t	P
	$F(3, 176) = 1.508$	$p > .05$; $R^2 = .025$	
Mastery	-.091	-1.146	.253
Autonomy	.149	1.875	.062
Performance	-.028	-.355	.723

For the next two multiple regression analyses, sport competence was the dependent variable. The results for the females indicated that, together, the independent variables failed to explain a significant portion of the variance in sport competence, individually or in combination. Only the perceived performance climate subscale

approached significance ($p < .06$). The results for the males were similar, finding no significance with the overall F-test for the model or the individual regressors.

In the next set of two multiple regression analyses, conditioning was the dependent variable. Results for the females and males data indicate that the independent variables did not explain a significant amount of the variance in conditioning competence ($p > .05$). For both males and females, none of the independent variables contributed significantly to the explanation of conditioning competence on its own. Further multiple regression analyses employed strength as the dependent variable. The results for both females and males revealed that none of the overall models were significant ($p > .05$) in explaining perceptions of strength, and again none of the individual regressors were significant. Only one analysis (for females) was done on the data from the body attractiveness scale, because the principal axis analysis revealed that the body attractiveness and physical self-worth subscales for males combined to form one subscale. Once again the females' data revealed a non-significant model and none of the independent variables were found to be significant in explaining body attractiveness

Finally, two multiple regression analyses were used to assess whether: (1) the four PSPP subscales were significant predictors of physical self-worth in females, and (2) the three PSPP subscales were significant predictors of physical self-worth in males. For the females' data, all four of the subscales were significant predictors of physical self-worth (see Table 13). The regression slopes were indicated that (1) 1 SD increase in sport competence was related to a .228 SD increase in physical self-worth; (2) 1 SD increase in strength was related to a .137 SD increase in physical self-worth; (3) 1 SD increase in conditioning is related to a .243 SD increase in physical self-worth, and; (4) a 1 SD

increase in body attractiveness is associated with a .396 SD increase in physical self-worth.

Table 13

Multiple Regression Analyses of Physical Self-Worth on the PSPP Subdomains (Females)

PSPP Subdomains	Beta	t	p
	$F(4, 213) = 72.156$	$p < .01$; $R^2 = .567$	
Sport Competence	.228	4.204	.001
Strength	.137	2.585	.010
Conditioning	.243	4.114	.001
Body Attractiveness	.396	7.675	.001

For the males, only two of the three subscales, strength and conditioning, were significant predictors of physical self-worth (see Table 14). The slopes indicate that a 1 SD increase in strength was associated with a .323 SD increase in physical self-worth, while a 1 SD increase in conditioning is associated with a .464 SD increase in physical self-worth. Sport competence was not a significant predictor of physical self worth for the men.

Table 14

Multiple Regression Analyses of Physical Self-Worth on the PSPP Subdomains (Males)

PSPP Subdomains	Beta	t	p
	$F(3, 176) = 48.942$	$p < .001$; $R^2 = .446$	
Sport Competence	.057	.947	.345
Strength	.323	5.447	.001
Conditioning	.464	7.298	.001

Chapter 5

Discussion

The primary purpose of this study was to examine the relationship between the perceived mastery and performance climates, perceived autonomy support, and physical self-perceptions in university and college students enrolled in physical activity classes. Each of these variables has been proposed to be important in understanding the motivational and learning environment (Ames, 1992a; Nicholls, 1984), but they had yet to be examined together in physical education contexts, or in conjunction with physical self-perceptions when viewed from a multidimensional perspective.

Discussion of Psychometric Analysis

Although measurement analyses and instrument validation were not primary purposes here, a number of statistical analyses were used to examine psychometric properties of the instruments utilized for this study and are worthy of commentary. The LCQ had not been validated in a physical activity context, and so exploratory factor analysis was conducted to examine the factor structure and composition of this instrument. Similarly, the PSPP was investigated using exploratory factor analysis, as participants used in this study may have differed from the participants used in previous validations of this instrument. Finally, some minor modifications were made to the PMCSQ, and consequently, exploratory factor analysis was also used to test the factorial validity of this scale.

Discussion of Psychometric Analysis of the Learning Climate Questionnaire (LCQ). Williams and Deci (1996) have found the LCQ to result in a one-factor solution and all factor loadings to be 0.5 and higher. However, the context of the climate may be

an important determinant of the merit of the LCQ. Most research has employed the LCQ for assessment in classroom settings. This study is one of the first to employ the LCQ as a measure of perceived autonomy support within physical activity settings. The reliability of the LCQ in the present study was $\alpha = .93$ for men and $\alpha = .96$ for women. The factor loadings on the LCQ were quite high for women ranging between .707 and .863 (not including item 13 which loaded quite low at .413) while those for men (after the deletion of item 13) ranged between .534 and .863.

Item 13 reads, "I don't feel very good about how my instructor talked to me" and is unique in its negative wording. The remaining fourteen items on this scale are positively worded in their descriptions. For example, item 9 is, "My instructor answered my questions fully and carefully". Perhaps some of the participants, especially males evidently, perceived item 13 to be positively phrased in accordance with the other items, and therefore, responded on the Likert scale in a manner that would reflect a positively worded item. The additional fact that this item is ordered deep in the instrument may have also encouraged some generalization from the format of the previous twelve items. At any rate, for males, this item was removed from the LCQ due to its very low loading onto the single factor solution.

The high internal consistency and factor structure of the LCQ support the appropriateness of its use for the present study. These findings address the concerns of the third limitation discussed in the introduction, and provide strong initial support for the LCQ as applicable for use in physical activity settings.

