

## Impact of Motivational Climate on Students' Behaviors and Perceptions in a Physical Education Setting

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Goal theory asserts that a task-involved climate is associated with adaptive behavior patterns such as persisting in practice. Conversely, individuals in an ego-oriented climate are deemed at risk for maladaptive behaviors when they experience failure or encounter difficulty performing a task. Results of previous research have relied primarily on self-report data rather than analysis of overt behavior. This study investigated differences in students' practice behaviors and perceptions of the motivational climate in physical education classes manipulated to be task or ego involved. Results based on 109 seventh- and eighth-grade students indicated that students perceived the conditions differently. Student behavior was assessed by coding practice trials from videotapes of the classes. Individuals in the task-involved condition completed a greater number of practice trials at a difficult level than those in the ego-involved condition.

From a cognitive-mediational perspective, students are recognized as active, controlling agents in their own learning (Doyle, 1977). Through the lens of their past experience and prior knowledge, they assign meanings to events that occur in instructional settings. They make important choices concerning the ways they interact in achievement settings, such as the aspects of the class to which they attend, whether they exert effort, and whether they persist when difficulty is encountered. The decisions students make in this regard govern what they learn. Active, effortful involvement on the part of the learner is the critical link between teacher behavior and student achievement, and from this viewpoint what the student does is a more important determinant of learning than what the teacher does (Shuell, 1986). The role of the teacher, rather than directly influencing student achievement, is to create an environment that encourages students to use effective motivational patterns that consequently enable them to learn. An important dimension of such an environment is the facilitation of active student engagement in tasks related to learning goals.

This study concerns students' motivational patterns in contrasting learning environments. A setting in which the achievement goal is acquisition of a motor skill, such as a physical education class, is well suited for the examination of active student involvement. Typically in this situation, techniques and concepts are presented in the initial phases of instruction. Then students progress to independent practice situations in which they decide whether to practice and

how much effort to expend. The public nature of practicing a motor skill facilitates the objective evaluation of active engagement, operationalized by the quantity and quality of trials that students execute. This project was designed to investigate the impact of contrasting motivational climates on students' levels of active engagement, as reflected by their willingness to practice assigned tasks.

### Goal Theory

A goal theory approach to the study of achievement motivation provides a framework from which to conceptualize environments conducive to active student engagement (Nicholls, 1984, 1989). Achievement goal theory asserts the existence of two major goal states in achievement settings. A task-involved goal perspective is defined by a self-referenced criterion for success, with an emphasis on learning a skill and improving individual performance. Other researchers have labeled analogous goal dimensions as  *mastery oriented* (Ames & Archer, 1988) and as  *learning goals* (Dweck & Leggett, 1988; Elliot & Dweck, 1988). This goal perspective is associated with adaptive motivational patterns such as exerting effort, seeking challenging tasks, persisting in the face of difficulty, and attributing success to effort. Because of the internally referenced criteria for success, a sense of achievement is always possible on the basis of improved performance or successful completion or mastery of a task. This goal dimension is associated with the view that competence or ability can be increased through effort.

An ego-involved goal perspective is delineated by the evaluation of success in comparison with the performance of others. Parallel terminologies for this dimension are  *ability goals* (Ames, 1984) and  *performance orientation* (Dweck & Leggett, 1988; Elliot & Dweck, 1988). Individuals within this goal orientation are deemed at risk to display maladaptive behaviors such as an unwillingness to exert effort when task demands are high and a tendency

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to avoid challenge. The attribution of success to ability is also associated with this perspective. Because the criterion for success depends on the performance of peers, improved skill or mastery of a task is not sufficient to produce feelings of competence. One must outperform others to evoke a sense of achievement and, consequently, may not always view success as a possibility. From this viewpoint, ability is likely to be characterized as a fixed attribute. If the individual perceives himself or herself to lack the ability to succeed (beat others), he or she finds little or no reason to exert effort.

