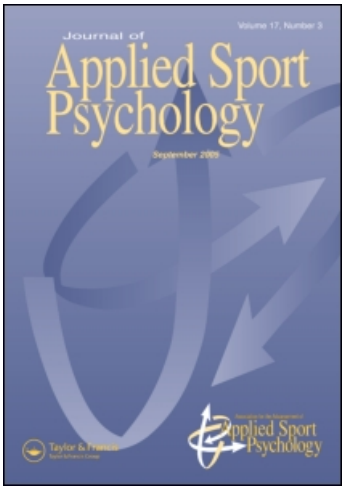

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The effect of task structure, perceived motivational climate and goal orientations on students' task involvement and anxiety

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The Effect of Task Structure, Perceived Motivational Climate and Goal Orientations on Students' Task Involvement and Anxiety

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This study examined the effect of task structure, perceived motivational climate, and goal orientations on students' task involvement and anxiety in the physical education lesson. Two hundred thirty-nine junior high school students participated in a physical education lesson comprised of four task-involving tasks and in a physical education lesson consisting of three ego-involving tasks. After the completion of each task the students responded on a questionnaire measuring concentration, autotelic experience, and loss of self-consciousness. In the last part of the lessons the students completed instruments assessing anxiety and perceived motivational climate. In the lesson comprised of task-involving tasks the students had higher state self-confidence, lower somatic anxiety, and perceived a higher task-involving and a lower ego-involving climate than in the lesson consisting of the ego-involving tasks. In both lessons, task orientation and the perception of a task-involving climate were positive predictors of concentration, autotelic experience, and loss of self-consciousness. The results are discussed with regard to the effect of task structure on the perceived motivational climate, task-involvement, and anxiety.

The selection of appropriate tasks and learning activities for students and athletes is an important duty for physical educators and coaches. Tasks should challenge students and athletes so as to maximize their effort in the learning or training process. Indeed, sport psychologists argue that the design of tasks is an important component of the environment in exercise and sport settings that ultimately affects participants' motivation (Treasure & Roberts, 1995). The present study examined the effects of different tasks and learning activities on students' perceptions of the physical education class environment. Then, the study went on with the in-

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vestigation of the effects of perceived motivational climate and goal orientations on students' task involvement and anxiety.

Recent research has indicated that goal perspective theory explains people's achievement behaviors in physical education and sport by taking into consideration both contextual and individual differences (Duda, 1996; Roberts, 1992). Goal perspective theory postulates that in achievement contexts like physical education two major goals predominate (Nicholls, 1989). When an ego goal is salient children are concerned with how able they are at the particular task. Success is defined as doing better than others and normative criteria of evaluation are adopted. Students try to exhibit high ability in a normative sense. They try to beat others, achieve a high normative performance, or claim success with little effort. They feel successful and satisfied when they show evidence of high ability but experience failure and negative emotion when their abilities are evaluated as lower than others. Trying to avoid the appearance of incompetence results in task evasion, withdrawal, or low effort as an excuse for failure.

A task goal implies a major concern with personal development. Success means improvement of personal competence. Individuals try hard to develop their skills and to learn new skills, conceive effort as the major cause of success, and feel satisfied when they improve their competence. Subjective failure is less likely due to the controllability of one's effort and mistakes are considered indispensable to the learning process.

Goal perspectives vary as a function of individual differences and situational demands (Duda, 1996). Research has established that individual differences exist in task and ego orientation and these two constructs are orthogonal (Nicholls, 1989). Duda (1996) reviewed several studies in the contexts of physical activity showing that task orientation is positively associated with children's motivation but ego orientation is not.

Ames and Archer (1988) focused their research on contextual differences in goal perspectives. Following this tradition, Seifriz, Duda, and Chi (1992) developed an instrument assessing athletes' perceptions of the motivational climate in their teams. In other words, the degree to which the team climate is deemed by the athletes as more or less task- and/or ego-involving. A similar instrument was also developed in the context of physical education (Papaioannou, 1994). Investigations have established that the perception of a task-involving physical education lesson is linked with skill improvement, intrinsic interest in the activity, positive attitudes towards exercise and towards the teacher, intentions for active involvement and high effort, attributions of success to effort, and preference for challenging tasks (Boon, 1995; Goudas & Biddle, 1994; Papaioannou, 1995; Solmon, 1996; Treasure, 1993). No study has reported a positive relationship between the perception of an ego-involving climate and an adaptive motivational pattern.

Recently, researchers have effectively manipulated the motivational climate in the physical education lesson (Boone, 1995; Solmon, 1996; Theeboom, De Knop, & Weiss, 1995; Treasure, 1993). All of these investigations created a task-involving or ego-involving climate by intervening

on six structures of the class climate: task, authority, recognition, grouping, evaluation, and time. For example, in the task-involving climate tasks are assigned according to students' ability, students can choose the tasks they want to learn, teachers reward effort, students work individually, teachers stress self-referenced criteria of evaluation, and distribute equal instructional time across groups. In the ego-involving climate, teachers reward ability, stress normative criteria of evaluation, emphasize competition, make all the decisions, interact more often with high ability students, etc. These studies are very important because they offer specific teaching instructions on how to create a positive motivational climate for the students.