Discussion of Psychometric Analysis of the Physical Self-Perception Profile (PSPP). The literature reveals inconsistency in terms of how the PSPP has been factor

analyzed in previous research. In their initial work on the development of the PSPP, Fox and Corbin (1989) used both exploratory and confirmatory factor analyses to validate their instrument. Males and females were separated for both analyses. In the exploratory factor analysis the four physical self-perception subscales were analyzed together without the physical self-worth subscale (Fox & Corbin, 1989). This procedure revealed a strong four-factor structure for both the males' and females' data. In their confirmatory factor analysis, again only the four subscales were tested. They found the physical self-worth subscale was related to each of these four subscales and the global construct of self-esteem through a series of correlation analyses. In contrast, Sonstroem et al. (1992) used exploratory factor analysis on the four subdomains and physical self-worth subscale together. When all 30 items were analyzed in this manner, physical self-worth and body attractiveness were found to share a large amount of variance indicating that physical self-worth may be a partial mediator of relationships between body attractiveness and self-esteem (Sonstroem et al., 1992). For females, all twelve items from the physical self-worth and body attractiveness subscales loaded on a single factor instead of the intended two. Eleven of the twelve items from the physical self-worth and body attractiveness scales loaded on a single factor for the males and no factor included the six items hypothesized for that subscale. Sonstroem et al. (1992) found greater scale overlap in the results for males than for females. This finding is consistent with that of the present study where the body attractiveness and physical self-worth subscales collapsed into one factor for the males' data, with eight of the twelve items from these two subscales loading onto one factor. One important difference is that Sonstroem et al. (1992) used a population of adults (31 to 66 years) in an exercise setting while the present

investigation focused on a younger population of university and college students in a physical activity instruction context. Nevertheless, these results are strikingly parallel.

In a later study, Sonstroem et al. (1994) analyzed the measurement properties of the PSPP by means of confirmatory factor analysis (CFA). The previous CFA by Fox and Corbin (1989) did not include the physical self-worth subscale meanwhile, the Sonstroem et al. (1992) study identified a significant amount of overlap between physical self-worth and body attractiveness through EFA and interfactor correlations (r = .759). Sonstroem et al. (1994) investigated the factorial validity of the PSPP (including physical self-worth) with female aerobic dancers with a mean age of 38.4 years (SD = 16.2) using CFA. Again a large correlation between physical self-worth and body attractiveness were found (r = .85). Thus, the overlap of physical self-worth and body attractiveness remains a concern with at least five studies (Fox & Corbin, 1989; Kowalski et al., 2001; Hayes et al., 1999; Sonstroem et al., 1992; Sonstroem et al., 1994) detecting the large correlation between these two subscales, ranging from r = .71 to .85.

Among those reasons why the physical self-worth and body attractiveness subscales may be overlapping, by Sonstroem et al. (1994) suggested that people equate physical self-worth with body attractiveness and vice versa. Therefore, there may be a need to either change the wording of the items embedded in these two subscales to more clearly differentiate between them or collapse them into one subscale. As they presently exist, the results of several studies suggest that physical self-worth and body attractiveness are perceived very similarly. Furthermore, both males and females have demonstrated this tendency (Sonstroem et al., 1992; Sonstroem et al., 1994).

In this study, exploratory factor analysis has substantially changed the variables measured by the PSPP through the removal of items and collapsing of subscales. Therefore, the results of analyses employing this re-configured PSPP and other variables should be viewed with caution. This is especially true when making comparisons to previous research and when viewing the results of males in the present study.

Discussion of Psychometric Analysis of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ). The findings from the physical activity class data from the present study were congruent with exploratory factor analyses done in the past (Causgrove Dunn, 2000; Seifriz et al., 1992). However, in the present study two items were removed, ultimately changing the factor structure of the scale. This modification of the items could have altered the results, making it difficult to compare them directly to those of other studies. However, it is encouraging that past modifications of the PMCSQ have resulted in similar findings to the original PMCSQ (Causgrove Dunn, 2000) suggesting that it is resilient to such alterations. Using exploratory principal components analysis, Causgrove Dunn (2000) found two important factors after examining the scree plot. These two factors portrayed excellent simple structure with all twenty-one items loading on either perceived mastery or perceived performance, as intended. These two factors in the Causgrove Dunn (2000) study accounted for 37.60% of the variance, similar to the 41.94% of the variance accounted for by the two factors in the present study, where two items were removed from the performance factor. All in all, the continued development and judicial use of the PMCSQ was supported in the present study.

Relationships Between Perceived Motivational Climates and Perceived Autonomy Support

In addressing the primary purpose of this study, correlation and multiple regression analyses were used to examine the relationships between the perceived motivational climate variables and perceived autonomy support. The relationships found between the motivational climate variables (mastery, performance, and autonomy support) in this study were consistent with those predicted by the achievement goal theory and self-determination theory frameworks. Perceptions of a mastery-inducing climate were positively related to perceptions of autonomy support as evidenced through significant positive correlation between these two variables for both sexes. In comparison, perceptions of a performance-inducing climate were negatively correlated with perceptions of autonomy support for both males and females. Furthermore, the perceived performance and perceived mastery variables were negatively correlated with one another, again for both sexes.

The negative correlation between the mastery and performance variables has been noted in the literature (Causgrove Dunn, 2000; Walling et al., 1993). Walling et al. (1993) investigated the validity and reliability of the PMCSQ and found that there was a low negative interfactor correlation ($r = -.26$) between the mastery and performance climate scales. Correspondingly, Causgrove Dunn (2000) found a low negative correlation between the mastery and performance variables with a correlation of $r = -.12$ ($p = .16$). These findings support the negative correlation found between perceived mastery and perceived performance found in this study. Considering the stronger, but parallel correlation in the present study, a climate was unlikely to be perceived as both

mastery and performance inducing by any given individual. However, this certainly does not exclude the possibility that any given climate (class) was perceived very differently by different individuals.

Connections between perceptions of a mastery climate and perceptions of autonomy have been suggested by the literature (Ames, 1992a; Brunel, 1999; Fox, 1997; Ntoumanis & Biddle, 1999a). Therefore, a significant positive relationship between perceived mastery climates and perceived autonomy support was expected and, indeed, was found for both male and female participants. Ames' (1992a) adaptation of the TARGET (Epstein, 1989) structure used to promote mastery climates, includes the strategy of "Authority" which allows students to make their own decisions and choices and provides students with a sense of volition. Authority possesses qualities that are conceptually akin to perceptions of autonomy for students. Vallerand et al. (1986) and Ntoumanis and Biddle (1999a) connected the allowance of choice with the degree to which students perceive the motivational climate to be mastery inducing. They found perceptions of choice were positively associated with perceptions of mastery climates. Fox (1997) suggested that mastery and autonomy support may be just as important as perceived ability in determining self-esteem. Brunel (1999) found students who perceived their class climate as emphasizing mastery were more likely to feel self-determined. In relation to previous literature this study further supports the contention that perceptions of a mastery-inducing climate are positively associated with perceptions of autonomy support.