Although different authors have used a variety of terms to distinguish the dimensions of goal perspective, the theoretical constructs are congruent regardless of the label used. When investigators have focused on goal perspective in physical activity settings, they typically have used the terminology of Nicholls (1984, 1989), with *task involved* referring to a mastery- or learning-oriented perspective and *ego involved* reflecting a performance-oriented perspective; that is the nomenclature that I use primarily in this article.

Researchers who have investigated goal theory have addressed achievement-related cognitions, affective responses, and behavior. Results from classroom-based studies (Ames & Archer, 1988; Elliot & Dweck, 1988; Nicholls, Patashnick, & Nolen, 1985), sport settings (Duda, 1989, 1992; Duda & Nicholls, 1992; Seifriz, Duda, & Chi, 1992), and physical education classes (Solmon & Boone, 1993; Walling & Duda, 1995) have been congruous with theoretical predictions, consistently supporting the notion that task goals are conducive to the development of effective motivational patterns.

Researchers generally agree that individuals vary with regard to individual dispositions for the development of task- or ego-involved goal perspectives (Duda, 1992; Dweck & Leggett, 1988; Nicholls, 1989), but it is apparent that the motivational climate in an achievement setting has the potential to enhance or constrain individual goals (Ames, 1992a, 1992b; Elliot & Dweck, 1988). Dweck and Leggett (1988) maintained that the probability of adopting a particular goal perspective in a specific setting is determined by individual-difference variables, but they assert that situational factors have the potential to alter that probability.

From this perspective, it is important to explore the relationship between motivational climate and achievement-related cognitions and behaviors. Using an instrument developed to assess students' perceptions of classroom goals, Ames and Archer (1988) investigated relationships between specific motivational processes and the salience of mastery and performance goals. They associated the perception of a task-involved climate with the use of effective learning strategies, preference for challenging tasks, positive attitudes about the class, and a belief that success is attributable to effort. When students perceived an ego-involved orientation to be salient in their classes, they tended to focus on ability rather than effort and were more likely to evaluate their ability in a negative manner. Perceptions of the motivational climate in physical activity settings have also been investigated, and the results are consistent with those re-

ported in the classroom. Perceived task-involved climates are associated with measures of intrinsic motivation and the belief that effort leads to achievement. Perceived ego-involved climates are affiliated with the attribution of success to ability and with decreases in motivation, especially when the perception of ability is low (Papaioannou, 1995; Seifriz et al., 1992). These studies indicate that the perception of a task-involved climate is associated with effective motivational patterns and that these patterns are less likely to be evident when an ego-involved climate is perceived.

Ames (1992a), using dimensions initially delineated by Epstein (1989), has outlined strategies that can be implemented in achievement settings to create a task-involved climate that fosters effective motivational patterns. Strategies are grouped into six dimensions, or structures, of the learning environment: task, authority, recognition, grouping, evaluation, and time. (The acronym TARGET is used to identify this classification of strategies.) At least three field-based studies have been conducted in physical activity settings with the strategies that Ames (1992a) outlined. Treasure (1993) manipulated the motivational climate in a physical education context and reported that students in a task-involved climate demonstrated a more adaptive pattern of achievement cognitions and affective responses than those in an ego-involved climate. After an intervention with teachers designed to increase the salience of a task-involved climate, Boone (1995) reported positive changes in students' perceptions of the motivational climate in physical education classes. Students in classes of teachers who implemented TARGET strategies also demonstrated a faster rate of skill improvement than students in control classes. In a study by Theeboom, DeKnop, and Weiss (1995), children in a task-involved climate demonstrated superior skill performance and expressed higher levels of enjoyment compared with children in a traditional sport program.

Taken together, these initial studies manipulating motivational climates in field settings support the contention that a task-involved climate facilitates effective motivational patterns. Although it is promising that individuals who say they perceive a task-involved climate indicate they are more willing to persist or exert effort in challenging situations, virtually no data exist concerning what they actually do in physical activity settings. In addition, there is little information about the impact of motivational climates on beliefs about success. This study investigated differences in students' behavior and their beliefs about the causes of success as a function of contrasting motivational climates. It is significant because it provides data concerning students' observed persistence on a task and extends the knowledge base with regard to the characteristics students perceive as salient in contrasting motivational climates.