The present study continues this line of inquiry by manipulating the task structure of the physical education lesson. Unlike the previous intervention studies that manipulated all structures of the motivational climate, the present study changed only one structure. This research design will help to clarify whether the change of one structure of the lesson is enough to affect the motivational climate of the lesson. Certainly, an attempt to manipulate the task structure of the lesson can affect some other structures as well. Nevertheless, the teachers participating in the current investigation were instructed to change just the task structure of the lesson. No attempt was made to change other structures of the class climate.

Another difference between the present and several past intervention studies was the length of the manipulation. In some previous studies the intervention lasted several weeks (Lloyd & Fox, 1993; Theeboom et al., 1995). In this study we followed a procedure similar to that of Solmon (1996) by manipulating two academic hours. In the first hour task-involving activities were used. Two weeks later the same students participated in a lesson consisted of ego-involving tasks. This allows one to see whether a short manipulation of the task structure affects students' perceptions of the motivational climate in their classes. This short intervention did not create the permanent motivational climate of typical physical education classes. It created the particular climate for these two academic hours. Solmon (1996) found that such a short intervention affected the perceptions of students of the motivational climate in their classes. In the current study it was assumed that the students would discern a different motivational climate between the two lessons due to the different task structure.

Tasks were classified as ego-involving and task-involving taking into consideration the work of Zimmerman and Kitsantas (1996) and Ames (1984). Zimmerman and Kitsantas (1996) suggested that in the physical activity context goals could be distinguished as process and product. When children set a *process* goal they try to perform the correct movement pattern of a skill. When they set a *product* goal they try to achieve an outcome which is usually expressed in numbers. Process goals such as performing a skill correctly help students to improve themselves and should be considered as conducive to a task-involving climate. On the other hand, based on the analysis of Ames (1984), product goals can be

classified as either competitive, cooperative, or personal development goals. Trying to overcome others is a competitive goal. A cooperative goal is set when students try to keep the ball in the air for ten consecutive overhead sets. Finally, students set a personal development goal when they are trying to improve their performance from two out of five free shots in basketball to three out of five. One can expect that teachers setting competitive goals create an ego-involving atmosphere but teachers setting cooperative or personal development goals shape a task-involving environment. It was assumed that tasks incorporating process or cooperative goals would create an atmosphere that would be perceived as task involving. On the other hand, students would perceive a lesson as ego involving if it included tasks asking children to compete against each other.

The present study was conducted in Greece. Past findings imply that Greek males perceive the environment of their physical education classes as more ego involving than females (Papaioannou, 1992). This concerns the climate of the every day lesson. In the present investigation we were interested to examine whether this finding will emerge after the intervention in the goal structure of the lesson. The nature of this investigation was exploratory and no hypothesis was formulated with regard to gender differences.

Silverman and Skonie (1997) highlighted the need to use criterion variables in research on teaching in physical education, that is, to examine the effect of teaching on students' learning, attitudes, or fitness. In the present study the effect of task structure on students' task-involvement and anxiety were examined. At the time that this study was conducted there was no published scale measuring task-involvement in physical activity. Hence, three scales of the Flow State Scale (FSS) developed by Jackson and Marsh (1996) were used: Concentration, Autotelic Experience, and Loss of Self-Consciousness. This is in line with goal perspective literature (e.g., Nicholls, 1989) suggesting that task-involved students are concentrated, intrinsically motivated, and sometimes experience loss of self-consciousness. Needless to say the use of an instrument which is not specifically designed to assess task involvement is a methodological shortcoming of the present study.

It was predicted that students would be more actively involved and would report higher levels of concentration, autotelic experience, loss of self-consciousness, and less anxiety in the lesson comprised of task-involving activities than in the lesson consisted of ego-involving tasks. These assumptions were based on theory suggesting that task-involved individuals experience learning as an end in itself (Nicholls, 1989) and research showing that the perception of a task-involving physical education lesson is positively related to students' intrinsic interest and preference for challenge (Duda, 1996; Papaioannou, 1995). The highly evaluative environment of the lesson consisting of ego-involving tasks should increase concerns about failure and anxiety and findings in the sport con-

text support this argument (Pensgard & Roberts, 1997; Walling, Duda, & Chi, 1993).

Research showed greater within-class than between-classes variability in how students perceive the environment (Ryan & Grolnick, 1986; Papaioannou, 1994). This within-class variability in students' perceptions of the motivational climate can be partly explained by individual differences in goal orientations (Papaioannou, 1992). Hence, it was decided to add both goal orientations and perceived motivation climate to the equation predicting the task-involvement and anxiety of participants. Theory (Nicholls, 1989) and research in physical activity contexts (Duda, 1996) implies that task orientation and perceptions of a task-involving climate leads to higher levels of task-involvement and lower levels of anxiety. Accordingly, it was expected that irrespective of the goal structure of the lesson, task orientation, and perceptions of a task-involving climate would be positive predictors of task-involvement. Moreover, a strong task orientation and the perception of a high task-involving climate would decrease the anxiety of students participating in the lesson consisted of ego-involving tasks.

