

## Global self-esteem, goal achievement orientations, and self-determined behavioural regulations in a physical education setting

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### Abstract

We examined a theoretical model of global self-esteem that incorporated constructs from achievement goal and self-determination theories. The model hypothesized that self-determined or autonomous motives would mediate the influence of achievement goal orientation on global self-esteem. The adapted version of the Behavioural Regulation in Exercise Questionnaire (Mullan *et al.*, 1997), the Perception of Success Questionnaire (Roberts & Balague, 1991), and Rosenberg's (1965) self-esteem scales were administered to 634 high school students aged 11–15 years. A structural equation model supported the hypotheses and demonstrated that autonomous motives mediated the effect of goal orientations on global self-esteem. The results suggest that generalized motivational orientations influence self-esteem by affecting autonomous motivation and is consistent with theory that suggests that experiences relating to intrinsic motivation are the mechanism by which global motivational orientations are translated into adaptive outcomes like self-esteem. The findings suggest that physical activity interventions that target autonomous motives in physical activity contexts are likely to enhance young people's general self-esteem.

**Keywords:** *Self-esteem, achievement goals, autonomous motives, physical education*

### Introduction

A number of motivational theories have highlighted the role of global and domain-specific self-evaluations on achievement-related outcomes, such as increased physical activity behaviour (Deci & Ryan, 1985; Harter, 1978; Nicholls, 1989). For example, research in the physical domain has found that self-esteem is associated with motivated behaviour in physical activity settings (Biddle *et al.*, 1993; Fox, 1997; Goudas, Biddle, & Fox, 1994; Marsh, Richards, Johnson, Roche, & Tremayne, 1994; Whitehead & Corbin, 1991) and with physical activity behaviour (Crocker, Eklund, & Kowalski, 2000; Hagger, Ashford, & Stambulova, 1998; Hayes, Crocker, & Kowalski, 1999; Thøgersen, Fox, & Ntoumanis, 2002; Tremblay, Inman, & Willms, 2000; Welk & Eklund, 2003). However, to date, few researchers have investigated the effect of the motivational climate operating in an educational context, such as physical education classes, on global self-esteem (Kavussanu & Harnisch, 2000; Treasure & Biddle, 1997).

Research has shown that high self-esteem may be an important outcome of performing well in school (for a review, see Baumeister, Campbell, Krueger, & Vohs, 2003). Fox (2000) reported that high self-esteem is associated with choice, persistence, and success in a broad range of achievement and health-related behaviours. School physical education is a context in which almost all students engage in physical exercise. Therefore, it is a useful context to study the effects of students' perceptions of the physical education environment on self-esteem. The purpose of the present study was to test a mediational model that details the hypothesized effects of constructs from two theories of motivation – achievement goal and self-determination theory – on global self-esteem.

### *Achievement goal theory*

Achievement goal theory is a social psychological model that aims to understand the role of generalized motivational orientations regarding competence on behavioural and psychological outcomes (Fox & Corbin, 1989; Kowalski, Crocker, Kowalski, Chad, &

Humbert, 2003; Marsh *et al.*, 1994; Sonstroem, 1998). Central to the theory is the individual's view of competence and the effect of environment or *motivational climate* – the social environment in which an actor operates – on subsequent motivational orientations and actions. According to the theory, a person can hold two views of competence in achievement situations and this gives rise to two distinct but related motivational orientations. These orientations are termed “task orientation” and “ego orientation”. For task-oriented individuals the criterion for the evaluation of competence is self-mastery, whereas in the case of ego orientation competence is based on outperforming others and demonstrating superior ability. Both orientations can lead to high perceptions of competence – a person that feels competent in domains where he or she aspires to excel is likely to feel successful. However, under conditions of failure, individuals with high ego orientation and low task orientation tend to feel incompetent because they are unsuccessful according to the set criterion for success – being superior relative to a normative standard or bettering others. They have no mastery goals to fall back on and therefore tend to avoid or drop out of the activity due to low perceptions of success.

It is important to note that researchers have made the distinction between goal orientations, which operate at a distal, global level and affect perceived competence and behaviour across a number of behavioural domains, including exercise, and situational or “involved” goal perspectives, which operate in specific contexts (Harwood, 2002). Theory states that perceptions of goal involvement are a function of the general goal orientation profile adopted at the dispositional level as well as situational factors that could affect perceptions of competence in a given context. The context-level constructs that influence an individual's goal involvement profile – task-oriented, ego-oriented, or a combination of the two – is determined by the *motivational climate* operating in that context.

