The Role of Perceived Competence in the Motivation of Physical Activity[1]

By: Layon Williams and Diane L. Gill

Williams, L. & Gill, D.L. (1995). The role of perceived competence in the motivation of physical activity. Journal of Sport and Exercise Psychology , 17, 363-378.

Abstract:

Understanding the role of perceived competence in the motivation of sport and physical activity is an importan1 endeavor. This study attempted to examine the role of perceived competence by (a) investigating its relationship with goal orientations as hypothesized by Nicholls's theory of achievement motivation, and (b) testing a proposed model linking goal orientations and motivated behavior. Students (N = 174) completed questionnaires assessing goal orientations, perceived competence, intrinsic interest, and effort. Regression analyses revealed that task orientation was a good predictor of effort; however, the interaction of ego orientation and perceived competence failed to adequately predict effort. Path analysis results revealed that task goal orientation, but not ego orientation, directly influenced perceived competence, intrinsic interest, and effort. In addition, intrinsic interest played a mediating role between perceived competence and effort and between task goal orientation and effort.

Key words: goal orientation, intrinsic interest, motivated behavior

Article:

Why do some children continue to work and try hard to achieve in certain activities while others give up or stop trying? Questions such as this one are central to understanding motivation and to working with children in physical activity settings. A plethora of research on motivation exists in both educational and sport science journals. Contemporary achievement motivation theorists (Ames, 1992; Dweck, 1986; Nicholls, 1989) take a social cognitive approach to the study of motivational and behavioral patterns, and suggest that the primary focus of individuals in achievement settings is the demonstration of competence. When individuals believe they have demonstrated competence, they perceive themselves as successful, whereas feelings of failure are experienced when they have not shown themselves to be competent. The demonstration of competence, however, can have various meanings. According to Nicholls (1984, 1989), individuals can demonstrate competence via two goal orientations. Under a task goal orientation, ability is conceived in terms of learning, improvement, and effort, and these qualities lead to greater mastery and achievement. Thus, ability and success are self-referenced. In contrast, an ego goal orientation denotes a conception that the demonstration of competence is dependent upon performing favorably in comparison to others. In this case, subjective success and competence are norm referenced.

Although theorists differ on terminology, they all (a) agree that goals influence individuals' responses to achievement events and (b) suggest that individuals' goal orientations influence motivated behavior. Nicholls has hypothesized that, regardless of the level of perceived competence, task goal orientation is positively associated with effort (Duda, 1992; Nicholls, 1989; Nicholls & Miller, 1984). Similarly, a positive association is predicted between ego orientation and effort when perceived competence is high. Unfortunately, more maladaptive behaviors are predicted under conditions of ego involvement and low perceived competence. Specifically, Nicholls predicts that ego goal orientation in combination with low perceived competence is negatively associated with persistence and behavioral intensity (Nicholls & Miller, 1984).

[1] *Acknowledgments:* Appreciation is extended to the teachers and students involved in this study and to Drs. J.B. Griffith III, Thomas J. Martinek, and Kara Brown for their assistance in contacting schools and organizing data collection. This study was funded by the Susan Stout Graduate Fellowship Award from the Department of Exercise and Sport Science, University of North Carolina at Greensboro.

Research has demonstrated relationships among goal orientations, persistence, behavioral intensity, and self-perceptions in recreational and competitive sport participants. Specifically, high task goal orientation has been found to be positively related to persistence and effort (Duda, 1988, 1989a; Duda, Smart, & Tappe, 1989). Sport participants high in both ego and task goal orientation exhibit adaptive motivated behavior in the form of effort (Duda, 1988). Additionally, positive self-perceptions such as physical self-esteem and perceived competence are associated with task orientation, whereas more negative associations have been found with ego goal orientation (Duda, 1988, 1989a, 1989b; Duda, Fox, Biddle, & Armstrong, 1993; Duda & Hom, 1993; Duda, Olson, & Templin, 1991; Marsh, 1994). For example, Burton (1989) found that swimmers trained in a goal-setting program that emphasized success relative to personal performance standards rather than performance outcome were higher in perceived competence than swimmers who were not involved in the training program. Although this research is based upon the assumption that an emphasis on mastery, learning, and improving will foster feelings of competence and result in increased effort, whereas ego orientation (with an emphasis on performing as well as others) cultivates feelings of low perceived competence and effort, perceived competence was not measured.

Recently, researchers examined the relationship between goal orientations and perceived competence (Duda & Nicholls, 1992; Duda, Chi, Newton, Walling, & Catley, 1995; Seifriz, Duda, & Chi, 1992). Specifically, Duda et al. (1995) hypothesized no appreciable association between goal orientations and perceived competence, but analyses revealed a moderate and positive relationship between task orientation and perceived competence in one of two samples. The association between goal orientation and perceived competence was also supported by Duda and Nicholls (1992) and Seifriz et al. (1992), who reported that task orientation predicted perceived competence and effort. Specifically, high school athletes who scored higher on task goal orientation also reported themselves as higher in ability and exerting greater effort than those scoring lower in task goal orientation.