METHOD

Participants

Two hundred thirty-nine students (N = 131 males, N = 108 females) aged M = 13 (SD ± 0.5) participated in the study. They were involved in 10 physical education classes in junior high schools in Komotini, Greece. These classes were taught by five physical education teachers, two classes from each teacher. Both students and teachers agreed to take part in the study.

Design and Procedure

Selection of the tasks. One of the authors visited 20 experienced physical education teachers and explained to them the nature of task-involving and ego-involving activities. She told them that the authors were investigating the relationship between students' motivation and learning activities in the physical education lesson. Then she developed the theoretical grounds of the research. She explained that a task-involving activity absorbs students' attention and makes them want to practice more but an ego-involving activity makes students wonder how competent they are in comparison with the others. To make sure that the teachers realized what is a task-involving and an ego-involving activity, she offered examples of such activities in the physical education lesson and she elaborated why students facing these activities are task- or ego-involved, respectively.

Then she asked them to describe some task-involving and some ego-involving activities that they regularly use in their teaching. In total, the teachers described 67 task-involving and 65 ego-involving activities. Afterwards, two experts on goal perspective theory ranked these activities

as more and less task- and ego-involving, respectively. Each specialist ranked the activities without knowing the other's opinion.[1]

All the selected tasks were volleyball drills. Four task-involving and three ego-involving drills were chosen. The task-involving drills were as follows: (a) two by two, volley overhead sets, the goal was to keep the ball in the air for 20 consecutive passes, (b) two by two, volley overhead sets, the goal was to set passes using the proper technique, (c) two by two, volley forearm passes, the goal was to keep the ball in the air for 10 consecutive passes, (d) two by two, volley forearm passes; the goal was to bump the ball using the proper technique. In all cases the students adjusted the distance between each other by themselves. One can realize that cooperative goals were assigned in the first and third drill and process goals in the second and fourth drill. According to theoretical predictions, these goals should be considered task-involving.

The ego-involving drills were as follows: (a) two by two, each child sets overhead passes to him/herself, the goal was to overcome each other, (b) each child serves three consecutive times, the goal was to perform more successful serves than the others, (c) each child serves three consecutive times while two children are playing defense, the goal was to score the most points from serves or defence.

Experimental procedure. One of the authors visited the schools and administered the TEOSQ (described below) six months after the beginning of the academic year. All students responded on this instrument in a classroom setting. Children worked quietly on their own, but those who wanted to ask questions could raise their hand and communicate privately with the researcher.

The experimenter asked the physical education teachers to prepare a 45 minute lesson using the four task-involving volleyball drills and a 45 minute lesson using the three ego-involving volleyball drills. Moreover, she explained to them the experimental procedure. The teachers confirmed that their students were quite familiar with the volleyball drills of setting and serving because they had already practiced them in the first semester. Each school had two volleyball courts, so during the drill of serving four children could serve almost simultaneously.

A few days later the experimenter visited the schools again and completed the first phase of the experiment. The structure of the task-involving lesson was as follows: After a three minute warm up the first task-involving drill took place lasting for about 5 minutes and then the children responded on the Task Involvement questionnaire (described below). Completion of the Task Involvement questionnaire required about 1 minute. Then the second drill occurred (5 minutes) and immediately afterwards the children responded again on the Task Involvement questionnaire. Then the third drill took place (5 minutes) followed by the com-

[1] We are grateful to Dr. Marios Goudas for his help in the selection process of the activities used in this study.

pletion of the Task Involvement instrument and finally the fourth drill occurred (5 minutes) followed by the completion of the questionnaires measuring task involvement, anxiety, and perceptions of the motivational climate (described below). One may observe that the start and stop nature of the lesson distracts students' concentration and does not help them to maximize their task-involvement. On the other hand, this start and stop nature of the lesson is quite typical for physical education lessons requiring students to keep notes and use criteria sheets before or after the completion of a movement task (Mosston & Asworth, 1986).

Two weeks later the students participated in the lesson consisting of the three ego-involving tasks. This lesson had the following structure: After a three minute warm-up the first ego-involving drill took place lasting for 5 minutes and then the children completed the Task Involvement instrument. Then the second drill occurred (7 minutes) followed by the completion of the Task Involvement questionnaire and finally the third drill took place (8 minutes) followed by the completion of the instruments measuring Task Involvement, anxiety, and perceived motivational climate. All the students participated in both the task-involving and ego-involving lesson. In both lessons the teacher introduced the tasks and left the students experience the practice process. Students were familiar with the drills so they could work alone. Teachers made no comments and evaluations in order to avoid a possible impact on other structures of the lesson.