The initial issue addressed was whether students would report differing perceptions of motivational climates structured by the researcher to be either task or ego involved. Once it was established that task- and ego-involved climates were perceived differently, two primary research questions were addressed. The first was whether the students' persistence, as reflected by the number of practice trials students attempted, would differ as a function of motivational cli-

ate. It was hypothesized that individuals in a task-involved climate would be more willing to exert effort during practice at a challenging level, as reflected by their persistence, than those in an ego-involved climate. The second question addressed whether students' attributions for success would differ on the basis of motivational climate. Theoretical predictions were that students in task-involved climates would attribute success to motivation and effort, whereas those in an ego-involved climate would be more likely to attribute success to ability. To develop a more complete understanding of the impact of contrasting motivational climates, I examined teachers' perceptions of task and ego climates.

## Method

### Participants

Participants were 109 (53 girls and 56 boys) seventh- and eighth-grade students enrolled in physical education classes. The student population of the school consisted of children from families of middle to upper income. The representation of minority students in the study was approximately 30%, which is reflective of the community. Informed parental consent was obtained for each participant.

Four graduate students (2 men and 2 women) participated as teachers in the study. All had extensive teaching experience and were familiar with the task selected for the study. They were aware of the purpose of the study as well as the hypotheses concerning the impact that task- and ego-involved climates were predicted to have on students.

### Data Collection

Students were assigned to instructional groups consisting of 6 or 8 students. Because of documented gender differences evident with respect to goal perspective (Walling & Duda, 1995) and motor skill levels (Thomas & French, 1985), instructional groups were single gender rather than coeducational. Individuals were randomly assigned to groups within the restriction of maintaining single-gender classes. Students participated in two 30-min lessons on juggling. Juggling was selected because the students were unfamiliar with the task, and it could be learned in a short period of time. A brief instructional period was deemed necessary for this study because of the potential negative effect of emphasizing social comparison in the ego-involved condition. After the second day of instruction, subjects completed two questionnaires about the juggling classes. Students who had been in the ego-involved condition were debriefed by the researcher.

According to the experimental design, teachers were instructed to create either a task- or an ego-involved climate. Lesson plans outlining sequential juggling tasks were provided, and teachers were given written and verbal instructions concerning the creation of differing motivational conditions. One week prior to the study, teachers attended a 1-hr training session in which criteria for both conditions were presented. At that time, they were given a table outlining contrasting characteristics of each climate, and each characteristic was discussed. Prior to each instructional period, criteria for the creation of the climates were reviewed.

For the task condition, instructors were directed to implement TARGET strategies (Ames, 1992a). They were to stress individual challenge, short-term goals, improvement, and self-referenced cri-

teria for success. The class environment was to focus on rewarding effort, improvement, and persistence. The instructors were to encourage students to work at their own pace, to work together, and to try to do better than on previous trials. The ego-involved condition was created through the use of a competition ladder. Performance was emphasized, and the focus of the classes was moving up the ladder and demonstrating superiority in comparison with one's classmates. The focus of the class was to win contests and be the best juggler.

All classes were videotaped for subsequent analysis. Videotapes were reviewed by the researcher to verify the authenticity of the climates.

At the conclusion of the study, the teachers were interviewed individually with the use of a structured, open-ended format. Each teacher responded to eight common questions that focused on their perceptions of the learning environments they had attempted to create. When the researcher felt that clarification was needed, these questions were followed with specific probes. Initially, teachers were asked to describe how they differentiated between the task and ego conditions. After that was established, they were questioned concerning their preferences for teaching climates, what problems they had encountered, and any differences they had noticed in the practice habits of students in the two conditions. The teachers were also questioned about their impressions of students' reactions to the contrasting conditions and about the effect of the contrasting conditions on high- and low-skilled students. The interviews averaged 30 min in length and were recorded by audiotape and later transcribed.