Motivational climate is the social environment operating in achievement contexts fostered by significant others, such as physical education teachers, and can also be characterized as task-oriented or ego-oriented (Nicholls, 1989; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Seifriz, Duda, & Chi, 1992). In task-oriented motivational climates, personal mastery goals are highlighted and students tend to adopt a task-oriented situational goal orientation (Papaioannou, 1995). In this case, students will strive to develop self-referenced competence or gain mastery of the task. Several authors have agreed that perceived competence is the most influential predictor of intrinsic motivation or interest among adolescent students in physical education (e.g. Ferrer-Caja & Weiss, 2000, 2002; Ntoumanis,

2001; Standage, Duda, & Ntoumanis, 2003). In the case of an ego-oriented motivational climate, students tend to adopt a performance-orientated situational goal orientation and strive to demonstrate superior ability relative to peers. According to the theory, if success in winning or outperforming others is not met, then individuals in an ego-oriented motivational climate are less likely to persist, as they are less likely to have alternative mastery-oriented goals from which to derive alternative criteria for success.

To date, achievement goal theory has been widely used to study students' perceptions of the motivational climate operating in their physical education class. Significant relationships between the two goal orientations (task and ego) and motivation (Goudas *et al.*, 1994; Papaioannou, 1995; Standage & Treasure, 2002; Treasure, 1997; Wang & Biddle, 2001) and physical activity behaviour (Dempsey, Kimiecik, & Horn, 1993; Wang & Biddle, 2001) have been established. Treasure and Roberts (2001) have shown that the two goal orientations are related to different behavioural and affective motivational responses in students, such as choice of task difficulty, enjoyment, and satisfaction. Several positive motivational outcomes, such as intrinsic motivation (Mitchell, 1996) and the belief that effort leads to success (Solmon, 1996), have been reported to be associated with a task orientation. In contrast, students with a high ego orientation have been shown to have lower intrinsic motivation (Papaioannou, 1995). However, some researchers have shown that motivation will also be high for ego-oriented individuals when perceived competence is high (Cury, Biddle, Sarrazin, & Famose, 1997). Therefore, it is possible that participants may hold equally high task and ego orientations, which could lead to these orientations being highly correlated.

A few researchers have examined the influence of achievement goal orientation and perceived physical ability on global self-esteem. Treasure and Biddle (1997) found that task orientation predicted global self-esteem both directly and indirectly through perceived ability and physical self-worth. Kavussanu and Harnisch (2000) investigated the relationships between global self-esteem and goal orientations in athletes. They found that high task-oriented children reported significantly higher self-esteem than low task-oriented children. This limited evidence seems to suggest that a task orientation may have an influence on self-esteem.

#### *Self-determination theory*

Self-determination theory (SDT; Ryan & Deci, 2000) identifies several distinct types of motivation, each of which has specifiable consequences for learning, performance, personal experience, and

well-being. These different types of motivation or behavioural regulations comprise a self-determination continuum. The continuum is posited to run from low to high self-determination as one moves from extrinsic motivation at one extreme to intrinsic motivation at the other (Deci & Ryan, 1985). The external regulation construct represents the least self-determined form of extrinsic motivation and involves exercising to satisfy an external requirement. Introjected regulation involves motivation to exercise to avoid negative feelings or to promote conditional self-worth. Identified regulation characterizes participating in exercise to obtain personally valued benefits, whereas intrinsic motivation reflects participation that is undertaken volitionally for the pleasure and interest derived from engaging in the exercise itself (Deci & Ryan, 1985; Ryan & Deci, 2000). External regulation and introjected regulation are typically viewed as controlling types of behavioural regulation, whereas intrinsic motivation and identified regulation are characterized as more autonomous types of behavioural regulation. In the context of sport and exercise, a recent meta-analysis has supported the discriminant validity and hypothesized pattern of relationships among the SDT continuum components (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003).

In addition to discerning between the quality of motivation in self-determination continuum, self-determination theory outlines how psychological needs form the origins of such motivational orientations. According to self-determination theory, human behaviour is controlled by the satisfaction of three fundamental psychological needs (autonomy, competence, and relatedness). The need for autonomy is defined as an individual's effort to determine his or her own behaviour. The need for competence was described as an individual's striving to experience effectance. The need for relatedness was defined as an individual's attempt to have satisfying and coherent involvement with others. Behaviours that are performed for autonomous reasons (intrinsic motivation and identified regulation) are deemed the type of behaviours that satisfy psychological needs, and engaging in such behaviours will result in positive emotional and psychological outcomes such as non-contingent self-esteem and positive affect. Importantly, the effects of psychological needs on motivational orientations from the SDT contexts is viewed as the effect of global, dispositional tendencies on more changeable, context-level motivational orientations (Hagger, Chatzisarantis, & Harris, 2006; Vallerand, 1997). These researchers suggest that the satisfaction of basic psychological needs affects motivational orientations from the SDT continuum in a top-down fashion and affects motivational orientations in several contexts. The nature of the top-down

influence between psychological need satisfaction and contextual-level motivation is similar to the distinction between goal orientations and involvement outlined by Harwood (2002).