Contemporary achievement motivation theorists and researchers argue that an emphasis on task mastery (task orientation) fosters feelings of competence and greater effort, whereas the goal of outperforming others (ego orientation) is likely to lead to feelings of incompetence, less persistence, and behavioral intensity (Ames, 1984; Duda, 1992; Dweck, 1986; Nicholls, 1989; Roberts, 1992). Researchers have provided valuable information supporting these relationships, but have neglected to examine the mediating role of perceived competence as hypothesized by Nicholls (1989; Nicholls & Miller, 1984). Although a positive relationship between effort and task goal orientation is predicted, predictions concerning ego goal orientation depend upon the individual's level of perceived competence. Specifically, individuals who believe ability means outperforming others (ego oriented) and who believe they can perform as well as or better than others should demonstrate adaptive motivated behavior by trying hard and persisting. Conversely, ego-oriented individuals who do not believe they can outperform others will exhibit more maladaptive behaviors in order to mask their low ability. Thus, when examining the relationship between ego orientation and effort, in the form of hard work and persistence, the role of perceived competence must be considered.

Nicholls suggests a link between goal orientations and intrinsic interest (Nicholls, 1989). Specifically, task orientation should foster feelings of intrinsic interest, whereas ego orientation is predicted to have a negative effect on one's level of interest. This view is consistent with the theory and research on intrinsic motivation. Within the cognitive evaluation theory (CET), Deci and Ryan (1985) suggest that the relationship between perceived competence and effort is mediated by intrinsic motivation or by one's propensity to engage in challenging tasks. Specifically, they suggest that mastery leads to greater perceived competence, which then enhances one's desire to seek out additional challenges (intrinsic motivation). This sentiment is echoed by Butler (1987), who contends that "greater effort is expected to yield greater competence" (p. 269). Although the cyclical nature of this relationship is recognized particularly when individuals are attempting to establish their perception of competence, this study focuses on the influence of one's perceived competence on his or her willingness to try hard and persist.

In essence, task orientation leads to feelings of competence and intrinsic motivation. Conversely, an emphasis on one's performance relative to others (ego orientation) functions as an external control that may lead to feelings of incompetence and a lack of intrinsic motivation. Deci and Ryan's (1985) theory has been partially supported in the physical domain. Specifically, appropriate, contingent rewards and feedback that reflect favorably on one's competence leads to greater intrinsic motivation (Ryan, 1977, 1980; Thomas & Tennant, 1978; Vallerand & Reid, 1984).

Correlational support for the relationships among goal orientations, intrinsic motivation, and effort has been demonstrated in the physical domain (Duda, Chi, & Newton, 1990; Duda et al., 1995; Duda et al., 1993). With undergraduate tennis classes, simple correlations revealed that task orientation was positively related to intrinsic motivation and effort, and ego goal orientation was negatively related to intrinsic motivation and effort (Duda et al., 1990). Sampling from the British population, Duda et al. (1993) found that task orientation was positively correlated with enjoyment, whereas ego goal orientation was associated with work avoidance. Recently, Duda et al. (1995) concluded that, despite some conflicting results, task goal orientation corresponded to greater intrinsic motivation, whereas there was a trend for ego orientation to relate more negatively to intrinsic motivation.

Although a number of studies demonstrate a positive relationship between goal orientations and effort, goal orientations and perceived competence, and goal orientations and intrinsic motivation, how these constructs interrelate is still in question. Theory and research suggest that task and ego goal orientations are linked to perceptions of competence, intrinsic motivation, and effort and that perceptions of competence and intrinsic motivation may mediate the relationship between goal orientations and effort. Although it is logical to suggest that feelings of competence would lead to greater intrinsic motivation that in turn leads to greater effort, this has not been examined explicitly. One reason for the lack of research may lie in the measurement of intrinsic motivation.

The intrinsic motivation inventory (IMI, Ryan, 1982), a popular measure of intrinsic motivation in the physical domain (Duda et al., 1990; Duda et al., 1995; Duda et al., 1993; McAuley & Tammen, 1989; McAuley, Wraith, & Duncan, 1991), assesses four underlying dimensions of intrinsic motivation: interest/enjoyment, perceived competence, effort/importance, and pressure/tension. Because perceived competence and effort are embedded in the measure of intrinsic motivation examining the role of perceived competence and effort, using the IMI as a measure of overall intrinsic motivation is not feasible. Rather, in this case the intrinsic interest and enjoyment dimension is a more appropriate measure.

In this study, we propose to examine the interrelationships among goal orientations, perceived competence, intrinsic interest, and effort. We predict that perceived competence is directly linked to effort and that it fosters feelings of interest that in turn lead to greater effort. Figure 1 illustrates the proposed relationships among these constructs. Although not discussed explicitly, previous research indicates that males tend to score higher on perceived competence than females (Brustad, 1993; Duda et al., 1995; Eccles & Harrold, 1991), thus a direct line from gender to perceived competence is included.

In sum, the purpose of this study is twofold. The first purpose is to examine the basic tenets of Nicholls's (1989) goal perspective theory of achievement motivation by investigating the relationships among goal orientations, perceived competence, and effort. Specifically, two hypotheses are forwarded: (a) Task goal orientation is positively related to effort, and (b) ego goal orientation with high perceptions of competence is positively associated with effort, whereas ego goal orientation accompanied by low perceptions of competence is negatively related to effort. The second purpose of this study is to test a conceptual model that links goal orientations, perceptions of competence, interest, and effort (see Figure l). We predict that students' grade levels will be positively related to ego goal orientation (Chaumeton & Duda, 1988; Nicholls, 1989). Task goal orientation directly fosters feelings of perceived competence, interest, and effort, whereas ego goal orientation leads to perceived incompetence, a lack of interest, and less effort. Perceptions of competence and interest also function as positive mediators