### Dependent Variables

*Observed motivational climate.* To verify the authenticity of the motivational climates, teachers' task- and ego-involved statements were coded from the videotapes of the classes. A sample of the tapes, representing 10% of the classes, was transcribed and carefully reviewed to develop criteria for classifying teachers' statements as either task or ego involved. Statements that reflected the use of TARGET strategies were coded as task involved. Examples of statements coded as task involved included references to individual challenge; self-referenced goals; recognition of individual progress; and encouragement of students to work in groups and help each other, to persist, and to work at their own paces at an appropriate level of difficulty. Any statement referencing success on the juggling task in relation to other members of the class was coded as an ego-involved statement. These statements included all references to moving up the juggling ladder as well as trying to be the best in the class or to outperform others. To establish reliability for this analysis, a graduate student, who was provided with the written criteria for coding statements, coded the sample transcripts. The reliability coefficient, estimated by calculating the percentage of agreement, was .92. The remaining lessons were coded directly from the videotapes by the researcher.

*Perceived motivational climate.* Students' perceptions of the task- and ego-involved conditions were assessed with a questionnaire adapted from the Perceived Motivational Climate in Sport Questionnaire (PMCSQ; Walling, Duda, & Chi, 1993). Students responded to statements beginning with the stem "In the juggling class. . ." by indicating their level of agreement with 25 statements concerning their perceptions of the motivational climate of the class on a 5-point Likert scale. Twelve statements comprised the Task-Involved subscale. Examples of these items include "trying hard was rewarded" and "students tried to improve just based on their own score." Representative items from the 13-item Ego-Involved subscale are "outperforming classmates was important"

and "only the top students got noticed." Reliability coefficients (Cronbach alphas) for the subscales were .73 for the perception of a task-involved climate and .76 for the perception of an ego-involved climate.

*Causes of success.* Students' beliefs about motivation and effort and ability as causes for success in the juggling class were assessed with a questionnaire adapted from Seifriz et al. (1992). Again, students responded on a 5-point Likert scale, indicating their level of agreement with statements. The stem for these items was "People succeed in juggling when. . ." Eight items comprised a subscale indicating attributions of success to motivation and effort. Examples of these items include "they are interested in improvement" and "they work really hard." The subscale reflecting attributions of success to ability consisted of five items, such as "they are born naturally talented" and "they are more skilled than others." Reliability coefficients were .86 for the Motivation and Effort subscale and .71 for the Ability subscale.

*Persistence.* For assessment of persistence, individual practice data for each student were collected by coding practice trials from the videotapes. Students who missed either of the instructional days were not included in the analysis of the practice data. After initial viewing of several lessons, a coding scheme was developed. Trials were classified by level of difficulty. Easy trials were those requiring tossing and catching only one or two balls. Difficult trials consisted of attempts to juggle continuously. The total number of trials or attempts at easy and difficult levels were recorded. The length of time spent in practice at easy and difficult levels was recorded so that a rate of trials per minute could be computed and compared across conditions and classes.<sup>1</sup>

Two graduate students were trained to assist in the coding of the tapes. They were presented with written criteria for coding trials and participated in three sessions to demonstrate competence and establish reliability. Reliability estimates were calculated by using the number of agreements divided by the total number of trials coded in practice segments. When the criterion of 90% agreement was met or exceeded, coding of the tapes began. The author was present and participated in all coding sessions, and periodic checks ensured that the standard of reliability was maintained.

### Design and Analysis

A nested design, in which teachers taught four independent classes under each of four conditions, was used. The four conditions included a task-involved climate for a male and female class and an ego-involved climate for a male class and a female class. The order of classes was counterbalanced. This design was used to control for teacher effect. Group differences in the perception of motivational climate (task and ego involved), attributions for success (motivation and effort as well as ability), and persistence (trials per minute at easy and difficult levels) were assessed with a 2 (motivational condition)  $\times$  2 (gender) analysis of variance (ANOVA) for each variable. The teacher was entered into the model as a blocking variable to account for variation attributable to individual teachers. The class was used as the unit of analysis. To verify the authenticity of the observed climates, the numbers of task- and ego-involved statements coded for the two motivational conditions were compared with independent *t* tests. Levene's test for equality of variances indicated that the variances were unequal, so the degrees of freedom were adjusted accordingly.