The motivational orientations from self-determination theory have also been implicated in influencing non-contingent self-esteem as an outcome variable in research regarding self-esteem not to be contingent on any discernible outcome, in contrast to contingent self-esteem (Crocker & Luhtanen, 2003). Self-esteem that is contingent on the performance of a behaviour itself has a controlling rather than informational function. In this respect, contingent self-esteem is more akin to controlling rather than autonomously motivational orientations. Non-contingent self-esteem, on the other hand, is not dependent upon performance of the behaviour; rather, it is an enhanced sense of self-worth as a result of performing the behaviour for autonomous reasons. Deci and Ryan suggest that self-perceptions are developed on the basis of previous experience with autonomously motivated behaviours. Autonomously motivated behaviour is certainly an outcome of a self-determined motivational orientation, but since such orientations also reflect a high degree of personal agency and self-directed interest in the task, they are likely to result in positive psychological outcomes such as non-contingent self-esteem. For example, the need for autonomy reflects an individual's desire to be a causal agent in their world, and if a behaviour satisfies the need for autonomy, the individual feels a sense of personal choice and "ownership" over their actions. Furthermore, the need for competence is satisfied through the pursuit of autonomously motivated behaviours that lead to personal perceptions of success. As such, autonomous motivational orientations may also influence self-esteem as an outcome as well as motivated behaviour. Links between the types of motivation from self-determination theory and the level of self-esteem have been reported by Kernis, Paradise, Whitaker, Wheatman and Goldman (2000). These authors found that global perceptions of self-worth were negatively associated with external and introjected regulations and positively associated with identified regulation and intrinsic motivation. Recently, Wilson and Rodgers (2002) examined the relationship between the exercise motives from self-determination theory and physical self-esteem in physically active females. They reported that more autonomous exercise motives were positively related to physical self-esteem.

#### *Integrating the theories*

Several authors have identified similarities between self-determination theory and achievement goal

theory (e.g. Butler, 1987; Ntoumanis, 2001; Ryan & Deci, 1989; Standage *et al.*, 2003). At the level of basic psychological needs, these authors argued that high task orientation can fulfil one or more of the basic psychological needs from self-determination theory, especially autonomy and competence, and consequently enhance self-determined behaviour. Conversely, a high ego orientation can thwart an individual's striving to satisfy his or her psychological needs. The controlling features of ego orientation, such as the attainment of approval and rewards and the demonstration of superior ability relative to others, do not allow individuals to feel that their behaviour is controlled by oneself.

This pattern of association is also seen at the level of the motivational regulations among people involved with achievement-oriented behaviours in given contexts. According to achievement goal theory, task-involved people are focused on the mastery of an activity and are more likely to find the task interesting and choose to engage in the activity again (i.e. they have high intrinsic motivation). Ego-involved people, on the other hand, are focused on proving that they are better than others and, in the face of failure, may lose interest in the task and experience reduced motivation to persist with it in the future (i.e. they will have low intrinsic motivation). According to Ryan (1982), ego involvement represents a kind of internal control or pressure that people apply to themselves similar to an introjected regulation on the SDT continuum. He argued that being pressured by these internal constraints (for instance, having to do well to prove one's self-worth) would yield motivational consequences similar to being pressured by external constraints. Empirical research has supported these claims. For example, Brunel (1999) showed that task orientation facilitated autonomous forms of motivation, while ego orientation was positively related to external and introjected regulations.

#### *The integrated model*

In the present study, we propose an integrated model incorporating two theories of motivation – self-determination theory and achievement goal theory – to examine influences on global self-esteem. The suggestion is that given the triadic links between dispositional goal orientations at the global level, the motivational orientations from the SDT continuum at a contextual level, and generalized non-contingent self-esteem, that the theories might offer complementary explanations for the influences on global self-esteem. As outlined previously, self-esteem can be considered an outcome of both sets of motivational constructs. Generalized goal orientations are likely to have an effect on self-esteem because self-esteem is related to competence. If an individual

feels competent about performing competitive tasks, then he or she is more likely to have higher self-esteem. In addition, autonomous forms of motivation, especially identified regulation, are likely to result in high self-esteem because such behaviours attend to personally valued goals and these satisfy needs for competence. However, as outlined in previous research, a task-oriented goal orientation may lead to autonomous motivational orientations at the context level because such orientations foster interest in the activity because the focus is on the actual task rather than external outcomes. It is therefore proposed that generalized goal orientations influence context-level motivational tendencies or regulations, which in turn results in higher contingent self-esteem. Therefore, the reason why dispositional goal orientations affect self-esteem is because they affect individuals' tendency to engage in activities for autonomous reasons and such experiences will contribute to the formation of self-esteem. In this way, autonomous motives may act as the *mechanism* through which goal orientations affect self-esteem. As such, the integration of achievement goal theory with self-determination theory may help to gain a better understanding of the “forming/building” process of self-esteem in school physical education classes. We hypothesized that autonomous motivation from self-determination theory mediates the effect of goal orientations on self-esteem.