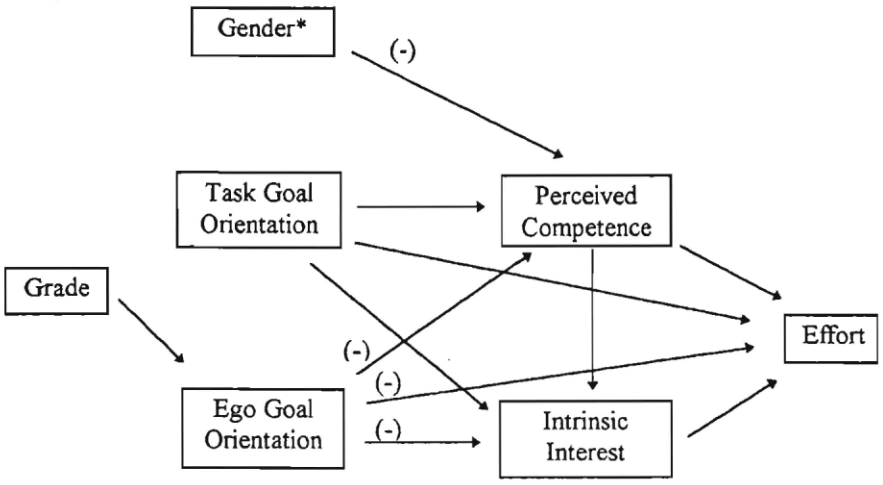

Figure 1 — Proposed model of the relationships among goal orientations, perceived competence, intrinsic interest, and effort. Negative causal pathways are indicated by a negative sign (–), and positive causal paths are devoid of notation. *The negative sign indicates that the association between gender and perceived competence is expected to reflect that males are typically higher in perceived competence than females.

of effort. That is, goal orientations directly affect perceived competence and interest, which in turn directly influences effort. In addition, it is anticipated that perceptions of competence lead to greater interest.

Method

Participants

Participants consisted of 103 female and 71 male physical education students ranging in age from 11 to 15 (M = 12.7, SD = 1.07) from two middle schools in two school districts in the Southeast. Students were in Grades 6 (n = 54), 7 (n = 58), and 8 (n = 62). They also represented some diversity in regard to race: White (n = 97), Black (n = 51), Hispanic (n = 1), Native American (n = 2), Asian (n = 6).

Measures

Three self-report questionnaires assessed (a) background information, (b) perceptions of physical competence, (c) goal orientations, and (d) perceived effort. The background questionnaire asked athletes to respond to items such as gender, age, grade, whether they compete on an organized sport team, and years of experience.

Perceptions of Physical Competence. The physical subscale of the Perceived Competence Scale for Children (Harter, 1982) assesses children's levels of perceived competence in the physical setting. This subscale consists of six questions presented in a structured alternative format. Children respond to bipolar statements (e.g., *really true for me* or *sort of true for me)* scored on a 4-point scale. A score of 4 represents a higher degree of perceived competence, and the overall scores can range from 6 to 24 points. This subscale has demonstrated validity and reliability in the sport setting (Weiss, 1987).

Perceived Effort. A self-report questionnaire designed by the investigators was used to assess children's perceptions of their effort when engaged in physical activity. The scale measures two components of effort: how hard children try (behavioral intensity) and how long they persist in physical activity (persistence). The Behavioral Intensity and Persistence subscales each consisted of three items presented in a structured alternative format. Children respond to bipolar statements (e.g., *really true for me* or *sort of true for me)* scored on a 4-point scale. Items on the Behavioral Intensity subscale included the following:

- Some kids don't try hard in sport and games when they aren't playing well, but other kids try hard in sports and games even when they aren't playing well.

- Some kids like to practice and work hard at sport and games, but others do not like to practice a lot or work hard at sport and games.
- Some kids like to wait until the coach or teacher tells them to practice, but others will practice to improve their skills in games and sport even when nobody tells them to practice.

Items on the Persistence subscale consisted of the following:

- When a game or sport is hard, some kids will continue to play that game or sport, but others try something else (e.g., music, art, a different sport or game) when the game or sport is hard.
- Some kids stop playing a sport or game when they find that they aren't so good at it, but others will continue to play that sport or game even when they aren't very good.
- Some kids will practice skills and sports for a short time and then move on to different skills or sports, but other kids keep practicing one skill or sport for a long time.

Pilot testing revealed marginal internal consistencies with alpha coefficients of .70 and .64 for Behavioral Intensity and Persistence, respectively. However, Cronbach's (1951) alpha coefficient of the 6 items together for overall effort revealed adequate internal consistency (alpha = .82). All items correlated with and contributed to the overall alpha coefficient. Thus, in this research project the construct of perceived effort was assessed and defined as individuals' continued participation in sport or physical activity, and their propensity to work hard and to spend time practicing, particularly in the face of obstacles.

Goal Orientations. The Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda, 1992) assesses individuals' goal orientations. The TEOSQ is a 13-item scale that measures the degree to which individuals identify with ego and task goal orientations in the sport setting. Seven items reflect task goal orientation (e.g., I feel most successful in physical games and sport when I work really hard), and six items reflect ego goal orientation (e.g., I feel most successful in physical games and sport when I am the only one who can do the play or skill). Individuals indicate the degree to which they agree with each situation on a 5-point Likert-type scale ranging from *strongly disagree* to *strongly agree.* Mean scores on the Task and Ego subscales range from 1 to 5. In the physical domain, the TEOSQ has been found to be reliable and valid (Duda, 1992; Duda et al., 1991).

