# Effects of a Sport Education Intervention on Students' Motivational Responses in Physical Education

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# Effects of a Sport Education Intervention on Students' Motivational Responses in Physical Education

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This study looked at the influence of a Sport Education intervention program on students' motivational responses in a high school physical education setting. Two intact groups were assigned curricular interventions: the Sport Education group ($n$ = 25), which received eight 60-min lessons, and the comparison group ($n$ = 26), which received a traditional teaching approach to sport-based activity. Pre- and postintervention measures of student enjoyment, perceived effort, perceived competence, goal orientations, perceived motivational climate, and perceived autonomy were obtained for both groups. Repeated-measures ANOVAs showed significant increases in student enjoyment and perceived effort in the Sport Education group only. Hierarchical regression analyses revealed that increases in task-involving climate and perceived autonomy explained a significant amount of unique variance in the Sport Education students' postintervention enjoyment, perceived effort, and perceived competence responses. The results suggest that the Sport Education curriculum may increase perceptions of a task-involving climate and perceived autonomy, and in so doing, enhance the motivation of high school students toward physical education.

Key Words: curriculum programs, motivational climate, high school students

Motivation has been viewed as a key factor influencing student learning outcomes (Chen, 2001). From a cognitive perspective, Pintrich and Schunk (1996) have defined motivation as the process in which a goal-directed activity is instigated and sustained. In the educational domain, research on motivation is mainly concerned with how personal and environmental factors involved in the teaching/learning process energize and direct student learning and achievement (Chen, 2001). Whether students are motivated to persist in the learning behavior or not is highly dependent on their specific goals and cognitions, and on whether they perceive their experience as positive or not. A type of individual motivation that has been shown to be important in determining positive motivated behavior in physical education and sport is the students' level of intrinsic motivation (Mitchell, 1996). This

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concept has been defined as the degree to which one chooses to participate in an activity for its inherent pleasure rather than for any valued outcomes associated with it (Deci & Ryan, 1985). Deci and Ryan (1985) theorize that when students are intrinsically motivated, they show interest in an activity; they experience enjoyment and feelings of competence and control.

Research in sport (Pelletier, Fortier, Vallerand, et al., 1995) and physical education (Ntoumanis, 2001) has shown that intrinsic motivation is positively related to students feeling less bored, reporting greater self-effort, and being more intent on future participation in physical activity. As such, fostering tasks in physical education that increase student perceptions of optimal challenge, personal control, and self-competence will enhance intrinsic motivation and develop a number of positive adaptive student motivational responses (Deci & Ryan, 1985).

During the last two decades, researchers have employed achievement goal theory to explain student motivational responses to learning, such as enjoyment and effort (Nicholls, 1989). Those using this perspective are concerned with reasons for motivated behavior (Chen, 2001). Two primary achievement goals have been identified in student motivated behaviors. The first goal is to demonstrate superior ability relative to peers; it is called ego goal orientation. The other goal is to develop self-referenced competence or gain mastery of a task; it is labeled task goal orientation (Dweck & Leggett, 1988). Research in the physical education domain (Treasure & Roberts, 2001) has shown that the two goal orientations relate to different behavioral and affective student motivational responses, such as choice of task difficulty, satisfaction, and enjoyment. Students with a high task orientation use individual improvement and effort to define success. They choose challenging tasks and report higher levels of enjoyment. In contrast, students with a high ego orientation tend to avoid learning difficult tasks, which might jeopardize their normative conceptions of ability. They attribute success or failure to normative ability.

Achievement goal orientations are purported to explain student motivation at the individual level. At the situational level, achievement goal theorists (e.g., Ames, 1992) have suggested that students may percieve different instructional structures as fostering different achievement goals. Epstein (1989) coined the acronym TARGET to represent six structures of the achievement context which influence student motivation in the classroom: Task, Authority, Reward, Grouping, Evaluation, and Time. Ames contended that the way teachers operationalize these structures determines, to a great extent, children's motivational responses. For example, an instructional structure that offers task variety, involves students in the decision-making, promotes work in mixed-ability groups, and emphasizes self-referenced criteria for evaluation and recognition would promote a high task-involving motivational climate. In contrast, in an ego-involving climate the emphasis is on demonstrating superior performance and normative ability, with besting others being the primary indicator of success. In such a climate teachers dictate the tasks, student initiative is not encouraged, and rewards are based on peer comparison and normative success.