Conversely, perceptions of a performance climate were hypothesized to be negatively related to perceived autonomy support. Kowal and Fortier (2000) found this

to be true among adults (18-64 years). Their finding is consistent with the negative relationship found between perceived performance climates and perceived autonomy support in this study. Thus, when a climate is perceived to be performance inducing (i.e., emphasizing, equating success with ability, and focused on being better than others), it seems that there is not a perception that learner autonomy is supported by others in that setting.

Having confirmed the predicted relationship between these variables it is reasonable to suggest that different students may have perceived mastery climates, performance climates, and varying degrees of autonomy support within the same physical activity classes at GMCC and U of A. In line with achievement goal theory, each student would come into the PAC class with their own goals and experiences that may or may not have been influenced by the behavior, feedback, rewards, and other cues provided by the teacher and peers, in the same manner or to the same extent.

Physical Self-Perceptions

Relationships with Perceived Motivational Climates and Perceived Autonomy Support. Another primary purpose of this study was to investigate the relationships between physical self-perceptions and perceived motivational climate variables and perceived autonomy support. The significant correlations in the females' data between the motivational climate variables and physical self-perception subscales revealed that perceptions of competence in conditioning and physical self-worth were positively related to perceptions of a mastery climate and perceptions of autonomy support. Body attractiveness was also positively correlated with perceptions of a mastery climate, whereas physical self-worth was negatively correlated with perceptions of a performance

climate. These relationships were as hypothesized, and are comparable to relationships found in the literature.

Several studies have suggested that perceived competence is associated with feelings of autonomy within a physical education context (Goudas et al., 1994; Goudas et al., 1995a; Goudas et al., 1995b). Goudas et al. (1995a) demonstrated that female students (12-13 years old) in track and field classes perceived as supportive of autonomy, were more likely to feel competent, task oriented and intrinsically motivated than females in a class where most of the decisions were made by the teacher. In a university context, Goudas et al. (1995b) found a connection between perceptions of autonomy at the start of gymnastics courses and higher perceptions of competence, this finding was not duplicated here. In addition, there appeared to be no significant relationships between any of the physical self-perception scales and perceptions of motivational climates or autonomy support among males.

Regression analyses were completed to further determine and explain the relationship between the predictor variables of perceived motivational climates and autonomy support with each of the subscales of the PSPP. Of these nine analyses only one yielded significant results, that being the relationship of perceived autonomy support to physical self-worth (PSW) among females. This same relationship approached statistical significance among males. However, overall, the correlational results indicated that there were close relationships among the variables.

Internal Relationships of Subscales. The PSPP is based on a hierarchical model of perceptions of self-esteem and self-worth. Previously in the literature, this type of model was found to fit females better than males (Fox & Corbin, 1989). A confirmatory

factor analysis on female aerobic dancers (Sonstroem, 1998; Sonstroem et al., 1994) showed that all items loaded significantly on hypothesized factors with no cross-loadings. However, not all research supports this model. In this study, the subscales of the PSPP and the relationships among these and other variables was analyzed. The positive correlations relating perceptions of a mastery climate and autonomy support to the PSW subscale have been discussed. Likewise the negative relationship between perceived performance climates and PSW has been described. Evidence concerning the relationships among the PSPP subscales correlational analyses indicated that the various subscales of the PSPP were significantly related to each other and to the more general PSW subscale. This was true for both genders, however the body attractiveness and PSW subscales have been collapsed for males following factor analysis. Nevertheless, the correlational patterns supported the hierarchical structure upon which the PSPP is based. In most cases, the correlations were stronger between the subdomains and PSW than among the subdomains. The exceptions to this were among males, where conditioning correlated more highly with sport competence than PSW, and for females, where conditioning correlated more highly with strength that with PSW.

The literature has suggested and maintained that the more specific subscales of the physical self-perception profile are good predictors of PSW (Fox & Corbin, 1989; Hayes et al., 1999; Sonstroem et al., 1992; Whitehead, 1995). Multiple regression analyses were used to assess whether the four PSPP subdomains were significant predictors of PSW in females, and if the three PSPP subdomains were significant predictors of PSW in males. In the females' data, all four of the subscales were significant predictors of PSW (see Table 13). This is similar to the findings Sonstroem et

al. (1994), where PSW was related to all subdomains in a sample of adult, female, aerobic dancers.

In the males' sample only two of the three subscales, strength and conditioning, were significant predictors of PSW (see Table 14). Sport competence was not a significant predictor of PSW for the men. Meanwhile, the significant correlation between these sport competence and PSW suggests that part of the contribution of sport competence to explain variance in PSW is shared by the other two variables. Therefore, the portion of variance that is "unique" to sport competence is not significant. In other words, sport competence, strength, and conditioning are all correlated with one another and PSW. In a regression equation, the correlations between variables are partialled out and the remaining relationship is deemed significant or non-significant. The relationship between sport competence and PSW was non-significant in the regression analysis. One alternative explanation is that the after psychometric analysis the sport competence subscale is now composed of three items as opposed to the intended six items. The changes to this subscale and the PSW subscale (from six items to three items) may have altered the constructs measured and affected the results of the regression analysis.

Reflections on the Findings

It is evident that there is a relationship between perceived class climate and perceived autonomy support for males and females. Students in physical activity instruction courses reported that their autonomy was encouraged when the class climate was perceived as reflecting a mastery rather than a performance orientation. This could be an important finding when one considers that the goals of post secondary education purport to foster independent judgement, critical thinking, communication and decision

making skills (Fraser, 2001). It can be viewed as encouraging that in activity courses where students feel their role in decision making is supported, the perceived motivational climate is considered to accommodate the diversity that such autonomy might yield. Thus, the encouragement of autonomy was perceived to have co-existed with mastery climates.