Intrinsic Interest. The Enjoyment/Interest subscale of the IMI (Ryan, 1982) was used to assess interest. Participants indicated the degree to which they agree with each of the five statements on a 7-point Likert-type scale ranging from *strongly disagree* to *strongly agree.* Scores range from 5 to 35. The validity and reliability of the IMI and the Enjoyment/Interest subscale have been demonstrated in the physical domain (McAuley et al., 1991).

Procedures

Access to the schools and to the students was granted by educational authorities from the two school districts. Six health teachers from two schools were contacted, and they agreed to participate in this study. The teachers were given written information concerning the nature and purpose of the study. During a class session, a brief explanation of the study was presented to the students, and all were invited to participate. The students were informed that (a) participation in the study was strictly voluntary, (b) the information they would give would be confidential, and (c) they could withdraw from the study at any time. Teachers distributed informed consent forms and collected them upon completion.

Data were collected during a class session. At one school (School A) students who had returned the consent forms were taken to an empty classroom and given the questionnaires. An exception to this procedure was a sixth-grade class in which study participants were separated from nonparticipating students, but remained in the same room with the classroom teacher monitoring the nonparticipants. At the second school (School B), participants and nonparticipants remained in the same classroom. While participating students filled out their survey, nonparticipants worked on another task.

The importance of answering each question honestly was stressed, and students were reminded that their responses would remain anonymous and confidential. The investigator explained the format of each questionnaire. Each item was read aloud by the investigator, and students were encouraged to answer each question as it was read. Students took 20 to 30 minutes to complete the questionnaires.

Results

Preliminary analyses were conducted to (a) ascertain descriptive statistics and calculate internal consistency estimates for the perceptions of physical competence, perceived effort, goal orientations, and intrinsic interest variables and (b) assess possible gender, grade, and class differences using multivariate analysis of variance techniques for goal orientation, perceived competence, intrinsic interest, and effort. Primary analyses were conducted to (a) examine the relationships among goal orientations, perceived competence, and effort and (b) test a conceptual model that links goal orientations, perceptions of competence, intrinsic interest, and effort. Specifically, regression analyses were utilized to examine the relationships among goal orientation, perceived competence, and effort; causal path modeling was employed to test the conceptual model linking goal orientations, perceptions of competence, intrinsic interest, and effort.

Internal Consistencies and Descriptive Statistics

Perceptions of Physical Competence. The Physical subscale of the Perceived Competence Scale for Children (Harter, 1982) had a Cronbach's (1951) alpha coefficient of .76. Scores for perceived physical competence were slightly skewed to the left, revealing that overall students scored high on their perceived physical competence. The observed scores ranged from 1 to 6 *(M* = 2.72, *SD* = .64).

Perceived Effort. Initial pilot testing on the Perceived Effort scale used in this study revealed adequate internal consistency (alpha = .75) when combining the three items representing behavioral intensity and the three representing persistence as opposed to examining these constructs separately. Factor analytic procedures were used to confirm the integrity of the structure underlying the scale. A principal component factor analysis with varimax rotation was conducted using the six behavioral intensity and persistence items. Using eigenvalues greater than one and examination of the scree plot as criteria, one factor emerged. With an eigenvalue of 2.72 (percentage of variance = 45.5), all items loaded with a .35 or higher. The factor, representing both behavioral intensity and persistence, was labeled Perceived Effort, and a total score was created by summing the item scores. Perceived Effort demonstrated adequate internal consistency with an alpha coefficient of .75 and all items correlated with and contributed to the overall alpha coefficient. Observed scores ranged from 1 to 6 *(M* = 3.30; *SD* = .58). The distribution was negatively skewed, indicating that on average students scored high on perceived effort regarding physical activity.

Goal Orientations. The TEOSQ's task and ego orientation measures had Cronbach's (1951) alpha coefficients of .84 and .86, respectively. A correlation of *r* = —.11 between task and ego indicated that the two orientations are independent constructs. Task orientation scores were skewed toward the high end of the scale, revealing that the students had high task goal orientation scores. Scores ranged from 2 to 5 *(M* = 4.29, *SD* = .54). Scores for ego orientation were normally distributed and ranged from 1 to 4.67 *(M* = 2.74, *SD* = .92).

Intrinsic Interest. The Interest/Enjoyment subscale of the IMI revealed adequate reliability with an alpha coefficient of .73. Interest scores were slightly skewed to the left, indicating that the students scored moderately high on this scale. Scores ranged from 1 to 7 *(M* = 5.97; *SD* = .93).