Consistent with research in the classroom settings (Ames & Archer, 1988), research in physical education has revealed high student satisfaction with engagement in learning when a task-involving motivational climate is perceived (Treasure, 1997). Other positive motivational outcomes associated with a task-involved climate include increases in student intrinsic motivation (Mitchell, 1996) and the

belief that effort leads to success (Solmon, 1996). In contrast, perceptions of an ego-involved climate have been found to relate to decreases in intrinsic motivation (Papaioannou, 1995) and the perception that the teacher favors high achievers (Treasure, 1997).

Although previous studies (Solmon, 1996; Treasure, 1997; Treasure & Roberts, 2001) have lent some support to Ames' call (1992) for a task-involved climate, most of them have been conducted with students of middle-school age (Solmon, 1996; Treasure & Roberts, 2001). To date, little research in this domain has been conducted with students of high school age as a target population. Considering recent findings (Xiang, Lee, & Shen, 2001) which show that as adolescents progress through high school they tend to become more ego-goal oriented, this population should be a priority for interventions of this type. Studies based on the manipulation of Epstein's (1989) TARGET dimensions for creating a task-involved climate have also tended to use non-PE-specific activities (e.g., Solmon, 1996), thus they lack generalization to other physical education settings. One physical education curriculum that has been designed to be used in sport-based activities, and has recently shown the potential to increase students' positive motivational responses to physical education, is the Sport Education model (Siedentop, 1994).

The Sport Education curriculum model was designed to provide positive motivational sport experiences for all students in physical education by simulating key contextual features of authentic sport (Siedentop, 1994). In addition to helping students improve their sport skills, sport education encourages them to fulfill other sport related roles such as referee, team coach, captain, and serving on a sports management board or as part of a duty team. Within the instructional structure of this curriculum the students gradually assume greater responsibility for learning while teachers relinquish traditional up-front direct teaching roles. The teacher, after moving off center stage, often acts as facilitator to student social knowledge and skill learning through a range of student-centered learning strategies.

Although not designed to be prescriptive in its implementation, the Sport Education model has key organizational structures that differentiate it from the traditional teacher-led physical education curricular model. Students work in the same small group throughout the extended length curriculum/season and are given responsibility for teaching each other skills within a cooperative group structure. The teacher facilitates this process by helping students with their decision-making for choice of practices, which must be inclusive for all members in the small group structure. This instructional organizational structure has many similarities with the contextual features of a task-involved climate (Ames, 1992) (see Table 1).

A number of studies in the pedagogy domain (Alexander & Luckman, 2001; Carlson & Hastie, 1997; Grant, 1992) have reported the positive effect that Sport Education has on student enthusiasm for physical education. Grant (1992) found that Sport Education promoted team affiliation, enhanced relationships among team members, and elevated enthusiasm among many students who previously seemed to dislike physical education and sport. Grant suggested that this student enthusiasm could be attributed to the fact that much of the decision-making and control of the experience was determined by the students themselves. Also, the students perceived the teacher to be less dominant than in traditional curricular approaches (Carlson & Hastie, 1997).

In a recent survey study of 344 Australian teachers' perceptions of the Sport Education model, Alexander and Luckman (2001) found that 83% of teachers agreed

**Table 1 Similarities of Sport Education Model With Ames' TARGET Structures of a Task-Involving Motivational Climate**

| Task-Involving Climate | Sport Education Curriculum Model |
|---|---|
| ***T**ask* | |
| Tasks involving variety and diversity are offered to students. | Students often choose from a range of offered practices. |
| ***A**uthority* | |
| Students are given leadership roles and are allowed to make decisions on tasks. | Students choose own skill practices and are responsible for setting up equipment. |
| ***R**ecognition* | |
| Recognition of accomplishment is private and self-referenced. | Recognition is based on individual progress in small group structures. |
| ***G**rouping* | |
| Students work in co-operative, mixed-ability groups. | Students work together within same small cooperative group structure. |
| ***E**valuation* | |
| Evaluation is self-referenced and based on personal improvement. | In the small group structure student-coaches emphasize individual improvement in order to benefit team performance goals. |
| ***T**iming* | |
| Time requirements are adjusted to personal capabilities. | During lesson time students often dictate the rate of progression through specific practices. |

that the model yields greater student interest in physical education than their previous approach to teaching sport in physical education. Much of this research on changes in student affective outcomes with the Sport Education model has been based on teachers' anecdotal accounts (e.g., Alexander & Luckman, 2001; Grant, 1992) reporting their impressions of student enthusiasm. Even when the effectiveness of the program was assessed in light of student perceptions, the designs did not incorporate appropriate comparison groups.