Measures

Perceived motivational climate questionnaire. The perceptions of students of the motivational climate of the lesson were measured with a modification of the Learning and Performance Orientations in Physical Education Questionnaire (LAPOPECQ). This instrument was developed by Papaioannou (1994). Results from confirmatory factor analysis suggested that this questionnaire has an hierarchical structure: (a) two higher-order factors measuring perceptions of learning and performance goals,[2] and (b) five lower-order factors, two of them subfactors of the learning-oriented higher-order factor (they are named Teacher-Initiated Learning Orientation and Students' Learning Orientation) and the remaining three subfactors of the performance-oriented factor (they are called Students' Competitive Orientation, Outcome Orientation Without Effort and Students' Worries About Mistakes). Responses to 27 items following the stem "In this physical education class" were indicated on a 5-point Likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). This instrument has been used several times in Greece showing that is

[2] The terms *perceptions of learning goals* and *perceptions of performance goals* derived from the work of Dweck and Legget (1998) and in this study are used synonymously with *perceptions of task-involving goals* and *perceptions of ego-involving goals* respectively.

both reliable and valid (Papaioannou, 1995; Papaioannou & Diggelidis, 1997).

In the present study the stem was modified to "Today, in the physical education lesson. . ." and the items were used in the past. For example, one of the items of the Teacher-Initiated Learning Orientation scale was "the teacher was completely satisfied when every student's skills were improving," one item of the Students' Learning Orientation scale was "we felt very satisfied because we learned new skills and games," one item of the Students' Competitive Orientation was "during the lesson the students were trying to outperform each other," one item of the Outcome Orientation Without Effort scale was "the students felt most satisfied when they were winning with little effort" and one item of the Students' Worries About Mistakes scale was "students worried about failure in performing skills because it would lead to the disapproval of others."

In addition to the aforementioned three performance-oriented scales, the scale "Teacher-Initiated Competitive Orientation" was also used. This scale was developed more recently (Papaioannou, 1997a) in order to have a quick measurement of the performance-oriented climate in physical education. Recent results from different data bases showed that this and the Teacher-Initiated Learning Orientation scale comprise a stable and valid tool for a quick measurement of the perceived motivational climate in physical education. The items of this scale were "the teacher attended the best records only," "the students were encouraged to play better than their schoolmates," "the teacher praised the students only when they were better than their schoolmates," "only the students with the best records were rewarded," "the teacher praised the students when they outperformed their schoolmates," and "the teacher boosted the competition among the students."

In the lessons consisting of ego-involving and task-involving activities respectively, the α reliability of the Teacher-Initiated Learning Orientation scale was .72 and .71, the α of the Students' Learning Orientation scale was .79 and .79, for the Students' Competitive Orientation scale $\alpha = .72$ and $\alpha = .64$, for the Outcome Orientation Without Effort the α was .71 and .63, the α of the Students' Worries About Mistakes scale was .77 and .70 and the α of the Teacher-Initiated Competitive Orientation scale was .82 and .77.

Anxiety. The Competitive State Anxiety Inventory 2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1990) which was adapted in the Greek population by Kakkos and Zervas (1993), was used. This consists of three factors measuring somatic anxiety, cognitive anxiety, and self-confidence. More recently Kakkos and Zervas (1995; 1996) argued that using it with Greek athletes, a 15-item version of this instrument led to more reliable and valid results. The excluded items were the items number 1 to 6, 13, 14, 23, and 25 in the Martens et al. (1990) scale. This 15-item version proposed by Kakkos and Zervas (1995; 1996) was used for time-saving reasons too. Following the stem "During the drills that we did today. . ." the students responded on the items on a 4-point Likert-type scale ranging

from 1 (*Not at All*) to 4 (*Very Much*). In the ego- and task-involving lesson respectively, the α reliability of the Somatic Anxiety scale was .74 and .66, for the Cognitive Anxiety scale the α was .74 and .71, and for the Self-Confidence scale, α = .78 and .75.

Task-involvement. Three scales of the Flow State Scale (FSS) developed by Jackson and Marsh (1996) were used: Concentration, Autotelic Experience, and Loss of Self-Consciousness. Stavrou, Zervas, Kakkos, Psichountaki, and Georgiadis (1996) translated the FSS into Greek and reported findings supporting its validity and reliability. Immediately after each drill and following the stem "Think about the drill that you just did" the students responded on the 12 items of the three scales of the FSS on a 5-point Likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

Results from factor and reliability analyses led to the exclusion of the item "It was no effort to keep my mind on what was happening" from the Concentration scale. In the task-involving lesson the α reliability of the Concentration scale was .65, .75, .77, and .81, the α reliability of the Autotelic Experience scale was .66, .80, .86, and .87 and for the Loss of Self-Consciousness scale the α was .68, .70, .82, and .87. In the ego-involving lesson, the reliability α was .67, .77, and .78 for the Concentration scale, α = .81, α = .81, and α = .81 for the Autotelic Experience scale and α = .76, α = .81, and α = .81 for the Loss of Self-Consciousness scale.

Task and ego orientation. The Task and Ego Orientation in Sport Questionnaire (TEOSQ) was used. This instrument was developed by Duda and Nicholls (1992) and was adapted in Greek physical education by Papaioannou and Macdonald (1993). This instrument has been used in Greek physical education several times, indicating that is both reliable and valid (Papaioannou & Theodorakis, 1996; Papaioannou & Diggelidis, 1997). Following the stem "I feel most successful in the physical education lesson. . ." students responded on the thirteen items of this instrument on a scale rating from 5 (*Strongly Agree*) to 1 (*Strongly Disagree*). The Task scale consists of seven items, for example "when I learn a new skill and this makes me practice more" and the Ego scale comprises six items, for example "I can do better than my friends." In this study the reliability α for the Ego scale was .85 and for the Task scale was .70.