The relationship of these variables to how people perceive themselves physically was not so clear. Perceived autonomy support has been previously linked to elevated perceptions of self-esteem, self-worth, competence in elementary school students (Ryan & Grolnick, 1986), increased performance in undergraduate organic chemistry classes (Black & Deci, 2000), improved perceptions of competence and interest/enjoyment in university students (Black & Deci, 2000; Williams & Deci, 1996), and higher autonomous motivation in elementary school students and university students (Grolnick & Ryan, 1987; Williams & Deci, 1996). Perceptions of autonomy support from instructors are important for students encompassing a wide age range and may be instrumental in successful learning and perceptions of the self.

This hypothesized relationship was supported in this study, but only for females. In fact, females' data indicated that both perceived mastery climates and perceived autonomy support were positively associated with higher perceptions of PSW (and physical conditioning). In addition, a perceived mastery climate is also associated positively with body attractiveness. These relationships are important as the concomitant literature has suggested that improved perceptions of competence and appearance and improved sense of autonomy and control over the body are three mechanisms that may have a role in changing self-perceptions and ultimately changing self-esteem (Fox, 2000).

The present study indicates that for women, a perceived mastery and/or autonomy support climate is associated positively with enhanced physical self-perceptions. Once more, the benefits of these relationships may indicate that educators in physical activity classes should attempt to produce and foster perceived mastery climates and/or autonomy support in efforts to enable positive perceptions of the physical self. Fox (2000) suggests that women may have the most to benefit from changes in PSW and self-esteem as women tend to have lower PSW and self-esteem. Women also tend to have lower participation rates in physical activity (Crocker et al., 2000).

The relationships observed for females between perceived autonomy support, mastery climate, and physical self-perceptions were not observed in males. It could be, that for males of this age, physical self-worth simply is not associated with these situational factors. Another explanation for this is that the males' data has undergone more psychometric alteration than the females' data especially on the PSPP, and to a lesser extent, on the LCQ.

It has been recommended that teachers, instructors, and study group leaders advocate autonomy behaviors within their respective domains of learning and physicality, as a means of promoting positive self-perceptions in terms of both academic and physical competence (Black & Deci, 2000; Grolnick & Ryan, 1987; Williams & Deci, 1996). The evidence from this study supports a relationship between perceived autonomy support and physical self-worth among females. Fox's (1997) suggestion that autonomy could be an extra component of the self-perception hierarchies may have merit, but there was not sufficient evidence here to make the same statement concerning males.

Suggestions for Future Directions

As a result of concluding this study the following suggestions are forthcoming. The use of the construct of perceived autonomy support in physical activity is promising. Subsequent work involving physical self-perceptions and autonomy is needed to determine if, and where, autonomy fits into the hierarchical model of self-concept (Fox, 1997). Autonomy has been shown to be related to perceptions of competence and intrinsic motivation within physical education settings. In fact, positive perceptions of competence have been found to be enhanced in the presence of perceived autonomy and together, have fostered increased levels of intrinsic motivation (Goudas et al., 1994; Goudas et al., 1995a; Goudas et al., 1995b).

For future research, some of the findings involving instrumentation used in this study are important. There appear to be some potential limitations with the use of the PMCSQ in educational settings. Harwood, Hardy, and Swain (2000) suggest that it cannot be assumed that ego and task involved goals mean the same thing in education and sport contexts. They identify how different concepts such as learning, understanding, improvement, mastery and performance may be construed differently in different domains. For example 'performance' within a physical education/physical activity class versus an athletic competition may be defined and perceived quite differently. In addition, Ntoumanis and Biddle (1999b) suggest that there is more variability in physical ability in physical activity instruction compared to sport and therefore physical education settings actually tend to have more varied levels of competence within them. Ntoumanis and Biddle (1999b) define physical education as participation in sport where interpersonal competence, improvement and effort are emphasized and are often reflected in the formal evaluation system. In contrast, there is a higher sense of pressure in senior

level sport (Ntoumanis & Biddle, 1999b). The items within the PMCSQ may need to be restructured to reflect the context of physical education (at the elementary and secondary level) and physical activity (at the university and college level). The exploratory factor analyses conducted on the PMCSQ in this study revealed that two items were problematic and subsequently deleted. One of these items was, "Students are punished for mistakes". There are also two other items on this instrument that refer to the consequences of making mistakes. Perhaps making errors is accepted as a part of learning in physical education with consequences that are minimal. In contrast, committing a critical mistake during competitive sport performance may warrant more concern, since it may result in defeat. Seifriz et al. (1992) noted that tension increased significantly for male basketball players in a performance climate because of the repercussions of mistakes. Also, the role of a teacher and coach are much different within their respective motivational climates. Such differences in environments may reduce the psychometric value of the modified items.

Other modifications made to the PMSCQ prior to data collection were a means of allowing the participants to individually interpret the items. The word "instructor" was removed from all items in an initial attempt to better accommodate the motivational climate more inclusively than the instructor alone. Ntoumanis and Biddle (1999a) argued that peer interaction and peer influence on the creation of the motivational climate is important for future study. Peer acceptance has been shown to be related to high perceived and actual competence (Ntoumanis & Biddle, 1999a). The motivational climate in a physical activity setting should consider the potential influence of peers from

preadolescence onward. Whether peers should be specified in items or merely accommodated within general terminology is yet to be determined.