## **Methods**

### *Participants and procedures*

The participants were school children (340 males, 294 females) aged 11–15 years ( $12.9 \pm 1.37$  years; mean  $\pm$  s) from towns in Estonia. This age group was selected because several researchers (Harter, 1998; Rosenberg, 1986) have suggested that instability and change in self-perceptions are common during this period of development. Students were taking physical education as a required course (twice a week). Permission to carry out the study in each school was obtained from the headteacher and ethical approval was granted from the university ethics committee. The questionnaire was uploaded to the internet and information about the website address was forwarded to each school's headteacher. Next, consent from class teachers was obtained in lieu of parental consent. The purpose of the study was explained and the guidelines for completing the questionnaire were also given. It was also emphasized that the questionnaire was designed to measure students' general feelings about *physical education* classes and not about one particular class. The questionnaire, which took approximately 10–12 min to complete, was administered in quiet classroom

conditions. The students were assured that their answers would remain confidential.

### Measures

*Global self-esteem.* Rosenberg's (1965) self-esteem scale was used to assess global self-esteem. The scale consists of 10 items measured on 5-point scales. Five of the items were positively worded and five items were negatively worded. The internal reliability of this scale was satisfactory (Cronbach's  $\alpha = 0.72$ ).

*Motivational orientations.* The Behavioural Regulation in Exercise Questionnaire (BREQ; Mullan, Markland, & Ingledew, 1997) was adapted for use in a physical education setting to measure different types of motivated behaviour. This questionnaire consists of four subscales: intrinsic motivation, identified regulation, introjected regulation, and external regulation. Responses were given on a 5-point Likert scale with anchors of "strongly disagree" (1) and "strongly agree" (5). The internal consistency of these scales was satisfactory in all cases (intrinsic motivation,  $\alpha = 0.84$ ; introjected regulation,  $\alpha = 0.78$ ; identified regulation,  $\alpha = 0.75$ ; external regulation,  $\alpha = 0.79$ ).

The four motivational constructs measured by items from the BREQ were integrated into a single index of autonomous motivation by calculating a relative autonomy index (RAI; Vallerand & Ratelle, 2002). This had the effect of reducing the overall number of variables in the model and maximizing the parsimony of subsequent models. Following the method advocated by previous researchers (e.g. Guay *et al.*, 2003), weights were assigned to each item from the intrinsic motivation (+2), identified regulation (+1), introjected regulation (-1), and extrinsic regulation (-2) scales, and three RAI items were calculated based on the weighted composite of these scores. These items were used as indicators of a single latent relative autonomy index (RAI) factor in subsequent analyses.

*Goal orientation.* The Perception of Success Questionnaire (POSQ; Roberts & Balague, 1991) was used to measure dispositional goal orientations. This inventory consists of two 6-item scales measuring dispositional task and ego orientation. Students responded on a 5-point Likert scale anchored by "strongly disagree" (1) and "strongly agree" (5). The internal reliability of these scales is adequate (task orientation,  $\alpha = 0.85$ ; ego orientation,  $\alpha = 0.89$ ).

### Data analysis

The discriminant and factorial validity of the subscales was examined using confirmatory factor

analysis, and the hypothesized effects of goal orientations and relative autonomy on global self-esteem was tested using structural equation modelling with LISREL version 8.51. The comparative fit index (CFI), non-normed fit index (NNFI), and root mean square error of approximation (RMSEA) were used to evaluate the adequacy of the models. A cut-off value close to 0.90 for the confirmatory fit index and non-normed fit index (Hoyle & Panter, 1995) and 0.08 for the root mean square error of approximation (Hu & Bentler, 1999) have been adopted as reasonable cut-off values for model fit.

## Results

### Preliminary analyses

Examination of the skewness and kurtosis values of the items revealed that not all data were normally distributed. Therefore, in subsequent confirmatory factor analyses and structural equation model analyses, we used the polychoric correlations and the asymptotic covariance matrices produced by PRELIS 2.51 to protect from departures from normality.