RESULTS

Effects of Task Structure and Gender Differences

Perceived motivational climate. A doubly multivariate repeated measures design was conducted to examine differences in the six scale scores of the perceived motivational climate questionnaire between the lesson consisting of the task-involving tasks and the lesson comprised of the ego-involving tasks. The gender of students was used as a between-subjects factor. The results revealed a main within-subjects effect for the lesson, Wilks's $\Lambda = .65$, $F(6,204) = 18.7$, $p < .001$ and a main between-

Table 1

Differences in the scales of the perceived motivational climate questionnaire, somatic anxiety and state self-confidence between the two lessons

Scales	Lesson with task-involving tasks		Lesson with ego-involving tasks		t-value
	M	SD	*M*	SD	
Teacher-initiated learning orientation	24.9	3.9	23.1	4.1	6.0***
Student's learning orientation	27.5	5.1	26.4	5.2	3.1**
Teacher-initiated competitive orientation	13.9	4.7	16.6	4.9	7.6***
Students' competitive orientation	16.2	4.3	17.9	4.2	5.5***
Students' worries about mistakes	15.8	4.3	17.8	4.2	5.7***
Outcome orientation without effort	12.9	3.7	13.8	3.6	2.8**
Somatic anxiety	6.7	2.6	7.7	3.0	4.5***
State self-confidence	13.9	3.7	12.6	4.0	4.4***

Note. *** $p < .001$, ** $p < .01$.

subjects effect for the gender of students, Wilks's $\Lambda = .85$, F (6,204) = 5.95, $p < .001$. No significant interactions emerged.

Follow-up univariate analyses revealed that in the lesson comprised of the task-involving tasks the students perceived that their teacher and schoolmates gave stronger emphasis on learning than in the lesson containing the ego-involving tasks (Table 1). On the contrary, the students reckoned that in the lesson containing the ego-involving tasks the teacher gave stronger emphasis on competition, there was a higher outcome-orientation without effort in the lesson, and the students were more competitive-oriented and more worried about mistakes than in the lesson including the task-involving tasks.

In the lesson containing the ego-involving tasks the boys perceived the climate as more ego-involving than the girls (Table 2). The boys scored higher in the perceptions "teacher-initiated competitive orientation," "students' competitive orientation," "students' worries about mistakes," "outcome orientation without effort" than the girls. In the lesson consisting of the task-involving tasks the boys perceived their teacher and schoolmates to put more emphasis on competition than the girls. These differences concur with the finding that boys ($M = 3.14$, SD = .86) were more ego-oriented than girls ($M = 2.66$, SD = .93), $t(230) = 4.1$, $p < .001$.

Anxiety. A doubly multivariate repeated measures analysis was conducted to examine the effect of the lesson on somatic anxiety, cognitive anxiety, and state self-confidence. The gender of students was the between-subjects factor. The results showed a main within-subjects effect for the lesson, Wilks's $\Lambda = .83$, F (3,208) = 14.0, $p < .001$. No gender differences or significant interactions emerged.

Table 2
Differences in the scales of the perceived motivational climate questionnaire between boys and girls

	Lesson with task-involving tasks				
	BOYS		GIRLS		
Scales	*M*	SD	*M*	SD	*t*-value
Teacher-initiated learning orientation	24.4	3.9	25.4	3.8	1.9
Students' learning orientation	27.4	5.0	27.7	5.2	.38
Teacher-initiated competitive orientation	15.1	4.9	12.9	4.5	3.6***
Students' competitive orientation	16.9	4.4	15.3	4.0	3.0**
Students' worries about mistakes	15.9	4.2	15.7	4.4	.40
Outcome orientation without effort	13.2	3.8	12.7	3.5	1.1
	Lesson with ego-involving tasks				
	BOYS		GIRLS		
Scales	*M*	SD	*M*	SD	*t-value*
Teacher-initiated learning orientation	22.7	3.8	23.6	4.2	1.6
Students' learning orientation	26.2	4.9	26.5	5.3	.35
Teacher-initiated competitive orientation	17.8	4.4	15.0	5.1	4.5***
Students' competitive orientation	19.1	3.7	16.4	4.3	4.9***
Students' worries about mistakes	18.7	4.0	16.3	4.1	4.4***
Outcome orientation without effort	14.3	3.1	13.0	3.9	2.7**

Note. *** $p < .001$, ** $p < .01$.

Follow-up univariate analyses revealed that in the lesson containing the ego-involving tasks the students reported higher somatic anxiety and lower state self-confidence than in the lesson consisting of the ego-involving tasks (see Table 1). No difference emerged with regard to cognitive anxiety.

Task involvement. Repeated measures analysis of variance was conducted in order to examine differences in students' concentration during their involvement in the seven tasks. Gender was used as the between-subjects independent variable. A within-subjects main effect emerged, F (6, 1260) = 4.79, $p < .001$. Students reported the higher concentration when they were involved in the task "volley overhead sets; the goal was to use the proper technique" and the lower concentration when they participated in the task "volley forearm passes; the goal was to use the proper technique" (see Table 3). No gender differences or significant interactions emerged.