The original PSPP, used in this study, has been assessed using confirmatory factor analysis (CFA) in a few studies. The methods used for CFA have been inconsistent in their implementation and methodology. In their initial development of the PSPP, Fox and Corbin (1989) found this scale to be reliable, sensitive and stable across three independent samples of college students. Confirmatory factor analysis on the four subscales also indicated that their results were normally distributed, indicating an absence of systematic error, and that the four subscales adequately described the subscale items. Similarly, Sonstroem et al. (1994) demonstrated good fit of the PSPP data to the exercise self- esteem model used in their study. The CFA on all subscales including PSW and global self-esteem, revealed all items loaded on their intended factor. However, both of these studies also measured global self-esteem, the uppermost level of the physical self-perception hierarchy model, which was not assessed in the present study. There have been discrepancies in how to factor analyze the PSPP. Some consider that the four subscales and physical self-worth subscale should be analyzed together (Crocker et al., 2000; Sonstroem et al., 1992; Sonstroem et al., 1994), while others perceive that the four subscales should be factor analyzed separately from the PSW subscale and global self-esteem (Fox & Corbin, 1989; Whitehead, 1995). In the present study, the four subscales and physical self-worth were factor analyzed together. There are valid arguments for analyzing the PSPP in these different ways. For example, depending upon the research question that is being addressed, one may want to include PSW into the factor analysis or not. In addition, if the intent of the research is to address the psychometric properties of

the PSPP then arguments can be made for including the PSW into the analyses. In the past researchers (Fox & Corbin, 1989) have argued that PSW is a hierarchical construct that is highly correlated with the subdomains and therefore was not put into the factor analysis. However, future research should reach a consensus on the method employed to ensure that more accurate comparisons between studies can be made on the factor structure of the PSPP.

There is a need to replicate the present study with a variety of participants to further explore the relationships between the perceived motivational climate, perceived autonomy support and physical self-perceptions. There were some problems with how the scales were responded to by the males in this study, particularly on the PSPP and the LCQ. It is important to determine if these results are consistent with other samples of males or an artifact of the particular participants of this study.

Replication would also be appropriate at the secondary school level in order to address reasons why students drop out of physical education when it is no longer a required course. The secondary level is appropriate to investigate as the literature has suggested that adolescence is an important time in forming perceptions of the motivational climate and physical self-perceptions (Fox, 1992; Ntoumanis & Biddle, 1999a). Perceptions of autonomy support have been demonstrated by Vallerand et al. (1997) as related to behavioral intentions to stay in secondary school. A longitudinal study would provide more information on the physical education participation patterns with the study beginning in the first year of high school when physical education is mandatory and continuing until after students have decided whether to continue in physical education. This study could explore whether or not motivational climates or

autonomy support might be among the reasons for discontinuing participation in physical education.

Other considerations should be made when investigating the relationships between the motivational climate, autonomy support and physical self-perceptions. The time frame in which the situational variables are assessed during the course of the class is important. For example, do perceptions change over the course of a class, and if so when would be the best time to assess these perceptions? Data collection for this study was conducted in the middle of the fall semester at both the University of Alberta and Grant Mac Ewan Community College. Perhaps different results would have been found had the data been collected at the end of the term when all of the performance testing would have been completed. One recommendation for future studies involving physical activity classes would be to administer questionnaires at different times throughout the term to different students and test for meaningful differences across time points. Such an approach would also reveal how long it takes students to come to a determination about the learning climate and help to identify what events (evaluations, instruction, etc.) mold that determination.

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APPENDIX A

Programs of Study

Programs of Study

Program	Number of Participants	Percentage Per Category
BPE	174	44.4
BPE/BED	72	18.4
Education	83	21.2
Arts	18	4.6
Native Studies/Human	1	0.3
Ecology	1	0.3
Occupational Therapy	3	0.8
Forestry	1	0.3
Nursing	1	0.3
Business	3	0.8
Music	5	1.3
Physiotherapy	1	0.3
Active Living	1	0.3
Engineering	1	0.3
Science	2	0.5
Political Science	1	0.3
General Studies	7	1.8
Management	1	0.3
Visual Communications	9	2.3
Microcomputers	1	0.3
Unclassified	2	0.5
BA/BED	1	0.3
Design	1	0.3
MCSP	1	0.3
Rehab Practitioner	1	0.3
Asia Pacific Mgmt	1	0.3
Total	392	
Missing	6	

Note. BPE = bachelor of physical education, BED = bachelor of education, BA = bachelor of arts, MCPS = management studies program.

APPENDIX B

Letter to Instructor

Letter to Instructor

Dear Instructor,

My name is Katie Frauts and I am currently a masters student in the Faculty of Physical Education and Recreation at the University of Alberta. I am studying motivational climates in university physical activity classes to see how they affect and/or explain physical self-perceptions. The motivational climate includes social agents in the learning environment like the teacher, peers, and friends. Physical self-perceptions are important as they are related to self-esteem, ability, sport, physical education and physical activity involvement (Fox & Corbin, 1989). Within a physical domain little is known about how individuals interpret aspects of their physical selves and how the physical self mediates the effects of behavior on self esteem (Fox, 1997). Self-esteem is a significant part of physical self-perceptions, and enhancement of self-esteem should be considered in a learning environment.

I would like to administer three questionnaires to your students. Two of these questionnaires ask questions about the motivational climate. There are 15 statements to respond to on the Learning Climate questionnaire (LCQ) and 21 statements to respond to on the Perceived Motivational Climate in Sport questionnaire (PMCSQ). The third questionnaire is the Physical Self-Perception Profile (PSPP) (Fox & Corbin, 1989) which has 30 statements. The total time for the students to complete these three questionnaires will be no longer than 20 minutes. The data collection will likely take place before or after classes to prevent disruption.

The students will fill out a consent form and will be made aware that they can withdraw from the study at any point without consequence. All of the information provided by the students will only be accessible to my co-investigators (Dr. Karen Fox, Dr. Janice Causgrove-Dunn) and myself. The students will be informed that their names will not appear on any of the questionnaires or the demographic sheet and therefore their identity will be concealed.

Thank you for considering this project. Your cooperation would greatly benefit my own research and the research on learning environments and physical self-perceptions in university physical education classes.