We conducted a confirmatory factor analysis to support the discriminant validity of the scales used in the present study. In the analysis, items representing the global self-esteem construct from the Rosenberg's self-esteem scale, the intrinsic motivation, identified regulation, introjected regulation, and extrinsic regulation scales from the BREQ, and the task and ego orientation scales from the POSQ were all set to indicate separate latent factors. One item for each factor was arbitrarily set to unity to define the scale of the factor and all factors were intercorrelated, as is the case in all confirmatory factor analytic models. Goodness-of-fit indices for this model indicated that there were some misspecifications (Table I, Model 1). Examining the solution estimates including the factor loadings suggested that the single global self-esteem factor was not adequately specified, with several loadings below 0.50. We therefore re-estimated the model but with a two-factor conceptualization of self-esteem in which the positively and negatively worded items from the self-esteem scale loaded on separate factors as recommended by others (Bachman & O'Malley, 1986; Kaufman, Rasinski, Lee, & West, 1991). This model exhibited adequate fit with the data and acceptable solution estimates for the two global self-esteem factors (Table I, Model 2). Marsh (1996) stated that the positively and negatively worded items from Rosenberg's scale presented methodological problems and suggested that the positively worded items alone be used to indicate the global self-esteem construct. We followed this recommendation and re-estimated the model using only these items to

Table I. Results of confirmatory factor analysis (CFA) and structural equation modelling.

Models	NNFI	CFI	RMSEA	RMSEA 95% CI	SB- $\chi^2$ (d.f.)
<b>Confirmatory factor analyses</b>					
Model 1	0.81	0.83	0.082	0.079–0.085	3025 (53)
Model 2	0.89	0.90	0.055	0.052–0.058	1736 (601)
Model 3	0.90	0.91	0.058	0.055–0.062	1398 (443)
Model 4	0.91	0.92	0.064	0.058–0.070	589.1 (164)
Model 5	0.91	0.92	0.066	0.060–0.071	615.6 (165)
<b>Structural equation models</b>					
Model 6	0.91	0.92	0.066	0.060–0.071	615.6 (165)
Model 7	0.90	0.91	0.070	0.064–0.075	676.6 (166)

Note: Model 1 = initial CFA with single-factor general self-esteem (GSE); Model 2 = CFA with two-factor global self-esteem; Model 3 = CFA with single-factor global self-esteem (positively worded items only); Model 4 = CFA including latent RAI factor; Model 5 = second-order goal orientations factor; Model 6 = hypothesized structural equation model; Model 7 = reduced structural equation model in which the path from RAI to global self-esteem is fixed to zero.

Abbreviations: NNFI = non-normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation, 95% CI = 95% confidence interval; SB  $\chi^2$  = Sattora-Bentler scaled chi-square; d.f. = degrees of freedom; RAI = relative autonomy index.

indicate global self-esteem. This resulted in a good model fit (Table I, Model 3).

The adequate solution estimates for the individual scales of the BREQ constructs supported the validity of the subsequent use of the constituent items to compute the items for the RAI construct. We therefore re-estimated the model using the RAI items to indicate a latent autonomous motivation construct (Table I, Model 4). This model exhibited adequate fit with the data and the solution estimates indicated that the latent RAI factor was adequately represented.

Correlations among the latent variables for Model 4 are shown in Table II. The very strong correlation between the task and ego orientation constructs ( $\rho = 0.69$ ) suggested that these factors were not distinct and may represent sub-factors of a global goal orientation factor. In addition, the existence of such a correlation may introduce multicollinearity in subsequent tests, thereby confounding the findings of subsequent structural models. As a consequence, the CFA model was respecified so that the task and ego orientation factors were set as indicators of a second-order goal orientation factor. This model also demonstrated acceptable fit with the data (Table I, Model 5) and is presented in Figure 1. The second-order goal orientations factor exhibited high and significant second-order factor loadings that indicated that both constructs were contributing highly to the global goal orientations factor. This second-order factor therefore represents a generalized motivational orientation for success that reflects both types of goal.

#### Structural equation model

The main purpose of the present study was to test the hypothesis that achievement goal orientations and

Table II. Factor correlations among the study variables.

	1	2	3
1. Global self-esteem	–		
2. Ego orientation	0.49	–	
3. Task orientation	0.69	0.68	–
4. Relative autonomy index	0.47	0.01	0.27

autonomous motives expressed by the relative autonomy index would affect the global self-esteem. Therefore, structural relationships representing the hypothesized relationships among the constructs from Model 5 were set to be free. The hypothesized structural equation model that illustrates both the direct effect of goal orientation on global self-esteem and the direct effect of goal orientation on global self-esteem via the mediation of RAI is presented in Figure 2 and the goodness-of-fit statistics are given in Table I (Model 6). Both the RAI ( $\beta = 0.32$ ,  $P < 0.01$ ) and goal orientation ( $\beta = 0.63$ ,  $P < 0.01$ ) factors had significant direct effects on global self-esteem and accounted for 60% of the variance in this construct. In addition, a Sobel (1982) test indicated that there was a significant indirect effect of goal orientations on global self-esteem via RAI ( $\beta = 0.08$ ,  $P < 0.01$ ), which is suggestive of a mediation relationship as hypothesized.