Repeated measures analysis of variance was also conducted using autotelic experience as the dependent variable, task-structure as the within-subjects factor, and gender as the between-subjects independent variable. The results revealed a within-subjects main effects for task-structure, F (6, 1260) = 11.09, $p < .001$, and a significant interaction between task-

Table 3

Means and standard deviations for the scores of boys and girls on the concentration and autotelic experience scales during their involvement in the seven tasks

	Concentration				Autotelic Experience			
	BOYS		GIRLS		BOYS		GIRLS	
	M	SD	*M*	SD	*M*	SD	*M*	SD
Two by two, volley overhead sets, the goal was to keep the ball in the air for 20 consecutive passes	12.3	2.4	12.6	2.0	15.6	2.8	16.1	2.6
Two by two, volley overhead sets, the goal was to use the proper technique	12.7	2.5	13.2	2.0	15.7	3.0	16.3	3.1
Two by two, volley forearm passes, the goal was to keep the ball in the air for 10 consecutive passes	12.4	2.3	12.3	2.5	15.4	3.5	14.4	4.4
Two by two, volley forearm passes, the goal was to use the proper technique	12.1	2.7	12.2	2.8	15.2	3.7	13.9	4.6
Two by two, each child sets overhead passes to him/herself, the goal was to overcome each other	12.4	2.3	12.5	2.4	15.8	3.2	15.3	3.4
Each child serves three consecutive times, the goal was to perform more successful serves than the others	12.6	2.2	12.3	2.4	15.7	3.0	15.3	3.8
Each child serves three consecutive times while two children are playing defense, the goal was to score the most points from serves or defense	12.3	2.4	12.3	2.5	15.6	3.3	15.2	3.9

structure and gender, F (6, 1260) = 4.56, $p < .001$. Females reported higher levels of autotelic experience when they were involved in the two task-involving activities pertaining to overhead sets and lower levels of autotelic experience when they participated in the two task-involving activities concerning the forearm passes (see Table 3).

Finally, using Loss of Self-Consciousness as the dependent variable, repeated measures analysis of variance revealed no within-subjects effects for task structure, no between-subjects effects for gender, neither significant interactions.

Effects of Individual Differences

Task involvement. The sum of the four Concentration scale scores in the lesson consisted of the task-involving tasks comprised the total Concentration score during task-involvement. Similar procedure was followed in order to compute the total Autotelic Experience and the total Loss of Self-Consciousness scores during task-involvement. The total Concentration score during ego-involvement was the sum of the three Concentration scale scores in the lesson containing the ego-involving tasks. A similar procedure was followed in order to compute the total Autotelic Experience score and the total Loss of Self-Consciousness score during ego-involvement.

Each of these six new variables were hierarchically regressed on four predictors which were added to the equation in the following order: (a) ego orientation and task orientation, (b) perceived teacher-initiated competitive orientation and perceived teacher-initiated learning orientation. We did not add to the equation the remaining four scales of the LAPO-PECQ because according to Duda and Whitehead (1998) they capture both the perceptions of students of the goal structure operating in the physical education classes and their personal goal orientations. In initial analyses we added to the equation the interactions among task orientation and ego orientation. However, no interaction added significantly to prediction of the dependent variables. Hence, in the following analyses the interactions were excluded.

As shown in Table 4, for both task-involving and ego-involving lessons, task orientation, and the perception of a teacher who emphasizes learning contributed substantially to prediction of concentration, autotelic experience, and loss of self-consciousness. The β coefficients in the second step of the analyses suggest that in five out of six regression analyses, both task orientation and the perception of teacher's emphasis on learning contributed uniquely to prediction of variables implying Task Involvement.

In the lesson consisting of ego-involving tasks the perception of a teacher who emphasizes competition in the lesson was a positive predictor of concentration and autotelic experience. In the lesson comprised of task-involving tasks, the perception of teacher's emphasis on competition did not contribute to prediction of indices of Task Involvement.

Table 4

Summary of hierarchical regression analyses for variables predicting concentration autotelic experience and loss of self-consciousness

	Concentration							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.17*				.28*
Ego orientation	.01	.13	.00		.17	.14	.07	
Task orientation	1.2	.19	.41*		1.5	.19	.50*	
Step 2				.10*				.10*
Ego orientation	.02	.13	.01		−.03	.14	−.01	
Task orientation	.84	.19	.29*		1.1	.20	.37*	
Perceived teacher-initiated competitive climate	.00	.02	.01		.08	.02	.20*	
Perceived teacher-initiated learning climate	.17	.03	.34*		.15	.03	.29*	
Total R^2				.27*				.38*
	Autotelic experience							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.21*				.26*
Ego orientation	.29	.19	.10		.41	.21	.13	
Task orientation	1.8	.26	.42*		2.1	.29	.46*	
Step 2				.14*				.08*
Ego orientation	.25	.18	.08		.16	.21	−.05	
Task orientation	1.1	.25	.28*		1.5	.30	.33*	
Perceived teacher-initiated competitive climate	.03	.03	.06		.10	.04	.17*	
Perceived teacher-initiated learning climate	.29	.04	.40*		.21	.05	.27*	
Total R^2				.35*				.34*

Anxiety. Six scale scores were computed suggesting somatic anxiety, cognitive anxiety, and state self-confidence for the ego-involving and the task-involving lessons, respectively. Each of these scores were hierarchically regressed on four variables which were added to the equation in the following order: (a) ego orientation and task orientation, (b) perceived teacher-initiated competitive orientation and perceived teacher-initiated learning orientation.

