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**METHODOLOGY**

# Comparison of the Motivational Climates Created During Multi-Activity Instruction and Sport Education

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## Abstract

*Previous research has suggested that sport education (SE) may be a superior curriculum model to multi-activity (MA) teaching because its pedagogies and structures create a task-involving motivational climate. The purpose of this study was to describe and compare the objective motivational climates teachers create within the MA and SE models. Specific goals were to determine whether (a) different climates were created in the models and (b) the climate created in SE was superior to that created in MA teaching. Participants were two pre-service teachers who turn-taught one 10-lesson MA unit and one 10-lesson SE soccer unit during a middle school early field experience. The units were filmed and coded with the Physical Education Climate Assessment Instrument (PECAI). Descriptive data were generated for individual lessons within and across each unit. Lesson-by-lesson profiles of climate production within each unit were plotted. A chi-square test for independence was employed to determine whether differences existed in the climates created within the units. Results indicated that similar climates were created within the MA and SE units and that these climates were strongly ego*

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*involving. Possible reasons for the SE climate being ego involving were an overemphasis of the competitive elements of the model and the impossibility to create authentic sporting experiences without also creating an ego-involving climate.*

Sport education (SE; Siedentop, Hastie, & van der Mars, 2011) is a highly favored physical education model. Developed from observations of high-quality youth sport and the teacher effectiveness literature concerning management, SE is consistent with other instructional approaches including student-centered learning, teaching games for understanding, cooperative learning, authentic assessment, constructivism, and outcome-based education (Siedentop, 2002). The objectives of the model are to mirror the best elements of authentic sport and to produce persons who are competent, literate, and enthusiastic (Siedentop et al., 2011). Reviews of the research of SE provided by Curtner-Smith and Sofo (2004), Wallhead and O'Sullivan (2005), Kinchin (2006), and Hastie, Martínez, and Calderón (2011) have indicated that teachers' and students' overall response to SE has been positive.

## Comparison of Sport Education and Traditional Forms of Games Teaching

Traditionally, multi-activity (MA) instruction (Siedentop, Mand, & Taggart, 1986) has involved teachers employing mostly direct instruction and developing units and lessons in which students engage in increasingly complex skill drills, practices, and small-sided and conditioned games (Curtner-Smith, 2001). Theoretical comparisons of MA and SE have suggested that SE has an advantage because it is more culturally relevant (Alexander & Luckman, 2001; Alexander, Taggart, & Thorpe, 1996). As noted by Kirk and Almond (1999), in Lave and Wenger's (1991) terms, SE encourages greater "legitimate peripheral participation" in authentic sporting contexts and is, therefore, a prime example of "situated learning." The higher level of student engagement also has been found to increase the students' perceptions of fun (MacPhail, Gorely, Kirk, & Kinchin, 2008), interest (Hastie & Sinelnikov, 2006), and enjoyment (Wallhead & Ntoumanis, 2004). In addition, within SE, the students assume increasingly more responsibility, whereas MA is a teacher-driven model (Alexander et al., 1996). Moreover, researchers who have examined SE and MA instruction using a task structures or ecological perspective (Carlson & Hastie, 1997; Hastie, 2003; Hastie & Pickwell, 1996; Hastie & Siedentop, 1999; Sinelnikov & Hastie, 2008) have noted

that the purpose of the teacher's managerial system in MA teaching is, in part, to dampen the student social system to allow the instructional system to flourish.

In contrast, Alexander and Luckman (2001) implied that the SE model is theoretically superior to MA instruction because its structure empowers teachers and, as a consequence, facilitates an improvement in teacher–student relationships. Similarly, Ennis (1999) noted that the MA model's "curricular scaffolding" creates "negative forces" and compels even the most skilled teachers to spend excessive time intervening intervening between students to facilitate positive social interactions, prevent overcompetitiveness, and provide support for students with lower skill levels. By comparison, Ennis observed that the SE model's scaffolding promotes "positive social relations" within a class because it helps cultivate a "sense of community" and disperses ownership and authority. This decreases the need for teachers to negotiate with highly skilled and dominant groups of students over aspects of the curriculum including instructional tasks and levels of accountability.