The use of appropriate comparison groups and quasi-experimental designs in physical education curricular research has the potential to provide greater generalization of results to other similar physical education settings. The use of contemporary social cognitive-based theories of student motivation in this process may also help us understand why curricular programs, such as the Sport Education model, are successful in increasing student motivation in physical education.

The purpose of this study was to determine the effect of two contrasting approaches, the Sport Education model and a traditional teacher-led approach, to teaching a unit of games-based activity in physical education. The dependent variables were student enjoyment, perceived effort, and perceived competence. It was hypothesized that students in the Sport Education curriculum would show greater increases in student enjoyment, perceived effort, and perceived competence from pre- to postintervention than the group taught with the traditional teacher-directed

approach. Furthermore, it was hypothesized that changes in students' perceptions of a task-involving climate, task goal orientation, and perceived autonomy would predict increases in student enjoyment, perceived effort, and perceived competence in the Sport Education curriculum group.

## Method

### *Setting and Participants*

The study took place in a state-run coeducational high school in the north of England. The sample consisted of children from low to middle income households. The representation of ethnic minority students in the school was approximately 10% and was reflective of the local community. Physical education was taught in single-sex groups for 1 hour per week and was compulsory for all students up to the age of 16 years. The two curricular programs were implemented in the games-based activity of basketball.

Participants in the study were 51 boys with a mean age of 14.3 yrs[1] (*SD* = 0.48). Their ethnicity consisted of 46 Caucasians and 5 of Asian descent. None of the students had been taught basketball in the current academic year, and none had experience with a Sport Education curriculum. Signed informed consent for the study was obtained from the school, the students, and their parents.

The teacher of the two intact classes had 5 years of teaching experience as well as previous experience with the Sport Education curriculum model in basketball physical education lessons. The teacher was also the researcher and therefore was aware of the purpose of the study.

### *Measures*

*Enjoyment, Effort, and Perceived Competence*. To assess student motivational responses to the curricular programs, we had the students respond to a version of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) as reworded for use in sport settings by McAuley, Duncan, and Tammen (1989). The IMI requires participants to respond to 18 items which assess four underlying dimensions of intrinsic motivation: Enjoyment/Interest, Effort/Importance, Perceived Competence, and Pressure/Tension. Each item was answered on a 7-point scale ranging from 1 = "very strongly disagree" to 7 = "very strongly agree." The scores for enjoyment, perceived effort, and perceived competence were calculated as the mean of the responses to each item of the respective subscales. Prior research has demonstrated adequate validity and reliability of the scale when used with adolescents in physical education (Goudas & Biddle, 1994; Mitchell, 1996).

*Achievement Goal Orientations*. The participants' dispositional achievement goal orientations were assessed using the Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda & Nicholls, 1992). This questionnaire requires participants to think of when they feel most successful in physical education and then respond to 13 items reflecting an ego or a task goal orientation. Each item was

[1] Students in England generally start high school at age 13 (Year 9), which is equivalent to Grade 8 in the U.S. The students in this study were from Year 10, the equivalent of high school freshman in the U.S.

answered on 5-point scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The scores for task and ego goal orientation were calculated as the mean of the responses to each item of the two subscales. Past research with English secondary school students in physical education classes has demonstrated that the instrument is valid and reliable (Duda, Fox, Biddle, & Armstrong, 1992).

*Perceived Autonomy*. Student perceived autonomy was assessed using a 20-item questionnaire adapted to physical education by Goudas, Biddle, and Fox (1994). The items were taken from the Academic Self-Regulation Questionnaire (ASRQ; Ryan & Connell, 1989) and the Academic Motivation Scale (Vallerand, Pelletier, Blais, et al., 1992). The questionnaire consists of five subscales representing different degrees of autonomy. Ryan and Connell (1989) have shown that, using some simple mathematical computations, one can obtain an index of self-determination—the Relative Autonomy Index (RAI)—from these subscales. The RAI represents a continuum of perceived autonomy, with positive scores indicating higher levels of perceived autonomy. Goudas et al. (1994) demonstrated that all five subscales in the instrument had acceptable reliability and validity when used with adolescent physical education students.