Sincerely,

Katie Frauts
492-5503

Dr. Karen Fox
492-7173

Dr. Janice Causgrove-Dunn
492-0580

APPENDIX C

Letter to Participants

Consent Form

Letter to Participants

Dear Student,

My name is Katie Frauts and I am currently a masters student in the Faculty of Physical Education and Recreation at the University of Alberta. I am studying the learning environments in university physical activity classes to see how they affect and/or explain physical self-perceptions. There are two main purposes of this study. The first purpose is to learn more about how learning environments affect and/or explain the physical self-perceptions of university students. The second purpose is to investigate if there are differences between male and female students in their perceptions of the learning climate and their physical selves.

The learning environment is also called the motivational climate. The motivational climate includes social agents in the learning environment like the instructor, peers and friends. By determining how the motivational climate explains physical self-perceptions, we can make instructors aware of the needs of university students. This study will also allow us to examine what social agents in the environment are influencing the students.

Your involvement in this study will require you to fill out three questionnaires. The questionnaires will be completed before or after class. The total time to complete all three questionnaires will be no longer than 20 minutes. You may ask any questions of the investigator at any point during your participation.

Your participation and individual information and responses will be kept in complete confidence by the co-investigators (Dr.Karen Fox and Dr. Janice Causgrove-Dunn) and myself. To ensure confidentiality all results will be coded and stored in a locked filing cabinet to which only the investigators will have access. Normally, information is retained for a period of five years post publication, after which it will be destroyed. The risks associated with your participation are the disclosure of personal information, as you will be filling out three questionnaires and a short demographic sheet. Your name will not appear on any of the questionnaires or the demographic sheet. The results of the study may be used for further research, scholarly publications, and academic presentations. At no time will individual results be released. This study is separate from your PAC class and therefore your instructor will not have access to any data.

You may withdraw from this study at any time without consequence during the research process. In order to withdraw, all you must do is inform the investigator. Your information will be destroyed at your request.

If you have any concerns, feel free to contact myself at any time at the number below. If you would like to speak with someone who is not involved in the study, please call Dr. Debra Shogan, Associate Dean (Research and Graduate Studies), Faculty of Physical Education and Recreation, University of Alberta, at (780) 492-5910.

Please **read and sign** the following consent form to indicate your involvement. Thank you for your time and consideration.

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University of Alberta, Edmonton, AB.
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Dr. Karen Fox
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Consent Form

How the Motivational Climate Affects Physical Self-Perceptions

Principal Investigator:
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Purpose: The purpose of this study is to investigate students' perceptions of their learning environment in physical activity classes to see how this affects their physical self-perceptions. This study entails the completion of three questionnaires, two that reflect perceptions of the motivational climate and one that relates to physical self-perceptions.

Please Complete:

Do you understand that you have been asked to be in a research study?	**Yes**	**No**
Have you received and read a copy of the attached information sheet?	**Yes**	**No**
Do you understand the potential benefits and risks involved in taking part in this research study?	**Yes**	**No**
Have you had an opportunity to ask questions and discuss this study?	**Yes**	**No**
Do you understand that you may refuse to participate, or withdraw from this study at any time, without consequence, and that the information that you have provided will be withdrawn at your request?	**Yes**	**No**
Have you been informed that your identity will be kept confidential along with any information that you provide in this study?	**Yes**	**No**
Do you understand who will have access to your information?	**Yes**	**No**

This study was explained to me by _____
I agree to take part in this study.

_____ _____
Signature of Research Participant Date

_____
Name (please **print**)

I believe that the person signing this form understands this study and voluntarily agrees to participate.

_____ _____
Signature of Investigator Date

APPENDIX D

Demographic Information

Learning Climate Questionnaire

Modified Perceived Motivational Climate in Sport Questionnaire

The Physical Self-Perception Profile

DEMOGRAPHIC INFORMATION

Age:	Year of study:
Sex: Male Female	Program:

1) How many years have you participated in the activity taught in this PAC class? Please check one of the boxes below the appropriate option.

None	1-2	3-4	5-6	7-8	9-10	>10

2) How would you describe your involvement in this activity? Please check the box (s) that apply to you.

	Never participated before this class
	Have participated only in secondary school physical education
	Have participated on a recreational or intramural team
	Have participated on a city or club team
	Have participated on a college or university team

3) How would you classify your skill level in this activity? (please choose <u>ONE ONLY</u>)

Beginner	Intermediate	Advanced

<u>Learning Climate Questionnaire</u>

<u>Please use the following scale:</u>

1	2	3	4	5	6	7
not true			somewhat true			very true

1) I felt that my instructor provided me with choices and options.

1	2	3	4	5	6	7
not true			somewhat true			very true

2) I felt understood by my instructor.

1	2	3	4	5	6	7
not true			somewhat true			very true

3) I was able to be open with my instructor during class.

1	2	3	4	5	6	7
not true			somewhat true			very true

4) My instructor conveyed confidence in my ability to do well in the course.

1	2	3	4	5	6	7
not true			somewhat true			very true

5) I felt that my instructor accepted me.

1	2	3	4	5	6	7
not true			somewhat true			very true

6) My instructor made sure I really understood the goals of the course and what I need to do.

1	2	3	4	5	6	7
not true			somewhat true			very true

7) My instructor encouraged me to ask questions.

1	2	3	4	5	6	7
not true			somewhat true			very true

8) I feel a lot of trust in my instructor.

1	2	3	4	5	6	7
not true			somewhat true			very true

9) My instructor answered my questions fully and carefully.

1	2	3	4	5	6	7
not true			somewhat true			very true

10) My instructor listened to how I would like to do things.

1	2	3	4	5	6	7
not true			somewhat true			very true

11) My instructor handles people's emotions very well.

1	2	3	4	5	6	7
not true			somewhat true			very true

12) I feel that my instructor cares about me as a person.

1	2	3	4	5	6	7
not			somewhat			very
true			true			true

13) I don't feel very good about the way my instructor talked to me.

1	2	3	4	5	6	7
not			somewhat			very
true			true			true

14) My instructor tried to understand how I saw things before suggesting a new way to do things.

1	2	3	4	5	6	7
not			somewhat			very
true			true			true

15) I feel able to share my feelings with my instructor.