To confirm the hypothesis that the RAI construct mediated the direct effects of the goal orientation construct on global self-esteem, several tests were conducted according to Baron and Kenny's (1986) criterion. There are four criteria that require satisfaction for mediation to be supported: (1) the dependent variable (in this case, global self-esteem) should be correlated with the independent or

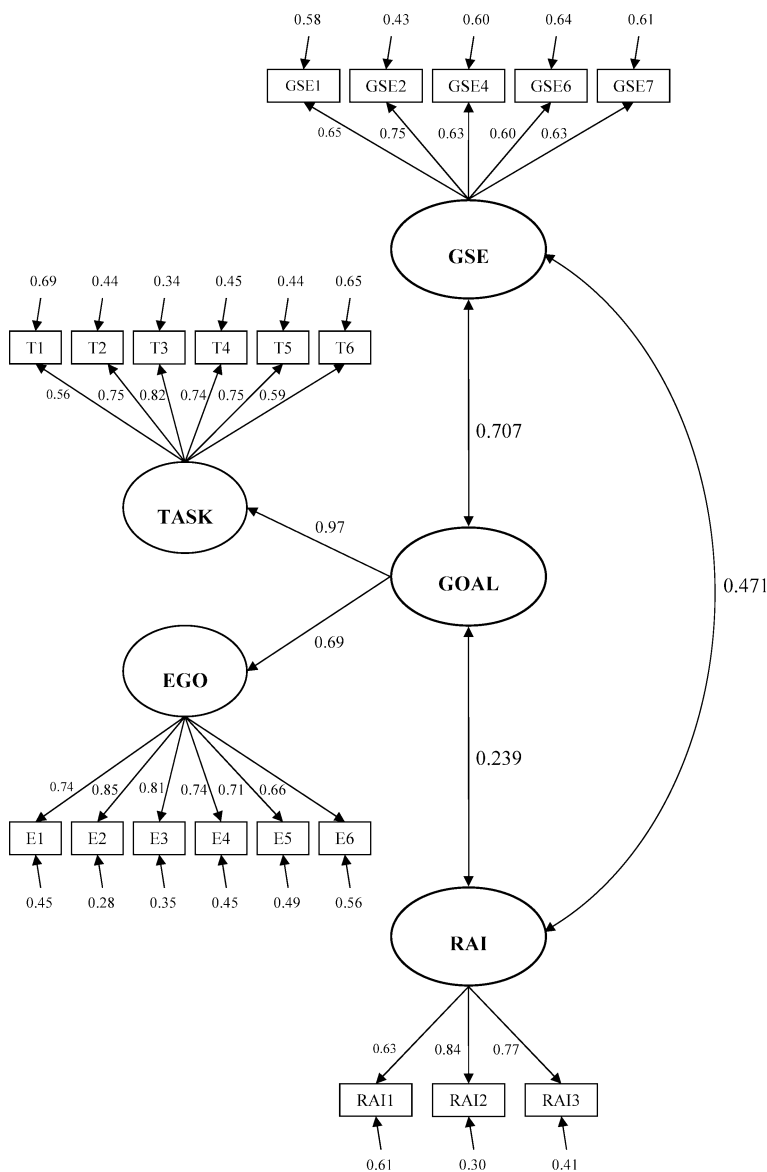


Figure 1. Higher-order confirmatory factor model. GOAL=global goal orientation factor; GSE=global self-esteem; EGO=ego orientation; TASK=task orientation; RAI=relative autonomy index. All paths are statistically significant ( $P < 0.05$ ).

predictor variable (goal orientation); (2) the mediator (RAI) should be correlated with the independent variable (goal orientation); (3) the mediator (RAI) should have a significant unique effect on the dependent variable (global self-esteem) when it is included alongside the independent variable (goal orientation) in a multivariate test of these relationships; and (4) the effect of the independent variable (goal orientation) on the dependent variable (global self-esteem) should be significantly attenuated or nullified when the mediator is included as an independent predictor of the dependent variable (Baron & Kenny, 1986).

In the final CFA model (Figure 1), the goal orientation construct was significantly correlated with both the global self-esteem and RAI constructs

satisfying the first two criteria for mediation. Furthermore, the significant RAI → global self-esteem path satisfied the third criterion for mediation (Figure 2). Finally, to confirm the fourth criterion, an alternative model (Table I, Model 7) was estimated in which the direct path from RAI to global self-esteem was fixed to zero. In accordance with expectations, the direct effect of goal orientation on global self-esteem was increased ( $\beta = 0.73$ ,  $P < 0.01$ ) in this model, indicating that partial mediation occurred. This difference was significant, as demonstrated by a change in the likelihood ratio test ( $\Delta\chi^2 = 61.03$ ,  $P < 0.01$ ) between the model that included this path as a free parameter (Model 6) and the model that did not (Model 7). In addition, Model 6 accounted for a greater proportion of the