*Perceptions of Motivational Climate*. Students' perceptions of the task- and ego-involving motivational climate were assessed with the Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ; Papaioannou, 1995). Evidence for the validity of the LAPOPECQ to assess motivational climate in physical education has been established based on a sample of nearly 1,400 Greek high school students (Papaioannou, 1995). The LAPOPECQ consists of five factors. Two factors represent a task-involving climate and include 6 items that tap student perception of teachers' behaviors and 5 items that measure students' satisfaction with learning. There are 17 additional items measuring three aspects of an ego-involving climate: students' worries about mistakes, performing better than others, and superior performance without effort. Students responded to each statement on a 5-point scale ranging from 1 = "strongly disagree" to 5 = strongly agree. Mean scores for task-involving and ego-involving climate were calculated using the mean scores of their corresponding items.

*Teacher Behavior*. Differences in student motivation between the two curricular approaches could be the result of differing amounts or types of support offered by the teacher to the students during lessons. To examine whether the teacher's verbal interaction with the students differed between the two groups, we videotaped a single lesson from each curricular program and transcribed the teacher's verbal behavior. The observations were videotaped during the lesson prior to the issue of the postintervention questionnaires. Teacher verbal behavior was coded using an adapted form of the Coach Behavior Assessment System (CBAS; Smith & Smoll, 1990).

The adapted form examined 12 categories of teacher behavior organized into two major dimensions: (a) general teacher-initiated behavior, and (b) teacher behavior in response to students' performance. The first dimension of teacher-initiated behavior involves technical instruction, organization, general communication, and general encouragement. The second dimension of reactive teacher behaviors involves reinforcement and non-reinforcement responses to desirable performance, and reactions to mistakes including encouragement, technical instruction, punishment, and lack of response. Previous research (Goudas, Biddle,

Fox, & Underwood, 1995) on teaching styles and student motivation has utilized the CBAS in order to examine the consistency of teacher behavior across differing curricular programs.

The transcripts from the videotapes were coded by the researcher and one other person who was blind to the purposes of the study. The second observer was trained prior to the intervention to identify the categories of teacher behavior relevant to the adapted CBAS. Due to the number of categories of teacher behavior included in the CBAS, an extensive training was undertaken. Sample 10-min videotape segments of teaching episodes that were not part of the intervention were filmed. During observations of the first two teaching episodes, exemplars of each defined category of teacher behavior were identified. Subsequent segments of teaching were then observed and coded independently until a criterion level of 80% interobserver agreement was reached for each segment. After this criterion was met, each intervention sample lesson was coded independently. Observations were recorded by writing down every coded behavior the teacher exhibited during the two sample lessons. Interrater reliability was found to be 0.88 for the Sport Education lesson and 0.82 for the traditional lesson observation.

### *Design and Procedure*

Due to the use of intact classes, it was not possible to make a random assignment of participants to the two levels of the independent variable (Sport Education and traditional programs). Therefore the study utilized a nonequivalent control group design (Campbell & Stanley, 1963) which signifies that the groups may be nonequivalent prior to intervention due to some systematic difference between the two classes. The dependent variables were the student motivational indices of enjoyment, perceived effort and perceived competence, student perceived motivational climate, achievement goal orientation, and perceived autonomy. All variables were assessed before and after the intervention.

In order to reduce investigator selection bias, prior to the start of the intervention the Sport Education curriculum model ($n$ = 26) and a traditional approach model ($n$ = 25) were randomly assigned by an assistant to the two intact groups. One week prior to the basketball program, all students completed a series of baseline questionnaires in a quiet classroom setting. They were informed that they would be taking part in a study that "would look for new ways to teach PE," but they were not informed of the exact purposes of the study. The questionnaires took approximately 20 minutes to complete and were administered to each class separately. The students were encouraged to be as honest as possible and were assured that their responses would be confidential. At the end of the 8-week intervention all students again completed the same questionnaires.