Despite these compelling theoretical arguments for SE being a superior model to MA teaching, few empirical studies aimed at comparing high level SE and MA teaching have been well designed. Of the studies that have been completed, Curtner-Smith and Sofo (2004) found that pre-service teachers who taught 10-lesson soccer units using both models perceived the SE unit as more successful. Similarly, Browne, Carlson, and Hastie (2004) found that students taught rugby football within a 20-lesson SE season improved their understanding of the game to a greater degree than students who were taught the same content within a well-designed MA unit of the same length. In contrast, both models led to similar gains in students' knowledge about the game. However, in two studies comparing the influence of 10-lesson SE and MA soccer units on factors related to students' gains in health-related fitness (Parker & Curtner-Smith, 2005) and pre-service teachers' use of teaching styles (Parker & Curtner-Smith, 2012) produced surprising results. In contrast to their hypothesis and the findings of Hastie and Trost (2002), Parker and Curtner-Smith (2005) found that middle school students spent more time in moderate to vigorous physical activity during the MA unit and that the inferential statistical tests were nonsignificant when comparing health-related variables. Finally, Parker and Curtner-Smith (2012) found no statistical difference in pre-service teachers' use of teaching styles (Mosston & Ashworth, 2008) during the MA and SE units. Furthermore, the pre-service teachers spent

the majority of their time in practice style and management in MA and SE, which annulled their hypothesis for SE in the study and conflicts with the SE model expectations of Siedentop et al. (2011).

## Theoretical Framework

### Achievement Goal Theory

Achievement goal theory has received a good deal of attention in the last 20 years (Chen, 2001; Duda, 1996; Duda & Nicholls, 1992; Nicholls, 1989; Todorovich & Model, 2005). In the physical education setting, those conducting research from this perspective have focused on the nature of students' goals or on the climate teachers created, which may influence these goals (Carpenter & Morgan, 1999; Liukkonen, Barkoukis, Watt, & Jaakkola, 2010; Perlman & Karp, 2007).

Achievement goal theory argues that students generally are oriented to one of two types of goals when making decisions as to whether they have succeeded in achievement settings such as physical education (Ames, 1992a, 1992b; Dweck & Leggett, 1988). Students who gauge success based on self-improvement and task mastery exhibit a task orientation. Conversely, students who determine success by contrasting the performances of others with their own possess an ego orientation (Nicholls, 1984, 1989). Some researchers have suggested that individuals who are ego oriented may be subdivided into those who are motivated by outperforming their peers (performance-approach) and those who avoid participating in tasks and activities for fear of failing to meet the standards of their peers (avoidance-approach; Elliot & Church, 1997; Xiang, McBride, & Bruene, 2006). More recently, further subdivisions of mastery-approach goals, learning goals, challenge-seeking goals, outcome goals, ability goals, performance-approach goals, and ought-approach goals have been suggested and investigated (Mouratidas, Lens, and Sideridis, 2010), specifically to what extent mastery-related outcome, ability, and normative goals are interrelated or are conceptually different.

Achievement goal theory also suggests that the motivational climates that teachers create may influence the goal orientations of their students (Ames, 1992a, 1992b; Dweck & Leggett, 1988). Climates that focus on self-improvement (i.e., task-involving climates) appear to foster a task orientation. Conversely, climates that promote comparisons of performance and ability among students (i.e., ego-involving climates) appear to foster an ego orientation (Todoro-

vich & Curtner-Smith, 2002, 2003). Although some scholars have examined participants' perceptions of the motivational climate during their research (Treasure & Roberts, 2001), few pedagogists have studied the actual or objective climate that instructors create (see Sinelnikov & Hastie, 2010).

Most researchers have argued students are better off being task oriented as they are more likely to enjoy, persist with, and engage in activity (Duda, 1996; Treasure & Roberts, 1995). Moreover, some research has indicated that ego-involving climates promote more negative and maladaptive behaviors (e.g., giving up when faced with difficulty, selecting tasks that are easy), whereas task-involving instructional climates promote more positive and adaptive behaviors (e.g., persisting when faced with problematic tasks, selecting more challenging tasks; Carpenter & Morgan, 1999). In addition, some evidence has suggested that students learn more (Biddle, 2001; Martin, Rudisill, & Hastie, 2009), are more likely to believe that effort leads to achievement (Solmon, 1996), engage in higher intensities of physical activity (Parish & Treasure, 2003; Treasure & Roberts, 2001), increase intrinsic motivation (Mitchell, 1996), and are highly satisfied (Treasure, 1997) in a task-involving climate. Conversely, ego-involved climates have been associated with a decrease in students' intrinsic motivation (Papaioannou, 1995) and students' perceptions of teacher favoritism toward more able performers (Treasure, 1997).