Gender, Grade, and Class Differences

Previous research has demonstrated gender and possible age (as hypothesized by Nicholls, 1989) differences in goal orientations (Duda, 1988, 1989a,

Table 1 Means and Standard Deviations

	Gender				Grades					
	Males		Females		6		7		8	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Ego	2.72	0.99	2.74	0.88	2.59	0.93	2.90	0.94	2.72	0.90
Task	4.33	0.57	4.28	0.54	4.26	0.60	4.33	0.56	4.28	0.47
Perceived competence	3.11	0.62	2.72	0.61	2.98	0.62	3.01	0.51	2.66	0.71
Intrinsic interest	6.17	0.86	5.83	0.90	6.08	0.97	6.07	0.77	5.77	1.00
Effort	3.44	0.50	3.22	0.62	3.29	0.59	3.43	0.60	3.20	0.54

1989b; Duda et al., 1994; Treasure & Roberts, 1994) and intrinsic motivation/ interest (Duda et al., 1992; Duda et al., 1994; Thomas & Tennant, 1978). Thus, a two-way Gender x Grade (2 x 3) multivariate analysis of variance conducted with ego orientation, task orientation, perceived competence, interest, and effort as dependent variables revealed significant gender differences, Wilks's lambda = .91, $F(5, 159) = 3.20$, $p < .01$. Univariate follow-up procedures revealed that males scored higher on perceptions of competence, $F(1, 163) = 15.15$, $p < .01$; interest, $F(1, 163) = 4.76$, $p < .05$; and perceived effort, $F(l, 163) = 5.46$, $p < .05$. No gender differences were found for either task or ego goal orientation. The main effect for grade and the gender by grade interaction were nonsignificant. Means and standard deviations can be found in Table l.

In this study, intact classes were used for data collection. In such cases, students' responses may be influenced by their classroom environments (Horn, 1984). To test for possible class difference a one-way class (9) MANOVA was employed with ego orientation, task orientation, perceived competence, intrinsic interest, and effort as dependent variables. Results revealed a statistically significant class effect, Wilks's lambda = .70, $F(40, 682.78) = 1.67$, $p < .05$. Univariate follow-up analyses indicated that these differences were associated with ego goal orientation. A post hoc Scheffé follow-up analysis revealed that the mean for ego orientation differed significantly between two sixth-grade classes, one each from School A and B. Given this difference, the classes investigated in this study were deemed to be more similar than different on task and ego goal orientation, perceived competence, intrinsic interest, and effort. Thus, scores were collapsed over classes.

Goal Orientations, Perceived Competence, and Effort

Simple correlational analyses revealed statistically significant positive correlations among task goal orientation, perceived competence, intrinsic interest, and effort (see Table 2). Although statistically significant, the negative relationship between ego goal orientation and perceptions of competence is minimal. Correlations among perceived competence, intrinsic interest, and effort were moderate to high suggesting that these constructs are similar.

Table 2 Simple Correlations

	Ego	Task	Perceived competence	Intrinsic interest
Task	−.11	1.0		
Perceived competence	.06	.20**	1.0	
Intrinsic interest	−.13	.52**	.63**	1.0
Perceived effort	−.01*	.43**	.50**	.68**

*$p < .05$. **$p < .01$.

Task Goal Orientation and Effort. A simple regression analysis was used to examine the relationship between task goal orientation and effort, and more specifically to investigate how gender impacts this relationship as males and females were found to differ in perception of effort, but not their goal orientations. Results indicated that approximately 19% of the variance in effort, $R = .43$, F(l, 172) = 39.82, $p < .01$, was accounted for by task goal orientation. Exploratory analyses conducted to examine the relationship separately for males and females revealed that for males approximately 7% of the variance in effort, $R = .27$, $F(I, 69) = 5.45$, $p < .05$, was associated with task orientation, whereas approximately 28% of the variance, $R = .53$, F(1, 101) = 39.62, $p < .05$, was explained for females. These results indicate that task orientation explains a statistically significant amount of variance in effort for both males and females. However, in this sample, more variance is explained for females than for males. Thus, task goal orientation is a stronger predictor of effort for girls than boys.

Ego Goal Orientation, Perceived Competence, and Effort. The relationships among ego goal orientation, perceived competence, and effort and the interaction of ego orientation and perceived competence were examined with a forced-entry, full hierarchical regression model. The main effects for ego orientation and perceived competence were entered followed by the interaction term. Although this combination of variables explained approximately 26% of the variance in effort, $R = .51$, F(3, 167) = 19.79, $p < .01$, none of the variables' individual contribution to the relationship reached statistical significance ($\beta_{ego} = —28$, $\beta_{pc} = .35$, $\beta_{ego\ x\ pc} = .30$), suggesting that ego goal orientation is a poor predictor of effort.

Gender, Goal Orientations, Perceived Competence, Intrinsic Interest, and Effort

Structural equation modeling (SEM) is a sophisticated statistical technique for testing theoretical models. However, the appropriateness of SEM is dependent upon sample size (Hayduk, 1982). The number of observations sufficient for testing with SEM is linked to the number of parameters estimated in a given model (Tanaka, 1987). That is, the complexity of the model determines the sample size appropriateness. The model put forth in this study is relatively complex given the number of observation *(N* = 174). Thus, an alternative strategy, causal path analysis, was employed to test the model presented in Figure l. The first step of the path analysis examined task orientation, ego goal orientation, perceived competence, and interest as predictors of perceived effort. Results revealed that three of these four variables, task goal orientation, perceived competence, and interest significantly related to effort. Path coefficients for these relationships can be seen in Figure 2. Overall, 41% of the variance in effort was explained by task orientation, perceived competence, and interest, $R = .64$, F(4, 164) = 28.72, $p < .01$. Higher scores on task orientation, perceived competence, and interest resulted in higher scores on effort. Students' ego goal orientation was not significantly related to effort.