*Sport Education Intervention*. In the experimental condition the teacher implemented the Sport Education model. The intervention model followed a three-phase format: a teacher-directed skill development phase, a preseason scrimmage phase, and finally a formal competition phase. The teacher-directed skill development phase involved 3 lessons, during which students led warm-ups but were given teacher instructions on the generic skills of scoring, passing, and dribbling. The preseason phase also involved 3 lessons and was designed primarily for students to work in their teams with practices led by the student-coach and facilitated by the teacher. In this phase the students took responsibility for refereeing and the choice

of tactics and team strategies. During this phase no formal records were kept of scrimmage results. The formal competition phase involved 2 lessons and consisted of teams practicing for a 20-min period and then participating in two competitive games per lesson. Although during this phase the students had the choice of warm-up and skill session and were responsible for refereeing and scoring, the introduction of formal competition could have fostered some elements of an ego-involving climate (e.g., public and normative evaluations of success).

During each phase of the Sport Education program, the specific responsibilities associated with the roles of coach, referee, captain, and scorer were explicitly stated to the students. Students on each team were responsible for selecting individuals to fulfill each role. In order to create an accountability system for the student-led selection process, the students signed contracts of role responsibility designed by the teacher and then returned the contracts to the teacher.

*Traditional Approach Group*. For the group taught with a traditional style of teaching, the format of every lesson was similar. Each lesson consisted of a 10-min warm-up followed by a 20-min skill related practice and ending with a 20-min round-robin 5-v-5 tournament. The basketball drills and warm-up practices used in this approach were at the same level of skill development as in the Sport Education curriculum model. For the 8 weekly lessons using the traditional style of teaching, most of the decisions on choice of tasks, team structure, and rate of progression were dictated by the teacher. Instruction was issued to the whole class rather than to small group settings, and students were not responsible for refereeing, coaching, or scoring in any direct or public way.

### *Change in Dependent Variables from Pre- to Postintervention*

The first research question examined whether the students in the Sport Education curriculum group would report a greater increase in enjoyment, perceived effort, and perceived competence than those in the traditional curriculum group. Three separate Group (Sport Education vs. Traditional) $\times$ Time (Pre/Post intervention) repeated-measures ANOVAs were conducted. The statistic of interest was the attainment of a significant Group $\times$ Time interaction effect for each variable—enjoyment, effort, and perceived competence. We made a Bonferroni adjustment to the alpha level (new $p = .01$) as a result of conducting multiple ANOVA tests. To determine any within-group changes in the dependent variables from pre- to postintervention, we performed paired sample *t*-tests, i.e., pre/post for Sport Education and for traditional curriculum. We also carried out independent sample *t*-tests, Sport Education vs. traditional, to examine mean differences in the dependent variables from pre- and postintervention. As a result of the multiple *t*-tests being performed during these analyses, we undertook a Bonferroni adjustment to the alpha level (new $p = .006$).

The second hypothesis postulated that changes in student perceptions of a task-involving climate, task goal orientation, and perceived autonomy would significantly predict the postintervention dependent variables of student enjoyment, perceived effort, and perceived competence for the Sport Education group. No such significant effects were hypothesized for ego-involving climate and ego orientation. Three separate backward elimination hierarchical multiple regression analyses were conducted. Preintervention measures of task and ego achievement goal orientations, perceptions of task and ego motivational climate, and perceived

**Table 2 Cronbach's Alpha Coefficients ($M \pm SD$) for Pre- and Postintervention Measured Dependent Variables for Both Programs**

| Dependent variable | | Sport Education ($n$ = 26) $M$ | $SD$ | Traditional ($n$ = 25) $M$ | $SD$ | $a$ |
|---|---|---|---|---|---|---|
| Enjoyment | Pre | 4.51 | 1.21 | 5.25 | 0.93 | 0.73 |
| | Post | 5.60** | 0.75 | 5.13 | 0.89 | 0.81 |
| Effort | Pre | 5.14 | 0.94 | 5.62 | 0.74 | 0.76 |
| | Post | 5.73** | 1.03 | 5.45 | 1.03 | 0.70 |
| Perceived competence | Pre | 4.82 | 0.84 | 4.76 | 1.30 | 0.70 |
| | Post | 5.45 | 1.04 | 4.81 | 1.15 | 0.79 |
| Task goal orientation | Pre | 3.72 | 0.53 | 4.09 | 0.56 | 0.73 |
| | Post | 4.11 | 0.61 | 3.96 | 0.59 | 0.82 |
| Ego goal orientation | Pre | 2.84 | 0.70 | 2.57 | 1.04 | 0.84 |
| | Post | 2.50 | 0.79 | 2.31 | 0.82 | 0.88 |
| Task climate | Pre | 3.74 | 0.51 | 3.97 | 0.62 | 0.72 |
| | Post | 3.91 | 0.47 | 3.71 | 0.68 | 0.70 |
| Ego climate | Pre | 2.98 | 0.46 | 3.01 | 0.64 | 0.61 |
| | Post | 2.98 | 0.44 | 2.87 | 0.41 | 0.65 |
| Perceived autonomy | Pre | 6.93 | 3.08 | 4.91 | 7.44 | 0.81 |
| | Post | 7.63 | 2.92 | 4.63 | 5.74 | 0.73 |