A few researchers, however, have taken issue with this line of thought and argued for providing a mixed climate that includes task-involving and ego-involving elements (Steinberg, 1996; Steinberg & Maurer, 1999). The rationale has been that eventually students need to compare themselves with others to determine whether they are successful. In addition, these researchers have suggested that the self-esteem of ego-oriented students may be enhanced significantly when they are taught within an ego-involving climate. Furthermore, in their extensive review of research on students' goals, interests, and motivation, Hidi and Harackiewicz (2000) suggested that "the positive consequences of performance [ego] goals have been underappreciated to date, and we believe it is critical to consider the possibility that performance [ego] goals can promote adaptive achievement behavior in some educational settings" (p. 164).

This study used achievement goal theory as the basis for assessing the relative effectiveness of traditional multi-activity (MA) teaching and SE. To date, only one study has used achievement goal theory to measure the objective motivational climate of SE and only

two have used it as the basis for comparing the effects of SE and MA teaching. Sinelnikov and Hastie (2010) found a mixed, overall motivational climate of mastery (task involving) and performance (ego involving) when an expert taught an SE volleyball unit (16 lessons) to male and female Russian ninth grade students who were unfamiliar with the model. However, Wallhead and Ntoumanis (2004) found that an eight-lesson SE basketball unit led to an increase in 14-year-old male students' enjoyment and perceived effort, whereas a similar MA unit did not. An increase in the students' perceptions of a task-involving climate in the SE season was shown to be largely responsible for these results. Wallhead and Ntoumanis suggested that this increase was likely because SE "has many similarities with the contextual features of a task-involved climate" (p. 6). These authors, however, conceded that the overemphasis on formal competition by teachers could serve to promote an ego-involved climate and negate positive influence of SE on students, particularly those who are less able. This conclusion is supported by Sinelnikov and Hastie (2010), who found a more performance-oriented climate during the formal competition phase of the SE unit.

Additionally, Spittle and Byrne (2009) found that five-lesson invasion game MA units led to a decrease in 13- and 14-year-old students' perceived competence, whereas 10-lesson SE units on the same content did not. They also found that students' perceptions of the class climate being task involving decreased significantly during MA units but not during SE units. These findings led them to suggest that the climate teachers create during SE units is more task-involving than in MA units and that this climatic superiority is responsible for maintaining levels of motivation, in terms of perceived competence, within SE units.

## Purpose

Although their studies were strong and informative, Sinelnikov and Hastie (2010) did not compare SE and MA directly and Wallhead and Ntoumanis (2004) and Spittle and Byrne (2009) measured the motivational climates in SE and MA units only as perceived by students. In addition, Wallhead and Ntoumanis and Spittle and Byrne employed a pre–post design that involved measuring students' perceptions of the climate before the units started and after they were completed. "Black box" experiments such as these, which do not involve examining the teachers' pedagogies, were heavily criticized when sport pedagogy research was in its infancy (see Locke, 1977). Moreover, Wallhead and Ntoumanis used the Learning and Pref-

erence Orientations in Physical Education Classes Questionnaire (Papaioannou, 1995) and Spittle and Byrne employed the Perceived Motivational Climate in Sport Questionnaire (see Walling, Duda, & Chi, 1993). Sport pedagogy researchers also have criticized these paper and pencil inventories (e.g., Hastie, 2007; Zmudy, Curtner-Smith, & Steffen, 2009) on the grounds that they yield data that may not be as accurate as data generated by observing instruction directly. In short, their designs meant that Wallhead and Ntoumanis and Spittle and Byrne could only infer, without objective data to support, that the teachers in their studies employed pedagogies and structures that created task-involving climates during SE and that these climates were different and superior to those created in MA units.

Therefore, the purpose of this study was to describe and compare the objective motivational climates teachers create within the MA and SE models. The specific goals were to determine whether (a) different climates were created in the two models and (b) the climate created in SE was superior to that created in MA teaching (e.g., task involving vs. ego involving).

## Method

### Study Design

This study analyzed teaching collected by video by the authors. At the time of the study, the first author was a veteran physical educator and PhD candidate and the second author a veteran physical education teacher educator. Institutional review board approval was attained for this study. The participants were two pre-service teachers engaged in an early field experience (EFE) within a physical education teacher education (PETE) program at a large public university in the southeastern United States. They were selected for the study, based on the observation and recommendation of their instructors, because of their considerable pedagogical ability and potential and willingness to participate in this study. The pre-service teachers were Caucasian, one male and one female, in their third year of a 4-year PETE program.

The pre-service teachers had studied teaching styles; effective teaching behaviors; evaluation, unit, and lesson planning; management; and curriculum models, including the MA and SE models, prior to beginning the EFE within a campus-based secondary methods course. The EFE involved the pre-service teachers teaching at a local middle school two times each week during a 5-week period.

The school was attended by students primarily from low-income families and included Caucasians and African Americans. Prior to the pre-service teachers starting the EFE, the school's physical education teachers explained that the pre-service teachers may face difficult disciplinary situations.