Table 4
Continued

	Loss of self-consciousness							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.04*				.13*
Ego orientation	.14	.21	.05		.26	.22	.08	
Task orientation	.81	.30	.19*		1.6	.31	.33*	
Step 2				.05*				.07*
Ego orientation	.21	.22	.07		.17	.23	.05	
Task orientation	.48	.31	.11		.96	.33	.21*	
Perceived teacher-initiated competitive climate	−.03	.04	−.05		.02	.04	.03	
Perceived teacher-initiated learning climate	.16	.05	.21*		.23	.05	.29*	
Total R^2				.09*				.20*

Note. * $p < .01$.

In both task-involving and ego-involving lessons, the perception of a teacher who emphasizes learning orientation was a negative predictor of somatic anxiety (see Table 5). In the lesson consisting of task-involving activities, the perception of a teacher who emphasizes competition was a positive predictor of somatic anxiety.

Goal orientations and perceived motivational climate did not significantly predict cognitive anxiety. The perception of a teacher emphasizing learning orientation in the lesson was a positive predictor of state self-confidence in the lesson consisting of ego-involving tasks.

DISCUSSION

The present study showed that a change in the Task structure affects the perceptions of students of the motivational climate in physical education. A combination of process and cooperative goals made students perceive a higher task-involving and lower ego-involving environment than the assignment of a competitive task structure. According to expectations, the manipulation affected the perceptions of students concerning the behaviors of teachers. In the lesson consisting of task-involving activities students perceived their teachers as giving a stronger emphasis on learning and less emphasis on competition than in the lesson comprised of the ego-involving tasks. Interestingly enough, the intervention also affected the perceptions of students relating to schoolmates' behaviors and emotions (satisfaction, enjoyment, worries) and the perceptions concerning what was deemed important in the lesson. In the lesson consisting

Table 5
Summary of hierarchical regression analyses for variables predicting somatic anxiety, state self-confidence and cognitive anxiety

	Somatic anxiety							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.00				.01
Ego orientation	.22	.20	.04		.38	.23	.11	
Task orientation	.06	.28	.02		−.45	.33	−.09	
Step 2				.07*				.05*
Ego orientation	−.08	.21	−.03		.30	.24	.09	
Task orientation	32	29	.08		−.06	.35	−.01	
Perceived teacher-initiated competitive climate	.10	.04	.19*		.06	.04	.10	
Perceived teacher-initiated learning climate	−.13	.05	−.19*		−.16	.06	−.21*	
Total R^2				.07*				.06*

	Cognitive anxiety							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.00				.00
Ego orientation	−.07	.27	−.02		.13	.28	.03	
Task orientation	.34	.37	.03		−.06	.38	−.01	
Step 2				.04				.04
Ego orientation	−.34	28	−.09		−.01	.29	.08	
Task orientation	.10	.39	.02		.35	.41	.07	
Perceived teacher-initiated competitive climate	15	.05	.18		.09	.05	.13	
Perceived teacher-initiated learning climate	.01	.06	.01		−.17	.06	−.18	
Total R^2				.04				.04

of task-involving activities students perceived their schoolmates as more learning-oriented, less competitive-oriented, and less worried than in the lesson comprised of the ego-involving tasks. In addition, in the ego-involving lesson students reckoned that winning with minimal effort was more important than in the task-involving lesson. In other words, the manipulation of the task structure affected the perceptions of students referring to all structures of the motivational climate.

Table 5
Continued

	State self-confidence							
	Lesson with task-involving tasks				Lesson with ego-involving tasks			
	B	*SE B*	β	ΔR^2	*B*	*SE B*	β	ΔR^2
Step 1				.03				.02
Ego orientation	.02	.27	.01		−.25	.30	−.06	
Task orientation	.99	.37	.18		.94	.43	.16	
Step 2				.02				.05*
Ego orientation	.15	.28	.04		−.04	.32	−.01	
Task orientation	.72	.40	.13		.50	.46	.08	
Perceived teacher-initiated competitive climate	−.06	.05	−.09		−.13	.06	−.17	
Perceived teacher-initiated learning climate	.13	.07	.14		.18	.07	.19*	
Total R^2				.05				.07*

Note. * $p < .01$.

Boys perceived the climate of both lessons as more ego-involving than girls. This is in line with the finding that boys were more ego-oriented than girls. Solmon (1996) in the United States and Goudas and Biddle (1994) in Great Britain have reported similar findings. A preoccupation of males with the acquisition of status and power has been reported in Greece (Papaioannou & Macdonald, 1993; Papaioannou, 1997b) as well as in United States (Duda, 1989). The stronger emphasis of males than females on competition and acquisition of social status and power characterizes the Western civilization. This increases the aggressiveness of males (Papaioannou, 1997b), and as is discussed below, does not contribute to the enhancement of their motivation.