** $p < .006$.

autonomy were each entered into a regression model in the first block of the analysis to control for the initial level of these variables. In the second block, postintervention goal orientations, perception of the motivational climate, and perceived autonomy were entered as independent variables into the model.

## Results

### *Preliminary Analyses*

Cronbach alpha coefficients, means, and standard deviations for all measures are displayed in Table 2. The alpha coefficients for all measures were deemed acceptable based on Nunnally's (1978) cutoff criterion of .70 for the psychological domain with the exception of ego-involving climate (pre $\alpha = .61$, post $\alpha = .65$). However, due to the importance of this measure for this study, the subscale was retained.

According to Kenny and La Voie (1985), in order to determine whether the individual or the group should be used as the unit of analysis, a test of nonindependence of individual observations must be performed. The calculation of an intraclass correlation coefficient (ICC) provides evidence of the degree of variance in responses among members of a group in relation to the responses of nongroup members (Zhang, Hausenblas, Barkouras, & Pease, 2002). Intraclass

correlation coefficients can range from –1 to +1, with a positive ICC indicating that group members are more similar than nongroup members, and therefore that the group should be the unit of analysis. When there is a negative or nonsignificant positive ICC, the unit of analysis should be kept at the individual level because there is no evidence of a group level effect (Kenny & LaVoie, 1985). ICCs calculated on preintervention student motivational outcomes revealed negative ICCs for enjoyment, effort, and perceived competence ($r$ = –.07, –.18, and –.10, respectively). Postintervention intraclass coefficient calculations also revealed negative ICCs for enjoyment, effort, and perceived competence ($r$ = –.24, –.12, and –.22, respectively). Therefore, subsequent analyses utilized the individual as the unit of analysis.

In order to test for differential teacher behavior across the two curricular programs, we computed chi-square tests on the frequencies of each behavioral category of the CBAS. As a result of the multiple $\chi^2$ tests being performed, we made a Bonferroni adjustment to the alpha level (new $p$ = .005). The results revealed no significant differences between curricular lessons in all categories of the teacher-reactive behavior or the teacher-initiated behavior. Thus the results of these tests suggest there was little variation in teacher behavior between the two groups.

Table 2 shows the means and standard deviations in student enjoyment, perceived effort, and perceived competence for the Sport Education and the traditionally taught groups before and after the intervention. Repeated-measures ANOVA revealed a significant Group × Time interaction for enjoyment, $F(1, 26) = 9.23$, $p < .01$, $\eta^2 = .22$; and perceived effort, $F(1, 26) = 6.68$, $p < .01$, $\eta^2 = .17$; but not for perceived competence, $F(1, 26) = 3.30$; $p > .01$; $\eta^2 = .09$. Paired-sample $t$-tests revealed that the Sport Education curriculum group improved significantly from pre- to postintervention in enjoyment, $t(25) = –3.11$, $p < .006$; and perceived effort, $t(25) = –2.94$, $p < .006$. In contrast, the traditionally taught group did not show any significant pre- to postintervention gains in enjoyment, $t(24) = .61$, $p > .006$; perceived effort, $t(24) = .79$, $p > .006$; or perceived competence, $t(24) = –.21$, $p > .006$. Independent sample $t$-tests revealed no significant differences between groups on students' enjoyment, perceived effort, and perceived competence prior to the intervention. Significant pre/ postintervention differences were found between the two curricular groups on the dependent variables of student enjoyment, $t(49) = –3.58$, $p < .006$; and perceived effort, $t(49) = –3.32$, $p < .006$.