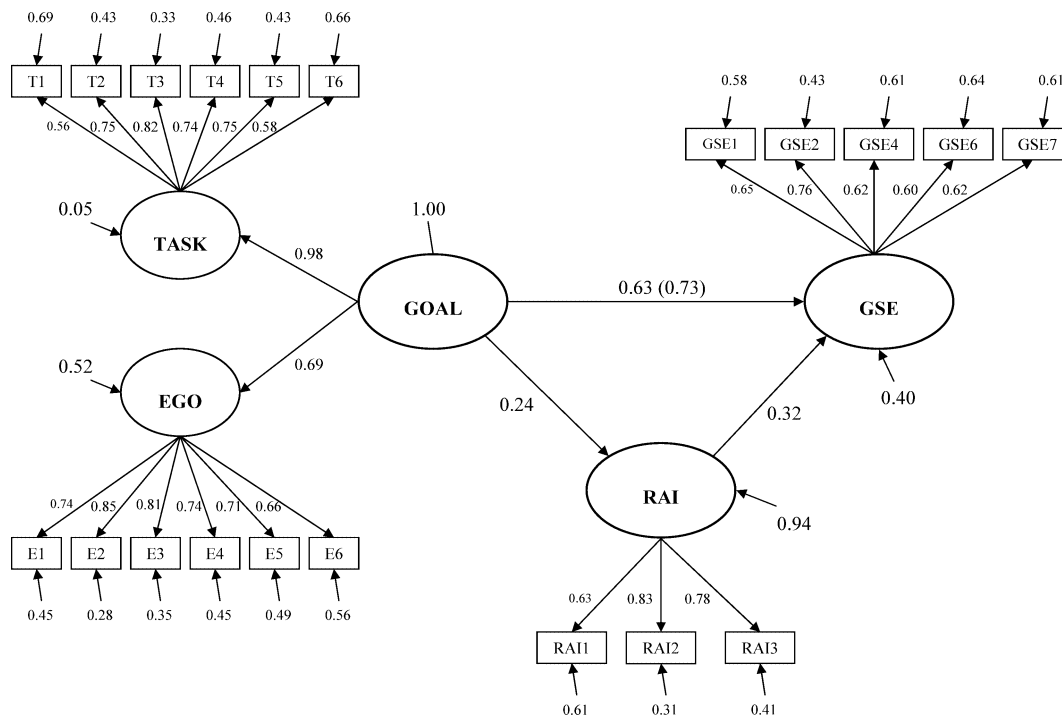


Figure 2. Structural equation model showing the direct effect of goal orientation on global self-esteem and the indirect effect via the mediation of autonomous motives. GOAL = global goal orientation factor; GSE = global self-esteem, EGO = ego orientation, TASK = task orientation; RAI = relative autonomy index. All paths are statistically significant ( $P < 0.05$ ). The path coefficient in parentheses represents the effect of goal orientation on global self-esteem in the alternative model in which the path from RAI to GSE was fixed to zero.

variance in global self-esteem (60%) than Model 7 (53%). These results therefore suggest that autonomous motives partially explain the effects of goal orientations on global self-esteem.

## Discussion

In this study, we investigated a mediational model in which goal orientations from achievement goal theory affected global self-esteem via the mediation of autonomous motives from self-determination theory. Preliminary confirmatory factor analyses supported the validity and factor structure of the measures of self-esteem, goal orientation, and self-determined motivation. However, the global self-esteem scale was found to be multidimensional, so only positively worded items were used in the final analysis following the suggestion made by Marsh (1996). Furthermore, the confirmatory factor analysis revealed the existence of a strong correlation between ego and task orientation that is not consistent with several previous findings (Kavussanu & Harnisch, 2000; Wang & Biddle, 2001). One explanation for this may be the tendency for the sample to endorse each of the orientations highly in terms of the way they approach their tasks in physical education. The results of subsequent confirmatory factor analyses supported the introduction of a higher-order global goal orientations factor that

adequately accounted for the two subordinate factors that represented the two orientation types.

The present results suggest some unique, direct effects for autonomous motives and goal orientations on global self-esteem. The effect of autonomous motives on global self-esteem is consistent with the findings of Wilson and Rodgers (2002), who showed that the autonomous motives of female exercise participants had a significant, positive influence on physical self-esteem. The direct effect of goal orientations on global self-esteem has also been reported elsewhere. For example, Kavussanu and Harnisch (2000) found that task orientation was a significant influence on global self-esteem, and Treasure and Biddle (1997) found that both orientations influenced physical self-worth. This suggests that both these orientations account for levels of overall self-esteem among children in physical education.