The second step involved the regression of interest on task orientation, ego orientation, and perceived competence. Results of the analysis revealed task orientation and perceived competence were significantly related *($p < .01$)* to interest and explained 57% of the variance, $R = .75$, F(3, 165) = 72.37, $p < .01$. Higher levels of task orientation and perceived competence were associated with higher intrinsic interest scores. The causal path between ego and interest was not statistically significant.

The third step included the regression of perceived competence on gender, task orientation, and ego orientation. Both gender and task orientation predicted perceived competence and together explained 14% of the variance in perceived competence, $R = .39$, F(3, 165) = 8.77, $p < .01$. Higher task orientation scores were associated with higher scores in perceived competence, and in general, males reported higher levels of perceived competence than females. Ego goal orientation was not significantly related to effort.

The final step in this path analysis included the regression of task and ego goal orientation on grade. However, the causal paths among these variables were not statistically significant.

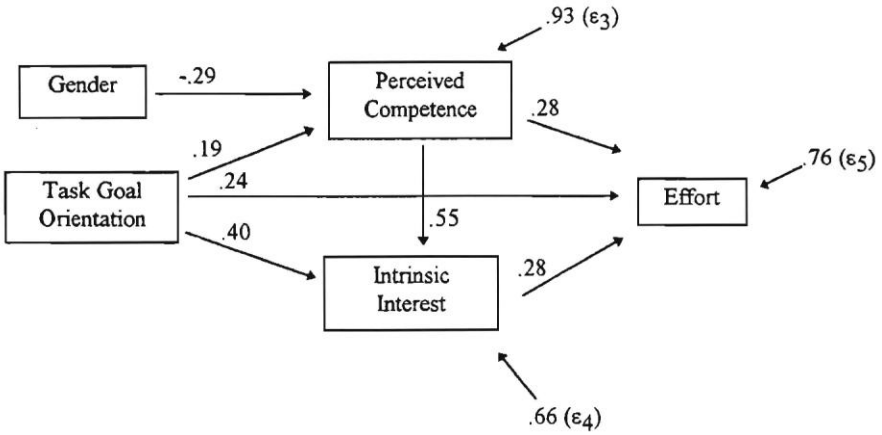

Figure 2 — Causal paths and coefficients of the relationships among goal orientations, perceived competence, intrinsic interest, and effort. The negative path coefficient between gender and perceived competence denotes that males scored higher on the perceived competence than females. Error terms were calculated by using the formula $(1 - R^2)^{1/2}$ (Pedhazur, 1982).

Table 3 Indirect and Total Effects of Gender, Task Orientation, and Perceived Competence on Intrinsic Interest and Effort

	Indirect effects[a]		Total effects[b]	
	Intrinsic interest	Effort	Intrinsic interest	Effort
Gender	−.16	−.03	−.16	−.03
Task orientation	.11	.19	.35	.43
Perceived competence	—	.15	.55	.43

[a]Indirect effects are calculated by multiplying the direct path coefficients that link two variables via mediating variables. [b]Total effects are the sum of the direct path coefficients and indirect effects.

In addition to the direct pathways given above, indirect effects were also assessed. Perceived competence exerted indirect effects on effort via interest. Task orientation and gender exerted indirect effects on interest and effort via their relationship with perceived competence. Indirect and total effects are given in Table 3.

Discussion

The purpose of the present study was twofold. First, the relationships among ego and task goal orientation, perceived competence, and effort were investigated as hypothesized by Nicholls (1984; Nicholls & Miller, 1984). Only one hypothesis, the positive relationship between task goal orientation and effort, was supported. Support for this hypothesis reinforces the contention that task-oriented individuals perceive themselves as trying hard and persisting in physical games and sport. Although task orientation was a good predictor of effort for the total sample, it was a stronger predictor for girls than for boys.

The second hypothesis concerning the relationships among ego goal orientation, perceived competence, and effort was not supported. The interaction between ego orientation and perceived competence failed to adequately explain effort. Specifically, neither ego orientation nor the interaction of ego orientation and perceived competence influence perceptions of competence or effort while playing games and sport.

Overall, participants in this study were high in both task goal orientation and perceived competence despite their scores in ego goal orientation. More importantly, high task, high perceived competent children believed they exerted high effort regardless of whether they were high or low in ego goal orientation. Thus, task goal rather than ego goal orientation may be a more salient construct when children are evaluating their perceived

competence and judging how much effort they exert. These results support Duda (1988) and Fox, Goudas, Biddle, and Duda (1994), who found that sport participants high in task and ego goal orientation demonstrate adaptive motivated behavior. Although we assume that public evaluation and the goal of winning inherent in sport and physical games foster an ego goal orientation, students' belief that ability is gained and demonstrated via learning and improving may be more salient than outperforming others, and it is this task goal orientation that fosters their perceptions of competence.

The second purpose of the present study was to test a model of the relationships among goal orientations, perceived competence, intrinsic interest, and effort. The results of the path analysis supported previous empirical studies demonstrating the direct and positive links between task goal orientation and (a) perceived competence (Duda & Nicholls, 1992; Seifriz et al., 1992), (b) intrinsic motivation/ interest (Duda et al., 1995; Duda et al., 1993), and (c) effort (Duda et al., 1995). Moreover, perceived competence and intrinsic interest served as strong mediating variables in the task orientation—effort relationship, demonstrating that individuals high in task orientation are more apt to experience feelings of competence. Feelings of competence lead to greater intrinsic interest, which in turn leads to greater effort. Conversely and congruent with previous research (Duda et al., 1990; Duda et al., 1995; Seifriz et al., 1992), ego orientation did not have any significant debilitating effects on perceived competence, intrinsic motivation/ interest, and effort. Again, this may be due to the salience of individuals' identification with a task goal orientation when engaged in physical activity.