1	2	3	4	5	6	7
not			somewhat			very
true			true			true

Modified Perceived Motivational Climate in Sport Questionnaire

Please use the following scale:

1	2	3	4	5
strongly disagree				**strongly agree**

1) Students feel good when they do better than other classmates

1	2	3	4	5
strongly disagree				strongly agree

2) Students are punished for mistakes

1	2	3	4	5
strongly disagree				strongly agree

3) Students get criticized for making mistakes

1	2	3	4	5
strongly disagree				strongly agree

4) Doing better than other students is important

1	2	3	4	5
strongly disagree				strongly agree

5) Most of the attention goes to the "best students"

1	2	3	4	5
strongly disagree				strongly agree

6) Doing better than others is important

1	2	3	4	5
strongly disagree				strongly agree

7) Some students are favored

1	2	3	4	5
strongly disagree				strongly agree

8) Students are encouraged to do better than other students

1	2	3	4	5
strongly disagree				strongly agree

9) Everyone wishes they were the star student

1	2	3	4	5
strongly disagree				strongly agree

10) Only the best students "get noticed"

1	2	3	4	5
strongly disagree				strongly agree

11) Students are afraid to make mistakes

1	2	3	4	5
strongly disagree				strongly agree

12) Only a few students can be the "stars"

1	2	3	4	5
strongly disagree				strongly agree

13) Trying hard is rewarded

1	2	3	4	5
strongly disagree				strongly agree

14) The class is structured to focus on skill improvement

1	2	3	4	5
strongly disagree				strongly agree

15) Each student's improvement is important

1	2	3	4	5
strongly disagree				strongly agree

16) Students try hard to learn new skills

1	2	3	4	5
strongly disagree				strongly agree

17) The class is structured to enable us to try new skills

1	2	3	4	5
strongly disagree				strongly agree

18) Students like playing with and competing against good students

1	2	3	4	5
strongly disagree				strongly agree

19) All students in this class have an important role

1	2	3	4	5
strongly disagree				strongly agree

20) Everyone gets to try every position in every activity

1	2	3	4	5
strongly disagree				strongly agree

21) Students are encouraged to work on their weaknesses

1	2	3	4	5
strongly disagree				strongly agree

THE PHYSICAL SELF PERCEPTION PROFILE (PSPP)

WHAT AM I LIKE?

These statements allow people to describe themselves.
There are no right or wrong answers since people differ a lot.

First, decide which one of the two statements best describes you.

Then go to that side of the statement and check if it is just
"sort of true" or **"really true" FOR YOU.**

EXAMPLE:

Really True for me	Sort of True for me				Sort of True for Me	Really True for Me
☐	☐	**Some people are very competitive**	**BUT**	**Others are not quite so competitive**	☒	☐

REMEMBER to check only ONE of the four boxes

Really True for me	Sort of True for me				Sort of True for me	Really True for me
1. ☐	☐	**Some people feel that they are not very good when it comes to playing sports**	**BUT**	**Others feel that they are really good at just about every sport**	☐	☐
2. ☐	☐	**Some people are not very confident about their level of physical conditioning and fitness**	**BUT**	**Others always feel confident that they maintain excellent conditioning and fitness**	☐	☐
3. ☐	☐	**Some people feel that compared to most, they have an attractive body**	**BUT**	**Others feel that compared to most, their body is not quite so attractive**	☐	☐

4.	Some people feel that they are physically stronger than most people of their sex	BUT	Others feel that they lack physical strength compared to most others of their sex			
5.	Some people feel extremely proud of who they are and what they can do physically	BUT	Others are sometimes not quite so proud of who they are physically			
6.	Some people feel that they are among the best when it comes to athletic ability	BUT	Others feel that they are not among the most able when it comes to athletics			
7.	Some people make certain they take part in some form of regular vigorous physical activity	BUT	Others don't often manage to keep up regular vigorous physical exercise			
8.	Some people feel that they have difficulty maintaining an attractive body	BUT	Others feel that they are easily able to keep their bodies looking attractive			
9.	Some people feel that their muscles are much stronger than most others of their sex	BUT	Others feel that on the whole their muscles are not quite so strong as most others of their sex			
10.	Some people are sometimes not so happy with the way they are or what they can do physically	BUT	Others always feel happy about the kind of person they are physically			
11.	Some people are not quite so confident when it comes to taking part in sport activities	BUT	Others are among the most confident when its comes to taking part in sports activities			
12.	Some people do not usually have a high level of stamina and fitness	BUT	Others always maintain a high level of stamina and fitness			
13.	Some people feel embarrassed by their bodies when it comes to wearing few clothes	BUT	Others do not feel embarrassed by their bodies when it comes to wearing few clothes			
14.	When it comes to situations requiring strength some people are one of the first to step forward	BUT	When it come to situations requiring strength some people are one of the last to step forward			

15.	☐ ☐	When it comes to the physical side of themselves some people do not feel very confident	BUT	Others seem to have a real sense of confidence in the physical side of themselves	☐	☐
16.	☐ ☐	Some people feel that they are always one of the best when it comes to joining in sports activities	BUT	Others feel that they are not one of the best when it comes to joining in sports activities	☐	☐
17	☐ ☐	Some people tend to feel a little uneasy in fitness and exercise settings	BUT	Others feel confident and at ease at all times in fitness and exercise settings	☐	☐
18	☐ ☐	Some people feel that they are often admired because their physique or figure is considered attractive	BUT	Others rarely feel that they receive admiration for the way their body looks	☐	☐
19	☐ ☐	Some people tend to lack confidence when it comes to their physical strength	BUT	Others are extremely confident when it comes to their physical strength	☐	☐
20	☐ ☐	Some people always have a really positive feeling about the physical side of themselves	BUT	Others sometimes do not feel positive about the physical side of themselves	☐	☐
21	☐ ☐	Some people are sometimes a little slower than most when it comes to learning new skills in a sports situation	BUT	Others have always seemed to be among the quickest when it comes to learning new sports skills	☐	☐
22	☐ ☐	Some people feel extremely confident about their ability to maintain regular exercise and physical condition	BUT	Others don't feel quite so confident about their ability to maintain regular exercise and physical condition	☐	☐
23	☐ ☐	Some people feel that compared to most, their bodies do not look in the best of shape	BUT	Others feel that compared to most their bodies always look in excellent physical shape	☐	☐
24	☐ ☐	Some people feel that they are very strong and have well developed muscles compared to most people	BUT	Others feel that they are not so strong and their muscles are not very well developed	☐	☐