Within the EFE, the pre-service teachers team/turn-taught one 10-lesson mini-SE season to sixth grade students and one 10-lesson mini-MA unit to a combination of seventh and eighth grade students. Both classes had girls and boys. The subject matter of the units was soccer. The specific content for each unit is provided in Tables 1 and 2. The content for the units was prescribed to the pre-service teachers by the course supervisor as part of the EFE.

Mean length of SE lessons was 31.60 min (20.22 to 38.08 min), and mean length of MA lessons was 33.18 min (22.76 to 40.78 min). Mean class size for the lessons during the SE unit was 9.70 (*SD* = 0.82), and mean class size for MA lessons was 9.40 (*SD* = 0.52).

**Table 1**
*Multi-Activity Unit Content*

| Lesson | Content |
|---|---|
| 1 | i. Warm-up (chasing game).<br>ii. Practices juggling soccerball.<br>iii. Practices dribbling soccerball.<br>iv. 2 v. 2 small-sided game (keep ball).<br>v. Closure. |
| 2 | i. Warm-up (soccerball juggling practice).<br>ii. 2 v. 2 small-sided keep-ball game.<br>iii. Practices dribbling soccerball.<br>iv. 2 v. 2 small-sided game.<br>v. Closure. |
| 3 | i. Warm-up (tag-dribbling soccerball).<br>ii. 2 v. 2 small-sided game (keep ball using zones).<br>iii. Practices dribbling soccerball.<br>iv. 2 v. 2 small-sided game.<br>v. Closure. |
| 4 | i. Warm-up (king of the ring).<br>ii. Practices soccer tackling.<br>iii. 2 v. 2 small-sided game (end-to-end).<br>iv. Closure. |
| 5 | i. Warm-up (bandits).<br>ii. 2 v. 2 small-sided game (end-to-end).<br>iii. Practice soccer tackling.<br>iv. 4 v. 4 small-sided game (end-to-end).<br>v. Closure. |

**Table 1 (cont.)**

| Lesson | Content |
|---|---|
| 6 | i. Warm-up (bulldog).<br>ii. Practices in beating an opponent.<br>iii. 1 v. 1 group tournament (end-to-end).<br>iv. 4 v. 4 small-sided game (end ball).<br>v. Closure. |
| 7 | i. Warm-up (3 v. 3 small-sided game).<br>ii. Practices in beating an opponent.<br>iii. 5 v. 5 small-sided game.<br>iv. Closure. |
| 8 | i. Warm-up (tag-dribbling soccerball).<br>ii. Practices passing soccerball.<br>iii. 5 v. 5 small-sided game.<br>iv. Closure. |
| 9 | i. 5 v. 5 small-sided game.<br>ii. Skills assessment.<br>iii. Closure. |
| 10 | i. Cognitive assessment.<br>ii. 5 v. 5 small-sided game.<br>iii. Closure. |

**Table 2**
*Sport Education Unit Content*

| Lesson | Content |
|---|---|
| 1 | a. Team announcement.<br>b. Explain concept of sport education.<br>c. Making of team list.<br>d. Captain election.<br>e. Coach election.<br>f. Team name selection.<br>g. Team color selection.<br>h. Board member election.<br>i. Deciding of team logo.<br>j. Taking of team picture.<br>k. Equity officer election.<br>l. 4 v. 4 small-sided game.<br>m. Closure and explanation homework (students to complete player profile sheet). |
| 2 | a. Design team notice board and post team picture and schedule for season.<br>b. Captains lead warm-up supplied by pre-service teachers.<br>c. Teacher-directed lesson over basic skills, strategies, and rules (2 v. 2 small-sided game; practices dribbling soccerball; 4 v. 4 small-sided game).<br>d. Closure. |