Four hierarchical multiple-regression analyses were conducted to examine the effects of the motivational condition versus the individuals' perceptions of the climate. To do this, the independent-variable motivational condition (task or ego involved) was entered into a stepwise regression model in the first block of the analysis. In the

second block, perceptions of the motivational climate, operationalized by the responses from the questionnaire (task or ego involved), were entered as independent variables into the model. This, in effect, partitioned out or controlled for the effect of the motivational condition so that the predictive value of the perceived climate could be more closely examined. The four dependent variables were trials per minute at an easy level, trials per minute at a difficult level, attributions of success to ability, and attributions of success to motivation and effort.

The interview data were analyzed inductively, with constant comparison used to derive themes relevant to teachers' perceptions of the contrasting climates and the ways they affected students (LeCompte & Priessle, 1993). I carefully reviewed the interview transcripts several times and organized commonalities among the responses into themes representative of the teachers' insights. To accomplish this, units of meaning from the teachers' responses were extracted from the transcripts, and these units were compared and contrasted within the preliminary categories until the definitions of the categories were clarified. I then conducted a frequency count of the statements supporting each theme or category. To establish reliability for this analysis, a graduate student with extensive experience in qualitative analysis read the descriptions of the categories and coded the interview segments. The reliability coefficient, estimated by calculating the percentage of agreement, was .87. After the coding process had been completed, the complete transcripts were reviewed again to search for negative cases, that is, statements that were in conflict with the identified themes.

## Results

Means and standard deviations for all variables are reported in Table 1. To facilitate comparison between subscales, I divided the total scores for each subscale by the number of items to generate a mean based on the five-point response scale.

### Observed Motivational Climate

The analysis of the task- and ego-involved statements indicates that teachers effectively created the intended motivational climate. Significantly more task statements were coded for the task-involved condition,  $t(9) = 7.14, p < .001$ , and more ego statements were coded for the ego-involved condition,  $t(7) = 9.14, p < .001$ .

### Perceptions of the Motivational Climate

Students in the task-involved condition perceived a higher level of task involvement than did those in the ego-involved condition,  $F(1, 9) = 74.56, p < .01, \eta^2 = .89$ . Perception of a task-involved climate did not differ as a function of gender or teacher, and the Gender  $\times$  Condition interaction was not significant. Conversely, students in the ego-involved condition perceived a higher level of ego orientation than did those in the task-involved condition,  $F(1, 9) = 19.41, p < .01, \eta^2 = .68$ . The gender effect for the perception of ego orientation was also significant, with boys tending to per-

<sup>1</sup> Differences in success on the juggling task were not predicted, nor were they found, after the limited practice periods used in the study.

Table 1  
Means and Standard Deviations for Teachers' Statements and Students' Perceptions, Practices, and Beliefs About Success

Variable	Task condition			Ego condition			Overall condition		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Teachers' task statements per class									
<i>M</i>	48.68	39.94	44.31	16.56	14.25	15.75	27.09	32.63	29.86
<i>SD</i>	12.18	10.79	10.85	2.63	4.52	4.06	15.15	19.01	16.85
Teachers' ego statements per class									
<i>M</i>	3.94	3.00	3.47	63.13	68.13	65.63	35.56	33.14	34.54
<i>SD</i>	2.01	1.81	1.84	23.86	16.40	19.14	37.44	35.31	34.68
Perception of a task climate									
<i>M</i>	3.89	3.78	3.83	3.40	3.44	3.42	3.63	3.61	3.62
<i>SD</i>	0.29	0.39	0.34	0.51	0.53	0.52	0.49	0.49	0.49
Perception of an ego climate									
<i>M</i>	2.35	2.66	2.52	2.90	3.13	3.01	2.64	2.89	2.77
<i>SD</i>	0.42	0.58	0.52	0.58	0.52	0.56	0.57	0.60	0.60
Easy trials per minute									
<i>M</i>	17.13	17.24	17.19	17.22	20.32	18.68	17.18	18.78	17.90
<i>SD</i>	4.36	8.88	6.97	7.41	8.10	7.82	6.14	8.55	7.40
Hard trials per minute									
<i>M</i>	5.29	5.82	5.55	4.57	4.76	4.66	4.90	5.26	5.08
<i>SD</i>	1.75	1.99	1.87	1.72	1.81	1.75	1.75	1.95	1.85
Success to effort									
<i>M</i>	3.88	3.84	3.86	4.10	3.76	3.93	3.99	3.80	3.89
<i>SD</i>	0.79	0.80	0.78	0.54	0.82	0.71	0.67	0.80	0.75
Success to ability									
<i>M</i>	2.45	2.66	2.56	2.71	2.86	2.79	2.59	2.76	2.68
<i>SD</i>	0.75	0.78	0.77	0.95	0.79	0.87	0.87	0.79	0.82