The regression equations related to the prediction of postintervention values of enjoyment, perceived effort, and perceived competence for students in the Sport Education curriculum group are displayed in Table 3. After controlling for the initial levels of the independent variables in each regression, backward-elimination hierarchical regression analyses revealed that postintervention task goal orientation, perceptions of a task-involved climate, and perceived autonomy predicted a significant amount of variance in students' postintervention motivational responses. Specifically, students' perception of a task-involved climate predicted a significant amount of variance in student enjoyment ($\beta = .48$), perceived effort ($\beta = .44$), and perceived competence ($\beta = .40$), all $p < .05$. Furthermore, postintervention task goal orientation significantly predicted both postintervention student-perceived effort ($\beta = .51$) and perceived competence ($\beta = .55$), both $p < .05$. Postintervention perceived autonomy was also found to contribute significantly to the prediction of student-perceived competence ($\beta = .32$), $p < .05$. Finally, ego goal orientation negatively predicted student enjoyment ($\beta = –.47$), $p < .05$.

**Table 3 Backward Elimination Hierarchical Regression Analyses of Achievement Goal Orientations, Perceptions of Motivational Climate, and Perceived Autonomy in the Sport Education Group ($n$ = 26)**

| Variable | | Predictor | $R^2$ | β | $t$ |
|---|---|---|---|---|---|
| Enjoyment | Step 1 | | .27 | | |
| | | Pre- task climate | .10 | .24 | 1.86 |
| | | Pre- perceived autonomy | .03 | .09 | 1.33 |
| | | Pre- ego goal orientation | .05 | .14 | –1.27 |
| | Step 2 | | .36 | | |
| | | Post- task climate | .13 | .48 | 2.59* |
| | | Post- ego goal orientation | .13 | –.47 | 2.02* |
| | | Post- perceived autonomy | .06 | .19 | –.93 |
| Effort | Step1 | | .28 | | |
| | | Pre- perceived autonomy | .07 | .20 | 1.32 |
| | | Pre- task climate | .06 | .14 | .96 |
| | | Pre- ego goal orientation | .05 | –.12 | –.75 |
| | Step 2 | | .45 | | |
| | | Post- task goal orientation | .17 | .51 | 2.04* |
| | | Post- task climate | .15 | .44 | 1.96* |
| | | Post- perceived autonomy | .08 | .26 | 1.43 |
| Perceived competence | Step 1 | | .18 | | |
| | | Pre- task climate | .05 | .17 | 1.65 |
| | | Pre- perceived autonomy | .04 | .07 | 1.23 |
| | | Pre- task goal orientation | .03 | .05 | 1.02 |
| | Step 2 | | .30 | | |
| | | Post- task goal orientation | .11 | .55 | 2.47* |
| | | Post- task climate | .10 | .40 | 2.07* |
| | | Post- perceived autonomy | .08 | .32 | 1.96* |

*$p < .05$

## Discussion

The purpose of the present study was to assess the effectiveness of a Sport Education intervention in enhancing students' enjoyment, perceived effort, and perceived competence in physical education. The results showed that students in the Sport Education curriculum group reported significantly higher postintervention enjoyment and perceived effort than those taught with the traditional approach, i.e., the comparison group. These group differences were not significant prior to the intervention program, which is particularly important as the students were not randomly assigned into the two groups. Students in the Sport Education group reported significant pre- to postintervention increases in enjoyment and perceived effort, but not in perceived competence; for the latter variable there was a nonsignificant increase in the mean scores from pre- to postintervention. In contrast, the traditionally taught curriculum group did not report significant changes in any of the three motivational indices.

The Sport Education curriculum model effectively brought about positive changes in students' perceptions of a sport-based physical education program. The increases in several motivational indices are consistent with the findings of Alexander, Taggart, and Medland (1993), who reported increases in enthusiasm and enjoyment among boys in a Sport Education class. The findings also lend support to previous research on teacher anecdotal perceptions of the positive effect of Sport Education on student motivation in physical education (Alexander & Luckman, 2001; Grant, 1992). Furthermore, Alexander, Taggart, and Thorpe (1996) analyzed student perceptions of the Sport Education model and concluded that the students prefer the model because they learn more and are more involved in the lessons compared to traditional physical education curricula.

In a more recent study, which evaluated teachers' perceptions of the Sport Education model, Alexander and Luckman (2001) suggested that students enjoy the model because the emphasis is not only on learning sport skills but also on learning personal and social skills. Previous research has shown that a shift in emphasis from just learning sport skills to working in cooperative groups is conducive to fostering student enjoyment (Hastie, 1996).