In the ego-involving lesson students reported higher somatic anxiety and lower state self-confidence than in the task-involving lesson. Most theories of anxiety would predict that this combination should deteriorate performance in the sport context (Edwards & Hardy, 1996). In the physical education context a combination of low state self-confidence and higher somatic anxiety might have debilitative effects upon motor skill development. Indeed, the study of Theeboom et al. (1995) showed that in a summer sport program children participating in a task-involving group exhibited better motor skills than children taking part in an ego-involving group. Certainly, the interactive effects of somatic anxiety, cognitive anxiety, and state self-confidence on motor learning in the context of physical education have yet to be examined. However, if a primary purpose of physical education is to promote positive emotional experiences for all children in order to adopt exercise as a lifestyle habit, then

a combination of low state self-confidence and high somatic anxiety should not be sought.

At a first glance the results concerning the anxiety of students seem spurious. One should expect that the highly evaluative climate of the ego-involving lesson would affect the cognitive anxiety of students. Taking into consideration that the study was conducted six months after the beginning of the academic year the results seem more reasonable. At that time students and teachers knew each other quite well. The students already knew that everybody in the class had a clear view of the others' abilities. Their status had been already established. Most probably, at that time students had nothing to prove in a typical lesson and nothing to worry about. The ego-involving goal structure increased their tension because they had to be in readiness for competition and that is why they reported higher somatic anxiety. However, it did not increase their concerns about performing poorly.

This does not imply that all students were not worried at all. The results showed that individual differences in the perceived motivational climate could have facilitative or debilitative effects on the anxiety of students. When competition was emphasized, those who perceived that their teacher was also interested in their skill development were less anxious and reported higher state self-confidence. When a teacher emphasized skill development, students perceiving that their teacher was also interested in who was the best were more likely to experience high levels of somatic anxiety. Once again, these data underscore the necessity to adopt a high task-involving climate and avoid ego-involvement. The small proportion of the explained variance could be attributed to the context. As Bain (1990) observed, the lesson of physical education is not a high achieving context like sports or mathematics. Adolescents are probably less anxious in the lesson of physical education than in other lessons of school or in competitive sports. One can assume that a stronger association between perceived motivational climate and anxiety would have emerged if this study had been conducted in the context of competitive sport. Undoubtedly, further research is needed in this area.

The results concerning task involvement suggest that more positive emotional experiences of students should be expected from a high task- and low ego-involving physical education lesson. Individual differences in task orientation and the perception of a task-involving climate were strong positive predictors of concentration and autotelic experience. Moreover, task orientation and the perception of a task-involving climate were positive predictors of loss of self-consciousness, particularly in the lesson comprised of ego-involving tasks. These findings are in line with the results of several recent investigations suggesting that task-oriented individuals are intrinsically motivated in sport and a task-involving climate facilitates intrinsic interest in physical activity (Duda, 1996).

The interesting finding here is that some tasks might not be so enjoyable and yet create a positive motivational climate. We observed that the hardness of the balls made the forearm passes painful tasks for the stu-

dents, particularly the girls. Although these tasks were listed as the less enjoyable, their process and cooperative goal structure contributed to the development of a task-involving climate. In the end, the students perceiving a stronger task-involving climate reported higher levels of concentration, enjoyment and loss of self-consciousness.

This study shows that in typical physical education lessons individual differences in personality (task orientation) and the perception of the class climate are better predictors of the optimal experience of students than contextual differences. These findings are in line with data revealing that within-class differences in the perception of the class climate are better predictors of students' motivation than between-class differences (Papaioannou, 1994; Ryan & Grolnick, 1986). Taking into consideration the results of studies showing that interventions lasting for several lessons affect the goal orientations of students (Lloyd & Fox, 1992; Solmon, 1996), we might expect that the adoption of teaching strategies aiming to create a high task-involving climate will increase the task orientation of students and will make them more prone to perceive a high task-involving climate. As this study showed, the better adaptive goal orientations and perceptions of students will result in more adaptive motivational patterns.

This has important implications for the teaching process. We should not expect to increase the motivation of students in one day. We should not select our tasks based on temporary improvements of the enjoyment of students. Some competitive tasks increase excitement at a particular moment but increase also ego-involvement and prohibit task-involvement. If we use them frequently, in the long term we will see debilitative effects on the motivation of students. When we select our tasks we should consider their effects on the motivational climate of the lesson and the long-term effects on the goals and perceptions of students. A priority on process, cooperative, and personal development goals will help to sustain a high task-involving climate, develop the positive qualities of students and increase their positive emotional experiences in the lesson of physical education.

One limitation of the present study is the short length of the intervention. A longer intervention could have stronger effects on perceived motivational climate, concentration, autotelic experience, loss of self-consciousness, and anxiety. Future research should employ longer interventions for a firm establishment of the above-mentioned conclusions and recommendations.

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