Similar to the results found by Brustad (1993), Duda et al. (1995), and Eccles and Harrold (1991), boys in the present study were higher in perceived competence than were girls. This difference seems to have powerful ramifications on boys' and girls' levels of interest and effort. Specifically, because girls are lower in perceived competence, they are not as interested in physical games and sports, and thus, they do not exert as much effort as boys. Brustad (1993) found that children's perceptions of competence were mediated by their parents' encouragement to be physically active. He suggested that efforts to increase girls' perceived competence need to come from home and hints that other significant adults, such as teachers or coaches, may also influence a child's perceived competence. However, this has not yet been empirically tested.

The relationships among goal orientations, perceived competence, and effort are at the core of Nicholls's goal perspective theory and perceived competence is posited by Deci and Ryan (1985) to impact intrinsic motivation (Vallerand & Reid, 1984). Interestingly, however, few researchers have examined the relationships among these variables in achievement models such as Nicholls's theory (Butler, 1987, 1989; Duda et al., 1993; Duda et al., 1995). The present study attempted to integrate and investigate the interrelationships among the shared and unique constructs set forth by the goal perspective and intrinsic motivation theories. The results of this study suggest such endeavors will be facilitated by examining the relationships among the dimensions of intrinsic motivation as measured by the IMI. Future research would also be well served by employing larger samples and structural equation modeling techniques. Such procedures can provide more information concerning the nature of the interrelationships among variables while accounting for measuring error (Jöreskog & Sörbom, 1988).

This study and current goal perspective research have examined the dispositional nature of goal orientation. This area of study has been informative; however, examination of situational effects on goal orientation, or more appropriately goal involvement, may provide additional information concerning the role of perceived competence in motivated behavior. According to Nicholls (1989), task involvement is the state associated with the goal of demonstrating competence via learning and improving. In contrast, ego involvement is the state associated with the goal of demonstrating competence by outperforming others.

Given the public and evaluative nature of physical activity, engagement in such activity should be highly ego inducing. Interestingly, however, the majority of children identify more strongly with a task than an ego orientation (Duda et al., 1995; Duda et al., 1993; Duda & Hom, 1993; Williams, 1994). The TEOSQ measures dispositional goal orientations and is typically assessed in neutral situations (e.g., in a classroom, prior to a practice). It may be that children can be in a state of task or ego involvement in a given situation regardless of their particular dispositional goal orientation. For example, a child who is disposed to task goal orientation may

become ego involved in highly competitive and evaluative situations such as a practice in which the starters for a game will be decided or during an important game. Conversely, someone who is disposed to an ego orientation may become task involved in practice or during a pick-up game (Ames, 1992; Duda, 1992; Nicholls, 1984). We should continue to research the influence of dispositional goal orientations on behavior and begin to place greater emphasis on researching situationally induced goal perspective (i.e., goal involvement) and its relationship with motivated behavior.

References

Ames, C. (1984). Competitiveness versus cooperative reward structures: The influence of individual and group performance factors on achievement attributions and affect. In R. Ames & C. Ames (Eds.), *Research on motivation in education: Student Motivation* (pp. 177-207). New York: Academic Press.

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G.C. Roberts (Eds.), *Motivation in sport and exercise* (pp. 161-176). Champaign, IL: Human Kinetics.

Brustad, R. J. (1993). Who will go out and play? Parental and psychological influences on children's attraction to physical activity. *Pediatric Exercise Science,* 5, 210223.

Butler, R. (1987). On the psychological meaning of information about competence: A reply to Ryan and Deci's comment on Butler (1987). *Journal of Educational Psychology,* 79, 269-272.

Butler, R. (1989). Task-involving and ego-involving properties of evaluation: Effects of different feedback conditions on motivational perceptions, interest, and performance. *Journal of Educational Psychology,* 81, 474-482.

Burton, D. (1989). Winning isn't everything: Examining the impact of performance goals on collegiate swimmers' cognitions and performance. *The Sport Psychologist,* 3, 105-I32.

Chaumeton, N., & Duda, J.L. (1988). Is it how you play the game or whether you win or lose? The effect of competitive level and situation on coaching behaviors. *Journal of Sport Behavior, 11,* 157-174.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika,* 16, 697-334.

Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum Press.

Duda, J.L. (1988). The relationship between goal perspectives and persistence and intensity among recreational sport participants. *Leisure Sciences,* 10, 95-101.

Duda, J.L. (1989a). Goal perspectives, participation and persistence in sport. *International Journal of Sport Psychology,* 20, 42-56.

Duda, J.L. (1989b). Relationship between task and ego orientations and the perceived purpose of sport among high school athletes. *Journal of Sport & Exercise Psychology, 11,* 318-335.

Duda, J.L. (1992). Motivation in sport settings: A goal perspective approach. In G.C. Roberts (Eds.), *Motivation in sport and exercise* (pp. 57-91). Champaign, IL: Human Kinetics.

Duda, J.L., Chi, L., & Newton, M. (1990). *Psychometric characteristics of the TEOSQ.* A paper presented the national conference of the North American Society for the Psychology of Sport and Physical Activity, Houston, TX.