**Table 2 (cont.)**

| Lesson | Content |
|---|---|
| 3 | a. Coaches lead warm-up supplied by pre-service teachers.<br>b. Teacher-directed lesson over basic skills, strategies, and rules (4 v. 4 small-sided game; practices soccer tackling; 4 v. 4 small-sided game).<br>c. Provide handout for homework so pupils can learn basic rules.<br>d. Election of two newspaper reporters and provide them with an interview guide. One reporter interviews the captain and one interviews the coach on the team's probabilities for the upcoming season.<br>e. Closure. |
| 4 | a. Multiple-choice rules assessment (must pass to be eligible to play).<br>b. Instruct scorekeeping (hand out scoresheets), keeping statistics (hand out a statsheet), and officiating (brief edification).<br>c. Team scrimmage (2 v. 2 or 3 v. 3) while "off-field" students officiate, keep score, and record statistics. Pupils rotate so all learn each role.<br>d. Class board to effect preseason poll.<br>e. Post interviews from captain and coach onto notice board.<br>f. Post other pertinent and motivating information on notice board.<br>g. Closure. |
| 5 | a. Furnish rules assessment results and reexamine if necessary.<br>b. Preseason scrimmages (5 v. 5). Games are to last 12 minutes with 2-minute halftimes for captain and coach-led team discussions. Pitches are 25 x 15 meters. 5-meter, cone-marked goals. Regular rules except no off-side. Goalkeepers may handle ball only within 5 meters of the goal. Defending players must be 5 meters from site of free-kick, corner-kick, or goal-kick. Typical throw-ins. Penalty kicks taken from 8 meters. Coach or captain can substitute players when ball is dead.<br>c. Duty team to keep score, collect statistics, and officiate (provide all necessary materials and clothing).<br>d. Put up results on notice board.<br>e. Two information officers must be elected to write a brief report of team's preseason games.<br>f. Team scout election to watch first opponent in "World Cup" and complete teacher-provided scouting report sheet.<br>g. Class board to conduct second preseason poll.<br>h. Closure. |

**Table 2 (cont.)**

| Lesson | Content |
|---|---|
| 6–9 | a. Pupils participate in culminating event (World Cup).<br>b. Rules same as preseason.<br>c. Scoring: 3 points for a win, 1 for a draw, 0 for a loss, and 0 or 1 for fair play and sportspersonship (judged by officials). All ties in league play broken by fair play scores, then by goal difference, and then penalty kicks.<br>d. Class board to select Most Valuable Players (MVPs), Most Sporting Players (MSPs), Most Improved Players (MIPs), and All-Tournament teams. |
| 10 | a. Awards ceremony (select a student to MC).<br>b. Awards presented to winners, MVPs, MSPs, MIPs, and All-tournament teams.<br>c. Provide refreshments. |

The pre-service teachers alternated as the lead teacher for each lesson within each unit. Lessons were taught on a community field close to the school with the exception of the fourth, sixth, and tenth lessons of both units, which were taught in a school gymnasium. In the competitive phase of the SE season (Lessons 5 to 9), the students taught by the pre-service teachers in the study played against teams of students taught by other pre-service teachers. For both units, one soccer ball was available for every two students.

## Data Collection

Lessons in the SE and MA units were filmed to form a data bank, which was used in Parker and Curtner-Smith (2005, 2012). The camera was located in a peripheral position so it did not disrupt instruction. The lead pre-service teacher wore a wireless microphone so that verbal behavior of both pre-service teachers could be recorded. Filming commenced when the lead pre-service teacher stated that a lesson was beginning and ended when the students were dismissed from the field or gymnasium.

## Verification of SE and MA Models

Metzler (2001) argued that sport pedagogy researchers studying the effects of curricular models should verify that the teaching being studied is congruent with each models' guidelines. The verification process employed with this data bank involved comparing the tasks listed in Tables 1 and 2 with what was observed live by the first author during the EFE and afterward on videotape. This protocol

revealed that the pre-service teachers followed the EFE plan closely and that the key features of the MA and SE models were included in their units.

### Systematic Observation Instrument

The 20 filmed lessons from the SE and MA units were coded with the Physical Education Climate Assessment Instrument (PECAI; Curtner-Smith & Todorovich, 2002). The PECAI is a systematic observation instrument that determines the actual or objective motivational climate of a physical education lesson.

The PECAI is based on the principles described by Epstein (1988) and Ames (1992b) regarding classroom climate and structure. These principles concern the components of a lesson that a teacher may alter. These components of Epstein's and Ames' principles are task, authority, rewards, grouping, evaluation, and time, and they are often referred to with the acronym TARGET. They are shown in Table 3. The degree to which a classroom is more ego or task involving is determined by the pedagogical choices teachers make in regard to these components (Epstein, 1988; Ames, 1992b).