ceive a higher level of ego orientation than girls,  $F(1, 9) = 5.44, p < .04, \eta^2 = .38$ . As was the case for task orientation, there was no teacher effect for perception of ego orientation and no Gender  $\times$  Condition interaction.

### Persistence

Analysis of the practice data revealed differences in student behavior as a function of the experimental condition. Because of the variability between classes in the amount of time spent at easy and difficult levels, comparison of numbers of trials within difficulty levels was conducted by dividing the number of trials by the amount of time spent in practice at that level. The two groups did not differ on the average number of trials per minute during practice on easy tasks. However, students in the task-involved condition completed a significantly higher number of difficult trials per minute than those in the ego-involved condition,  $F(1, 9) = 9.03, p < .01, \eta^2 = .50$ . No gender or teacher differences were evident, and there was no Gender  $\times$  Condition interaction.

### Causes of Success

The analysis for group differences on attributions for success revealed no significant effects with regard to motivation and effort. Students in the ego-involved condition were more likely to attribute success to ability than were those in the task-involved condition,  $F(1, 9) = 8.93, p < .02, \eta^2 = .50$ . The gender effect for attributing success to

ability was also significant,  $F(1, 9) = 5.86, p < .04, \eta^2 = .29$ , with boys rating ability higher than girls rated it as a cause of success. Teacher effect and the Condition  $\times$  Gender interaction were not significant.

### Hierarchical Multiple Regression

The motivational condition was not a significant predictor of the rate of practice at an easy level. Neither the perception of a task-involved climate nor that of an ego-involved climate accounted for a significant portion of the remaining variance in the second block of the model. The motivational condition was, however, a significant predictor of the number of trials attempted per minute at a difficult level,  $F(1, 93) = 5.36, p < .02, R^2 = .054$ . Again, neither task- nor ego-involved perceptions of the climate entered in the second block of the model, indicating that when the variance accounted for by the motivational condition was controlled for in the model, perceptions of the climate failed to predict effort or persistence.

With regard to beliefs about causes of success, motivational condition was not a significant predictor for either motivation and effort or ability in the first block of the models. In the second block, perceptions of the climate failed to account for a significant portion of the variance in the prediction of attributing success to motivation and effort. Perception of a task-involved climate failed to predict the attribution of success to ability, but the perception of an ego-involved climate entered into the second block of this model,  $F(1, 107) = 14.37, p < .01, R^2 = .118$ . This

indicates that after motivational condition was controlled for in the model, the perception of an ego-involved climate accounted for a significant portion of the variability associated with attributing success to ability.

### *Teacher Perceptions*

When interviewed, all teachers indicated a preference for teaching in the task-involved condition. Inductive analysis revealed three common elements or themes among their responses that explain their preference.

*Ego climates can cause problems.* Each teacher recounted incidents from the ego-involved condition, indicating that this setting was problematic for many students. Any reference to a problem or difficulty evident in the ego condition was coded in this category, and for each teacher, the highest number of coded units of meaning were associated with this theme. Instances of arguments and cheating in the ego-involved climate were related by the teachers. During the coding of the videotapes, the inclination of some students to pad their scores was evident. The following incident, recounted by a teacher in response to the question about his preference for teaching climates, is representative of these experiences:

I preferred teaching in the task condition, because in the ego condition only the top students got any reinforcement. The worst was with my girls' class in the ego condition. One of the girls who was unsuccessful wanted to be at the top of the ladder, so she lied about the number of tosses she had done. Other girls in the class started watching and counting her tosses, and when they knew she could not do as many as she had said she could, they started calling each other names, and the girl was almost in tears. I had to take her aside and try and calm her down. It was a bad experience.