Duda, J.L., Chi, L., Newton, M.L., Walling, M.D., & Catley, D. (1995). Task and ego orientation and intrinsic motivation in sport. *International Journal of Sport Psychology,* 26, 40-63.

Duda, J.L., Fox, K.R., Biddle, S.J.H., & Armstrong, N. (1993). Children's achievement goals and beliefs about success in sport. *British Journal of Educational Psychology,* 62, 313-323.

Duda, J.L., & Horn, H.L. (1993). Interdependencies between the perceived and self- reported goal orientations of young athletes and their parents. *Pediatric Exercise Science,* 5, 234-241.

Duda, J.L., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology,* 84, I-10.

Duda, J.L., Olson, L.K., & Templin, T.J. (1991). The relationship of task and ego orientation to sportsmanship attitudes and perceived legitimacy of injurious acts. *Research Quarterly for Exercise and Sport,* 62, 79-87.

Duda, J.L., Smart, A., & Tappe, M. (1989). Personal investment in the rehabilitation of athletic injuries. *Journal of Sport & Exercise Psychology,* 11, 367-171.

Dweck, C. (1986). Motivational processes affecting learning. *American Psychologist,* 41,

1040-1048.
Eccles, J.S., & Harrold, R.D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology,* 3, 735.
Fox, K., Goudas, M., Biddle, S., & Duda, J.L. (1994). Children's task and ego goal profiles in sport. *British Journal of Educational Psychology,* 64, 253-261.
Horn, T.S. (1984). Expectancy effects in the interscholastic athletic setting: Methodological considerations. *Journal of Sport Psychology,* 5, 60-76.
Harter, S. (1982). The perceived competence scale for children. *Child Development,* 53, 87-97.
Hayduk, L.A. (1989). *Structural equationmodeling with LISREL: Essentials and advances.* Baltimore, MD: Johns Hopkins University Press.
Jöreskog, K.G., & Sörbom, D. (1988). *LISREL 7: A guide to the program and applications.* Chicago, IL: SPSS.
Marsh, H. (1994). Sport motivation Orientations: Seward of the jingle jangle fallacies. *Journal of Sport & Exercise Psychology,* 16, 365-380.
McAuley, E., Tammen, V. (1989). The effects of subjective and objective competitive outcomes on intrinsic motivation. *Journal of Exercise & Sport Psychology,* 11, 8493.
McAuley, E., Wraith, S., & Duncan, T.E. (1991). Self-efficacy, perceptions of success, and intrinsic motivation for exercise. *Journal of Applied Social Psychology,* 21, 139-155.
Nicholls, J.G. (1984). Conceptions of ability and achievement motivation. In R.E. Ames & C. Ames (Eds.), *Research on motivation in education: Vol. l. Student motivation* (pp. 39-73). New York: Academic Press.
Nicholls, J.G. (1989). *The competitive ethos and democratic education.* Cambridge, MA: Harvard University Press.
Nicholls, J.G., & Miller, A.T. (1984). Development and its discontents: The differentiation of the concept of ability. In J.G. Nicholls (Eds.), *Advances in motivation and achievement: The development of achievement motivation* (pp. 185-218). Greenwich, CT: JAI Press.
Pedhazur, E.J. (1982). *Multiple regression in behavioral research.* Fort Worth, TX: Harcourt Brace College.
Roberts, C.G. (1992). Motivation in sport and exercise: Conceptual constraints and convergence. In C.G. Roberts (Eds.), *Motivation in sport and exercise* (pp. 3-29). Champaign, IL: Human Kinetics.
Ryan, E.D. (1977). Attribution, intrinsic motivation and athletics. In L.I. Gedvilas & M.E. Kneer (Eds.), *Proceedings of the National Association for Physical Education of College Men National Conference Association. for Physical Educational of College Women National Conference* (pp. 346-353). Chicago: University of Illinois at Chicago Circle.
Ryan, E.D. (1980). Attribution, intrinsic motivation, and athletics: A replication and extension. In C.H. Nadeau, W.R. Halliwell, K.M. Newell, & G.C. Roberts (Eds.), *Psychology of motor behavior and sport-1979* (pp. 19-26). Champaign: Human Kinetics.
Ryan, R.M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology,* 45,435- 449.
Seifriz, J.L., Duda, J.L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport & Exercise Psychology,* 14, 375-391.
Tanaka, J. S. (1987). "How big is big encough?" Sample size and goodness of fit in structural equation models with latent variables. *Child Development,* 58, 134-146.
Thomas, J.R., & Tennant, L.K. (1978). Effects of rewards on children's motivation for an athletic task. In F.L. Smoll & R.E. Smith (Eds.), *Psychological perspectives in youth sports* (pp. 123-144). Washington, DC: Hemisphere.
Treasure, D., & Roberts, G.C. (1994) Cognitive and affective concomitants of task and ego orientations during middle school years. *Journal of Exercise & Sport Psychology,* 16, 15-28.
Vallerand, R.J., & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of the cognitive evaluation theory. *Journal of Sport Psychology,* 6, 94-102.
Weiss, M.R. (1987). Self-esteem and achievement in children's sport and physical activity. In D. Gould & M. R. Weiss (Eds.), *Advances in pediatric sport sciences: Vol. 2. Behavioral issues* (pp. 87-119). Champaign, IL: Human Kinetics.
Williams, L. (1994). Goal orientations and athletes' preferences for competence information sources. *Journal of Sport & Exercise Psychology,* 16, 416-430.