**Table 3**
*Definitions of the Elements Coded by the Physical Education Climate Assessment Instrument*

| Alterable element | Ego-involving | Task-involving |
|---|---|---|
| Task | All pupils attempt the same task. The instructor determines goals. | Pupils choose to attempt different tasks. They are permitted to set their own goals. |
| Authority | The instructor makes all decisions about what pupils will learn, sets up all equipment, and conducts all pupil evaluations. | Pupils choose what they will attempt to learn, are given the opportunity to set up their own equipment, and are encouraged to evaluate their own performances. |
| Rewards | Recognition of pupils' accomplishments are made public and rewards are given for superior performances. | Recognition of pupils' accomplishments are kept private and rewards are given for improvement. |
| Grouping | An entire class or squad works on one task or pupils are grouped by their ability. | Pupils work on individual tasks or in small cooperative groups. Grouping is flexible and heterogeneous. |

**Table 3 (cont.)**

| Alterable element | Ego-involving | Task-involving |
|---|---|---|
| Evaluation | Evaluation is norm-referenced or rank-ordered and public. Progress is judged on the basis of whole group objectives and performance. | Evaluation is self-referenced and private. Progress is judged on the basis of individual objectives, participation, effort, and improvement. |
| Time | The instructor gives strict time limits for all pupils to complete tasks and establishes timelines for improvement. | Time limits for task completion are flexible. Pupils help to schedule timelines for improvement. |

*Note.* A strong ego-involving motivational climate is produced during a physical education lesson or sports practice under conditions described in the middle column of the table, whereas a strong task-involving climate occurs under the conditions described in the right column (Todorovich & Curtner-Smith, 2003).

Using the PECAI (see Curtner-Smith & Todorovich, 2002), involves a researcher coding tasks that occur within a physical education lesson. The definition of a task is "a unit of work given verbally and/or visually by the teacher that focuses [students] on the intended skill or aspect of that skill to be executed once the activity is initiated" (Rink & Werner, 1989, p. 272). When coding each task, the researcher decides whether its task, authority, rewards, grouping, evaluation, and time components indicate that the teacher is creating an ego-involving or task-involving climate based on criteria outlined by Epstein (1988) and Ames (1992b). Moreover, if the orientation of one of these components for a specific task cannot be determined, it is coded as neutral. Following the presentation or introduction of each task, the film is paused and the task and authority components are coded. The film then is allowed to run until the task has been completed. At this point, the film is paused again and the rewards, grouping, evaluation, and time components are coded. Following the coding of the tasks in a lesson, the proportions for each component coded as task, ego, or neutral are calculated for each unit by lesson.

## Coding and Inter- and Intraobserver Reliability

The first author coded the 20 filmed lessons. The order of their coding was random. Observer training consisted of studying the components of the PECAI and coding practice films that were not data from this study.

Prior to coding, inter- and intraobserver reliability were established following the protocol described by van der Mars (1989). The second author established reliability with the PECAI prior to this study (Curtner-Smith & Todorovich, 2002; Todorovich & Curtner-Smith, 2003). The interobserver reliability check involved the first and second authors coding a filmed lesson, which was not part of this study's data set, designated as the "reliability lesson." These codings were conducted independently. Interobserver agreement was computed by using event-by-event comparisons of TARGET components. Specifically, the number of agreements between the two coders were divided by the number of agreements plus the number of disagreements and multiplied by 100. This process continued until an agreement level of 80.30% was achieved.

The intraobserver reliability check involved the first author recoding the reliability lesson 7 days after establishing interobserver reliability. At this time, the first author's first and second coding of the reliability lesson were compared and yielded an agreement level of 87.88%.

To check for observer drift, further intraobserver reliability checks were made following the coding of the fifth, tenth, and fifteenth lessons. This involved the author comparing a further coding of the reliability lesson with the original. Results of these checks yielded agreement levels of 84.85%, 81.82%, and 84.85%, respectively.

Finally, after all lessons in the study were coded, additional intraobserver reliability checks were made by recoding three randomly selected lessons from the study and the reliability lesson for a fifth time. Reliability percentages resulting from these checks were 89.58%, 100.00%, 100.00%, and 83.33%, respectively.

## Data Analysis

To determine the motivational climate created during the SE season and the MA unit, and to enable descriptive comparisons at the lesson and unit level, the first step was to compute the percentages of ego, task, and neutral codings for each TARGET component and in total for individual lessons. The second step was to calculate the mean percentages of ego, task, and neutral codings across the lessons of each unit for the TARGET components and in total. Lesson-by-lesson profiles of climate production within each unit were plotted. The two units were compared further at the unit level by determining whether the task codings in total differed significantly by employing a chi-square test for independence.

## Results

### Climates Created Within the MA and SE Units

**MA unit.** As shown in Table 4, coding of the MA unit indicated that the climate the two pre-service teachers created was ego involving. The mean percentage of ego codings across the 10-lesson unit was 83.64%. Conversely, the mean percentages of task and neutral codings were 4.63% and 11.73%, respectively. Moreover, Table 4 reveals that the mean percentage of ego codings across all lessons for the MA unit for each TARGET component ranged from 50.00% to 100.00%, and the mean percentage of task codings ranged from 0.00% to 12.96% and the mean percentage of neutral codings ranged from 0.00% to 46.30%.