The four teachers also experienced management difficulties in the ego-involved condition, especially with students who were unsuccessful. All teachers made reference to problems they had with students who would not continue to work on assigned activities in the ego condition. When asked about what problems he had encountered, one teacher commented, "In the ego condition, if I did not monitor them specifically, they would not practice at all, but did other things instead."

*The skilled always improve, but the others...* When teachers referred to a disparity between low- and high-skilled students with regard to the motivational condition, statements were coded in this category. All four teachers believed that highly skilled students, or those at the top of the ladder, thrived in both the task- and ego-involved climates. They agreed that the ego-involved climate was problematic for students who experienced difficulty with the juggling task. As one teacher commented, "When there was no chance they were going to be as good as the other guy, they gave up."

The teachers felt that students of lower skill levels fared better in the task-involved climate, in which the focus was on individual improvement and efforts to do better on the next try. They believed that all students worked harder in the task-involved climate. When asked about differences in

practice habits, teachers responded in a manner typical to the following reply from one teacher: "I think the practice habits were better in the task condition, it was easier to keep low-skilled students practicing."

*Boys can take it better.* Another theme evident in the interviews was a perception of gender differences. Any reference to boys and girls reacting to the motivational conditions in distinct ways was coded in this category. Although none of the interview questions addressed gender, three of the teachers referred to this theme many times in their responses. They indicated that the girls experienced more difficulty in learning to juggle than the boys, and, as a result, the teachers had to progress more slowly in their classes. Of perhaps more consequence, though, was the teachers' perception that the girls reacted more negatively to the ego condition than did the boys:

The boys accepted the ego condition more easily. They were more interested in the competition, and the low-skilled ones, even though they did not work hard, seemed to be able to cope better, maybe by acting like they weren't trying. The disparity in the ego condition for the girls seemed to create a stressful atmosphere of comparison. It seemed like the girls at the top of the ladder did not really want to compete, and the ones at the bottom of the ladder were more frustrated than the boys at the bottom.

The final teacher interviewed did not mention gender in his responses to the questions in the structured format. Because the other teachers had all expressed similar views about gender, I asked this teacher about his perceptions in this regard, and he indicated that the girls were not as interested in competing as the boys and did not fare very well in that environment. When asked about gender specifically, the fourth teacher made statements coded in this category that were consistent with the other teachers, and he referred to gender in his closing remarks about the experience.

After the interview segments had been coded, the complete transcripts were reviewed again to detect negative cases. The review of the data revealed no inconsistencies between the teachers' responses and the identified themes.

### Discussion

The results of this study are important for several reasons. The initial research question addressed whether students' perceptions of the motivational climate would differ as a function of the task- or ego-involved condition that teachers tried to create. Observation of the classes, reflected by the coding of task- and ego-involved statements, provided evidence of the authenticity of the motivational climates established by the teachers in the study. Students' perceptions accurately reflected the intended motivational condition, further verifying that the motivational conditions were, in fact, different. This suggests that when teachers make an effort to create either a task- or an ego-involved climate, they can implement strategies to produce differential climates, and students perceive the salience of those environments.

Once the differential climates had been established, the

search questions focused on differences in levels of persistence and beliefs about the causes of success. Results from the video coding of student practice behaviors indicated that students in the task-involved condition were more persistent during practice at a difficult level than were those in the ego-involved condition. The hierarchical linear regression analysis supports the notion that the motivational condition, rather than variation in individual perceptions of the climate, was responsible for the difference in levels of persistence. This finding extends research by providing information with regard to what students actually do in achievement settings, rather than what they say they do, and is consistent with results from studies based on self-report instruments (Ames & Archer, 1988; Solmon & Boone, 1993). Findings are congruent with theoretical predictions that individuals in an environment consistent with a task-involved goal perspective exert effort on challenging tasks. Conversely, students in an ego-involved setting were unlikely to persist in practice at a difficult level. This finding suggests that situational influences can be powerful factors in achievement settings. Efforts on the part of teachers to create an environment that emphasizes a task-involved climate appear likely to facilitate adaptive practice patterns for all students.