In addition, the *a priori* hypothesis that the effects of general achievement goal orientation on general self-esteem would be mediated by autonomous motives was supported in the present study. The final structural equation model showed that goal orientation comprising both task and ego goal orientations predicted global self-esteem both directly and indirectly through autonomous types of behavioural regulation and accounted for 60% of the variance in global self-esteem. A general achievement orientation, regardless of its nature, influences self-esteem



and it does so directly and indirectly through autonomous motives. This suggestion corroborates and extends the findings of Treasure and Biddle (1997), who found that the effect of ego orientation on physical self-worth was mediated via perceived ability. This notion is in line with the present results, which suggest that autonomous motivation, which has been shown to be strongly correlated with perceived ability (Kavussanu & Roberts, 1996; Newton & Duda, 1999; Wang & Biddle, 2003), mediates the goal orientation – self-esteem relationship.

According to theory, the integration of these two models provides some evidence of the mechanism or process by which dispositional orientations from achievement goal theory affect global self-esteem. It seems that the influence is partly accounted for by the effect of autonomous motivation on self-esteem. However, the effect of this indirect path was in addition to the direct effect, suggesting a dual influence of goal orientations on self-esteem. It appears therefore that one route to influencing self-esteem is through the effect of generalized goal orientations on the formation of autonomous motives, which in turn can enhance self-esteem. This is because goal orientations are associated with high perceived competence, a hallmark of autonomous motivation (Ryan & Deci, 2000). Individuals with high competence are likely to have high autonomous motivation towards the behaviour and are also likely to have high self-esteem (Crocker & Luhtanen, 2003), as evidenced by the present results. However, goal orientations also lead directly to self-esteem. The direct route may therefore reflect the spontaneous formation of self-esteem independent of the motivational processes that drive autonomously motivated behaviour.

The present results also provide some preliminary evidence that general self-esteem can be affected by domain-specific motivational orientations and that general-self esteem can be viewed as an outcome variable rather than a predictor variable. Although self-esteem is usually considered from a domain-specific perspective in multidimensional, hierarchical models of self-esteem (e.g. Fox & Corbin, 1989), the results of this study indicate that perceptions in a specific domain such as physical education may also have an effect on global self-esteem. Several researchers (Eklund, Whitehead, & Welk, 1997; Welk & Eklund, 2003; Maïano, Ninot, & Bilard, 2004) have also shown that subscales of perceived competence such as body attractiveness at the specific level are better correlated with the global-level self-esteem construct than the intermediate domain-level construct of physical self-worth.

In addition, it has been suggested that general self-esteem can act both as a predictor and a dependent (outcome) variable (Sedikides & Gregg, 2002), although research examining the role of self-esteem

as an outcome variable has not been extensive in the physical domain. Researchers have suggested that positive self-esteem in the physical domain may result in adherence or a continuation of behaviours such as physical activity (Hagger *et al.*, 1998). For example, Maïano *et al.* (2004) assumed that adolescents who do not feel good about themselves physically are likely to report being less motivated to participate in physical activities and sports. However, it is equally plausible that motivational factors and behaviour influence the formation and maintenance of self-esteem. This hypothesis is supported in the present study and suggests that motivational orientations in physical education may influence global self-esteem. It could be that the relationship between motivation, self-esteem, and behaviour is a complex one and it is possible that relations between self-esteem and behaviour may be reciprocal.

### Conclusions, limitations and recommendations for practice

In the present study, we incorporated constructs from achievement goal theory and self-determination theory in the physical education setting to explain the influences of general self-esteem. This is the first study to account for achievement goal theory and its effects on self-esteem and motivational factors from self-determination theory simultaneously. Our aim was to understand the mechanisms behind the effects and the development of self-esteem. Our findings support the utility of self-determination theory and goal achievement theory as guiding theoretical frameworks to facilitate the understanding of the processes underpinning the development of global self-esteem. Future studies should examine whether the influence of these motivational constructs is mediated by domain-level self-esteem in a physical context.

Although the findings of the present study have been robustly tested using a latent variable approach with valid measures, it has limitations that may restrict the generalizability of the findings. First, the study was conducted on a sample of school children aged 11–15 years. Further replication of this model using other age groups and target populations is warranted. Second, the data are correlational in nature, which, as with all correlational data, limits the inference of causality. There is therefore a need in subsequent research for prospective, longitudinal, and experimental tests of the hypothesized effects to better infer the causal nature of the proposed relationships.

In terms of practical recommendations arising from this study, physical education teachers aiming to foster high self-esteem among children in their lessons should provide an environment that supports the autonomy of pupils and fosters task and ego

goal orientations in tandem. The most appropriate strategy would be to focus on the adoption of a mastery-oriented motivational climate that supports both task orientation and autonomy and is not detrimental to ego orientation (Biddle, Wang, Chatzisarantis, & Spray, 2003; Butler, 1987).

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