**SE unit.** Table 4 reveals the two pre-service teachers also created an ego-involving climate within the SE unit. The mean percentage of ego codings across all lessons of the SE unit in total was 87.88%, and the mean percentages of task and neutral codings were 2.02% and 10.10%, respectively. In addition, the mean percentage of ego codings across all lessons in this unit for each TARGET component ranged from 38.89% to 61.11%, and the mean percentage of task codings ranged from 0.00% to 5.56% and the mean percentage of neutral codings ranged from 0.00% to 22.22%.

**Table 4**
*Mean Percentages of Task, Ego, and Neutral Codings Across the Multi-Activity and Sport Education Units in Total and for Each TARGET Component*

| TARGET Component | Multiple-activity unit | | | Sport education unit | | |
|---|---|---|---|---|---|---|
| | Task | Ego | Neutral | Task | Ego | Neutral |
| Task | 0.00 | 100.00 | 0.00 | 0.00 | 100.00 | 0.00 |
| Authority | 0.00 | 100.00 | 0.00 | 0.00 | 100.00 | 0.00 |
| Rewards | 12.96 | 62.96 | 24.07 | 9.09 | 69.70 | 21.21 |
| Grouping | 0.00 | 100.00 | 0.00 | 0.00 | 100.00 | 0.00 |
| Evaluation | 3.70 | 50.00 | 46.30 | 0.00 | 63.64 | 36.36 |
| Time | 11.11 | 88.89 | 0.00 | 3.03 | 93.94 | 3.03 |
| **Total** | **4.63** | **83.64** | **11.73** | **2.02** | **87.88** | **10.10** |

### Comparison of the MA and SE Units

The data displayed in Table 4 suggest that the pre-service teachers created ego-involving climates of similar strength within the MA and SE units. The chi-square test for independence supported this conclusion. It indicated no significant difference between the climates y the pre-service teachers created in either unit, $\chi^2$ ($z$, $n$ = 517) = 2.85, $p$ = .240. The lesson-by-lesson plots for the MA and SE units, shown in Tables 1 and 2, also indicate that the pre-service teachers created similar climates while working within both curriculum models. Moreover, Figure 1 reveals that the ego-involving climate within the MA unit was at its strongest during Lessons 7 and 8 when students spent the highest proportion of time engaged in competitive game play. Similarly, Figure 2 reveals that the ego-involving climate in the SE unit gained strength as the students moved into the competitive phase of their soccer season, particularly during Lessons 8 and 9.

## Summary, Discussion, and Conclusions

The purpose of this study was to describe and compare the actual or objective motivational climates teachers create within MA and SE curriculum models. The aim was to determine whether (a) different climates were created within the two units employing the two models and (b) the climate created in SE was superior (i.e., task involving) to that created in MA teaching (ego involving). The main findings were that similar climates were created within the MA and SE units and that these climates were strongly ego involving.

Given the direct and traditional pedagogies employed during MA teaching, it was not a surprise that the objective climate of the MA unit was found to be ego involving. That the objective climate of the SE unit was found to be ego involving, however, was somewhat unexpected and in contrast to the results of the studies conducted by Wallhead and Ntoumanis (2004) and Spittle and Byrne (2009). Wallhead and Ntoumanis found that students' perceptions of increased enjoyment and effort during an SE unit were associated with their increased perceptions of a task-involving climate, and Spittle and Byrne found that students' levels of perceived competence and their perceptions of a task-involving climate were maintained during SE units but not during MA units. Both sets of researchers speculated that the SE model's apparent superiority over the MA model, in terms of promoting or maintaining perceived enjoyment, effort, and competence, was due to it being inherently more task involving.