25	Some people wish that they could have more respect for their physical selves	BUT	Others always have great respect for their physical selves			
26	Given the chance, some people are always one of the first to join in sports activities	BUT	Other people sometimes hold back and are not usually among the first to join in sports			
27	Some people feel that compared to most they always maintain a high level of physical conditioning	BUT	Others feel that compared to most their level of physical conditioning is not usually so high			
28	Some people are extremely confident about the appearance of their body	BUT	Others are a little self-conscious about the appearance of their bodies			
29	Some people feel that they are not as good as most dealing with situations requiring physical strength	BUT	Others feel that they are among the best at dealings with situations which require physical strength			
30	Some people feel extremely satisfied with the kind of person they are physically	BUT	Others sometimes feel a little dissatisfied with their physical selves			

APPENDIX E

Means, Standard Deviations, and Ranges of the LCQ (Females)

Means, Standard Deviations, and Ranges of the LCQ (Males)

Means, Standard Deviations, and Ranges of the PMCSQ

Means, Standard Deviations, and Ranges of the PSPP (Females)

Means, Standard Deviations, and Ranges of the PSPP (Males)

Means, Standard Deviations, and Ranges of the Learning Climate Questionnaire (Females)

Items	M	SD	Range
LCQ 1	5.07	1.51	6
LCQ 2	5.40	1.38	6
LCQ 3	5.66	1.35	6
LCQ 4	5.33	1.50	6
LCQ 5	5.78	1.24	6
LCQ 6	5.58	1.36	6
LCQ 7	5.58	1.41	6
LCQ 8	5.50	1.39	6
LCQ 9	5.61	1.37	6
LCQ 10	4.89	1.55	6
LCQ 11	5.12	1.45	6
LCQ 12	5.33	1.36	6
LCQ 13	6.06	1.53	6
LCQ 14	4.85	1.40	6
LCQ 15	4.67	1.60	6

Means, Standard Deviations, and Ranges of the Learning Climate Questionnaire (Males)

Items	M	SD	Range
LCQ 1	5.37	1.22	6
LCQ 2	5.67	1.22	6
LCQ 3	5.90	1.19	6
LCQ 4	5.86	1.10	5
LCQ 5	6.10	1.05	6
LCQ 6	5.74	1.21	6
LCQ 7	5.61	1.24	5
LCQ 8	5.77	1.12	6
LCQ 9	5.73	1.05	5
LCQ 10	5.16	1.26	5
LCQ 11	5.40	1.25	6
LCQ 12	5.53	1.23	6
LCQ 14	4.88	1.35	6
LCQ 15	4.91	1.52	6

Means, Standard Deviations and Ranges of the Perceived Motivational Climate in Sport Questionnaire

Items	M	SD	Range
PMCSQ 3	2.09	1.06	4
PMCSQ 4	3.29	1.18	4
PMCSQ 5	2.65	1.22	4
PMCSQ 6	3.24	1.18	4
PMCSQ 7	2.93	1.26	4
PMCSQ 8	2.82	1.23	4
PMCSQ 9	3.20	1.26	4
PMCSQ 10	2.44	1.12	4
PMCSQ 11	2.61	1.23	4
PMCSQ 12	3.06	1.31	4
PMSCQ 13	3.77	1.15	4
PMCSQ 14	4.02	1.10	4
PMCSQ 15	4.05	1.08	4
PMCSQ 16	4.00	.860	4
PMCSQ 17	4.16	.880	4
PMCSQ 18	3.76	.920	4
PMCSQ 19	3.65	1.09	4
PMCSQ 20	4.04	1.01	4
PMCSQ 21	4.15	.900	4

Means, Standard Deviations and Ranges of the Physical Self-Perception Profile (Females)

Items	M	SD	Range
PSPP 1	2.79	.73	3
PSPP 3	2.59	.67	3
PSPP 4	2.94	.59	3
PSPP 5	3.01	.68	3
PSPP 6	2.67	.71	3
PSPP 7	3.24	.81	3
PSPP 8	2.42	.75	3
PSPP 9	2.87	.65	3
PSPP 10	2.67	.81	3
PSPP 11	2.82	.86	3
PSPP 12	2.86	.73	3
PSPP 13	2.49	.83	3
PSPP 14	2.62	.76	3
PSPP 15	2.78	.75	3
PSPP 16	2.62	.71	3
PSPP 17	3.01	.66	3
PSPP 18	2.56	.74	3
PSPP 19	2.70	.75	3
PSPP 20	2.76	.74	3
PSPP 21	2.77	.83	3
PSPP 22	3.01	.78	3
PSPP 23	2.50	.78	3
PSPP 24	2.71	.66	3
PSPP 26	3.06	.79	3
PSPP 27	2.84	.78	3
PSPP 29	2.61	.71	3
PSPP 30	2.71	.82	3

Means, Standard Deviations and Ranges of the Physical Self-Perception Profile (Males)

Items	M	SD	Range
PSPP 1	3.13	.78	3
PSPP 3	2.76	.71	3
PSPP 4	2.75	.74	3
PSPP 5	3.16	.72	3
PSPP 7	3.28	.76	3
PSPP 8	2.66	.79	3
PSPP 9	2.67	.70	3
PSPP 11	3.29	.75	3
PSPP 13	2.94	.84	3
PSPP 14	2.81	.77	3
PSPP 18	2.70	.74	3
PSPP 20	2.98	.74	3
PSPP 21	3.18	.83	3
PSPP 22	3.14	.83	3
PSPP 27	3.06	.77	3
PSPP 28	2.73	.83	3
PSPP 29	2.80	.74	3
PSPP 30	2.97	.79	3