Alexander and Luckman (2001) claimed that the pedagogy of a model which offers an extended season, persisting groups, less direct teaching, and more responsibility for students can create meaning, purpose, and enjoyment for students in physical education. Hastie (1998) has suggested that the extended season and persisting grouping of the Sport Education curriculum can increase student skill and tactical development. Although we did not assess changes in student skill competence in basketball as part of this study, the lack of significant improvement in the Sport Education students' perceived competence might be due to the relatively short duration (eight 1-hr lessons) of the intervention and fewer opportunities for students to practice skills. Research by Alexander and Luckman (2001) has proposed that many teachers who utilize the Sport Education model do so primarily as a vehicle to promote student prosocial development, values, and attitudes.

Although a primary goal of Sport Education is to develop "competent performers" (Siedentop, 1994, p. 4), a teacher's implementation of the model which overemphasizes student affective outcomes, and the accountability systems that accompany these goals, may indirectly affect the model's potential for developing student skill and tactical performance. Further research is required to examine the potential effect—not only of the duration of the season but also the implementing teacher's curricular goals—on student skill development and perceptions of competence in the Sport Education unit.

This study proposed that the structure of the Sport Education curriculum has many commonalties with Epstein's (1989) TARGET structures for fostering a task-involved climate. Such a climate has been associated with more adaptive student cognitive and affective motivational patterns in physical education (Mitchell, 1996; Papaioannou, 1995). To test this claim, the present study assessed whether changes in students' perceptions of a task-involving climate, perceived autonomy, and task goal orientation would significantly predict student postintervention enjoyment, perceived effort, and perceived competence in the Sport Education curriculum. The results of the hierarchical regression analysis revealed that postintervention task goal orientation explained a significant amount of variance in students' reported postintervention perceived effort and competence. Furthermore, students' perception of postintervention task-involving climate significantly predicted en-

joyment, perceived effort, and perceived competence, thus supporting our hypothesis. Previous research (Mitchell, 1996; Papaioannou, 1995) has indicated that students in physical education report higher intrinsic motivation when they perceive a task-involving climate.

These results suggest that the Sport Education unit delivered in this intervention facilitated perceptions of a task-involving climate, which in turn fostered adaptive motivational responses. Furthermore, postintervention perceived autonomy positively predicted perceived competence. This finding supports the notion that perceived autonomy can have a positive effect on student motivational outcomes. In practical terms this means that when students engage in the Sport Education curriculum, they do so because they personally grasp its value for game play and team building, and so are more likely to feel competent in the various sport activities. Finally, although not part of the initial hypotheses of the study, it is of interest that post-intervention ego orientation negatively predicted enjoyment in the Sport Education curriculum. This finding is consonant with theoretical arguments and empirical evidence (Ames, 1992).

The results of this study indicate that the structural characteristics of the Sport Education curriculum, such as team continuity and peer coaching, could facilitate a task-involving climate. Despite this, the inherent nature of formal competition in the final phase of the curriculum may have attenuated, for some students, the positive experiences from Sport Education. The phase of formal competition in the model brings with it the potential for students to judge success based on norm-referenced criteria. This type of evaluation can create an ego-involving climate, and many lower skilled students may perceive this competitive environment more as a threat and less intrinsically motivating (Mitchell, 1996). Although the use of formal competition is a basic tenet of the Sport Education curriculum model, a teacher's overemphasis on game results in determining season champions could create an environment that forces children to overtly evaluate themselves in relation to others. Implementing multiple strategies such as fair play evaluations, performance of duty roles, and other season related tasks may help prevent excessive emphasis on normative ability comparisons and the negative motivational outcomes associated with an ego-involving climate.

Although this study has contributed to the literature on how a goal-perspective approach can optimize learning environments in sport-based physical education, there are limitations that must be considered. One was the size and composition of the intervention sample. With only two groups of boys in its design, this study cannot be readily generalized to girls taking part in the Sport Education curriculum. There is also the possibility of bias in that the researcher acted as the teacher and was aware of the study objectives. The use of several teachers delivering the Sport Education curriculum to a larger number of coeducational classes might alleviate this potential sampling and researcher bias. Furthermore, researchers should conduct longitudinal studies that would provide more insight into how increased exposure to the Sport Education curriculum might shape students' long-term motivational responses to physical education.

Despite its limitations, however, the results of this study have shown that the Sport Education curriculum model has many structural features which, when utilized effectively by teachers, have the potential to foster more adaptive student motivational responses by creating an environment that better caters for self-improvement, choice, and equity for students.

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