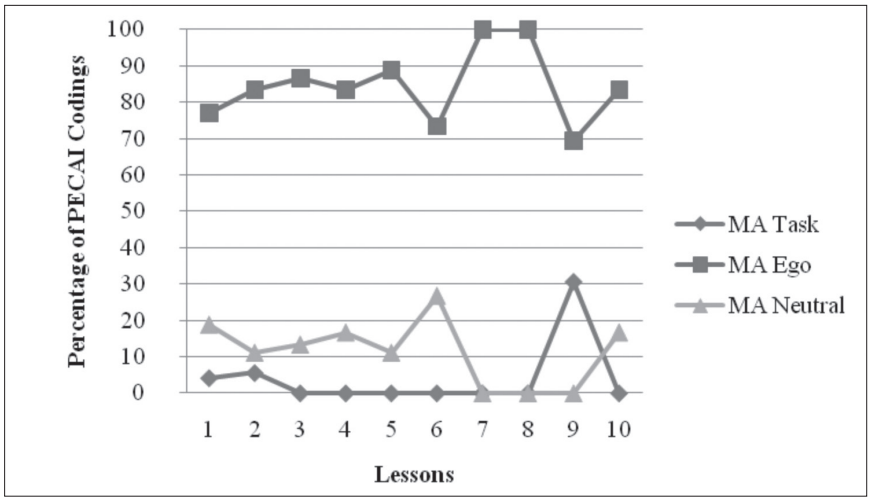


***Figure 1.*** Percentage of task, ego, and neutral codings in total during the multi-activity unit.

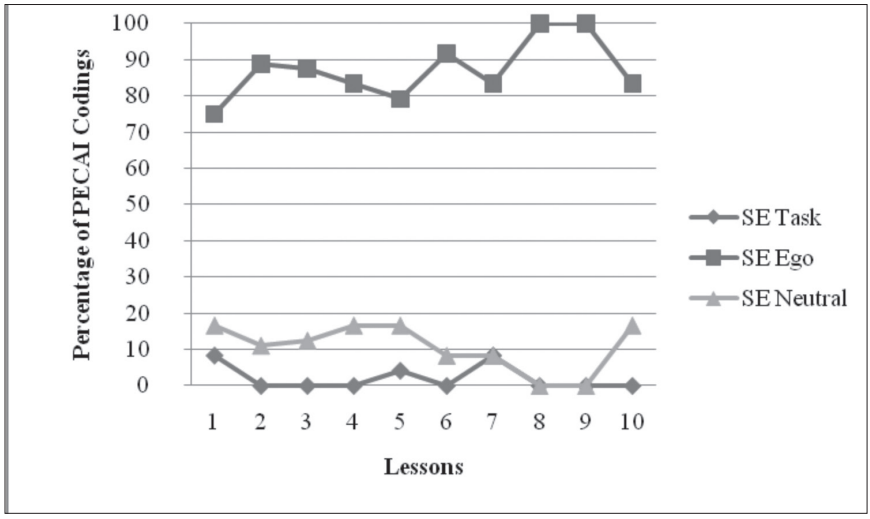


***Figure 2.*** Percentage of task, ego, and neutral codings in total during the sport education unit.

Two key questions emanating from the results of the current study are (a) why was the climate of the SE unit so strongly ego-involving, and (b) did the strong ego-involving climate created in the SE unit negate potential positive impacts on students, as previous research (Spittle & Byrne, 2009; Wallhead & Ntoumanis, 2004) has suggested? These questions go beyond the scope of the data

generated in the current study but should form the basis for further research. However, logical speculation may aid and inform these future investigations.

Following Wallhead and Ntoumanis (2004), one possible reason for the climate created in the SE unit being strongly ego involving is that, as did pre-service teachers studied in the past (see Curtner-Smith, Hastie, & Kinchin, 2008), pre-service teachers in the current study overemphasized the competitive sport elements of the model. This is likely considering that both pre-service teachers had particularly strong backgrounds in and had been socialized through competitive sport. In addition, the content of the two units (see Tables 1 and 2), which was prescribed to the pre-service teachers as part of the methods course, may have influenced the climate. SE is a competition-based model (Siedentop et al., 2011), and altering the competitive aspect of the MA unit may have skewed the results, giving a false result. Alternatively, when teachers create authentic sporting experiences in which students engage, which is the core of SE, it is impossible for them not to create an ego-involving climate as well. Further research that examines the degree to which different "readings" (Gore, 1990), interpretations, and deliveries of "real" or "proper" SE are possible will help answer this question.

Regardless of which of the alternative answers to the first question is correct, based on anecdotal evidence (i.e., observations of students by the first author and pre-service teachers' testimony), the tentative answer to the second question is that students taught within the SE unit appeared to be much more motivated and willing to participate in physical education than those within the MA model. In short, despite the strong ego-involving climate, the SE unit appeared to have positive effects on students' enthusiasm and effort. Perhaps the ego-involving climate corresponded with the students' preexisting orientation given they are middle school level and at their age are becoming self-aware of their skill limitations despite their best efforts to surpass them. If correct, this suggests that successful SE has more to do with its authenticity, excitement, and curricular scaffolding than its climate. Moreover, this line of thinking lends support to those who have argued that ego-involving climates may lead to positive gains for students in some contexts (e.g., Hidi and Harackiewicz, 2000; Steinberg, 1996; Steinberg & Maurer, 1999). Research of SE that includes measures of students' learning and experiences and of the objective motivational climate would provide a more definitive answer to this question.

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