These data also suggest that, in an activity setting, students may use effort reduction, reflected by the lower number of trials at a difficult level, as a strategy to avoid embarrassment and maintain perceptions of competence in an ego-involved condition. When Jagacinski and Nicholls (1990) addressed this issue using hypothetical scenarios, they found that college students rejected the possibility of using effort reduction for themselves, although they indicated that they thought others might use it to protect perceived ability. Jagacinski and Nicholls suggested that individuals might use this strategy in actuality but be unaware of it. The results from this study, including the quantitative data and the teachers' perceptions, support that supposition. The teachers reported that students in the ego-involved condition gave up when they were unsuccessful, whereas individuals in the task-involved classes continued to try; the coding of practice trials is consistent with this observation.

As with previous findings (Duda & Nicholls, 1992; Walling & Duda, 1995), this study also supports the concept that an ego-involved climate fosters the belief that success is attributable to ability. The belief that ability is a major cause of success, associated with the ego-involved climate, can be problematic for students. If success is defined by comparison with others, and if ability is viewed as a stable characteristic, there is no logical reason to persist in the face of difficulty if students believe that they lack the ability to outperform their peers. The results of the hierarchical linear regression indicate that an individual's perception of an ego-involved climate was a significant predictor after the variance attributable to the motivational condition was accounted for, and that perception of an ego-involved climate was a better predictor than was the motivational condition. This finding suggests that beliefs about causes of success are more closely related to individual variation in perceptions than to a climate created by a teacher. To determine

whether beliefs about success are tied more closely to dispositions than to situations, researchers need to study both the variables in the same investigation.

The results with regard to gender differences suggest that boys are more likely to perceive the ego-involved characteristics as salient than are girls, and this is consistent with previous findings that boys are higher in ego-involvement than girls (Walling & Duda, 1995). The teachers' perceptions concerning the boys' ability to cope with the ego condition more effectively than the girls complement the results from the questionnaires. Similar findings have been reported in math classes (Peterson & Fennema, 1985), in which engagement in competitive activities was negatively related to low-level math achievement for girls, but this relationship for boys was positive. In physical education classes, boys have tended to rate the provision of opportunities to compete as a more important purpose than girls have rated such opportunities (Walling & Duda, 1995). Gender differences in interaction patterns within the context of learning fundamental motor skills have been evident even with preschool children (Garcia, 1994). Girls interacted in a cooperative, caring manner, whereas boys were characterized as competitive. The results of this study support the notion that boys tend to react differently than girls in ego-involved environments.

In this study, the tendency for boys to be more likely than girls to attribute success to ability is not consistent with the finding of Walling and Duda (1995) that the gender effect was not significant. According to a review by Biddle (1993), few gender differences with regard to attributions for success in sport have been found, although this is not consistent with research in other contexts. Biddle suggested that gender differences in causal attributions found in other contexts may be closely related to expectations for success and that these expectations may not differ across gender in athletic settings. One explanation for the finding in this study is a difference in the success experienced. In the male classes, one or two students in each class learned to juggle quickly, whereas others struggled and experienced little success. In the female classes, almost everyone struggled to learn the task. It is plausible that the girls were less likely to attribute success to ability, because they all appeared to have to work hard to succeed.

The evidence from this investigation demonstrates the applicability of a goal-perspective approach in studying ways to optimize learning environments. It provides data indicating that students' overt behaviors in classes are affected by the goal perspective of the motivational climate. The results of this study are promising in that they suggest the importance of providing a learning environment in which task-involved characteristics are salient; this type of learning environment has the potential to positively affect students' motivational patterns in achievement settings. With conscious effort, teachers can implement strategies to create task-involved climates that produce a learning environment that is equitable for all students. The fact that this can be accomplished in a physical activity setting, in which competitive factors are inherently associated with motor

skills and practice is by nature open to public view, is especially encouraging.

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