

An Examination of Goal Orientation, Sense of Coherence, and Motivational Climate as Predictors of Perceived Physical Competence

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Abstract

The purpose of the present study was to investigate the extent to which children's goal orientation, sense of coherence (SOC), and perceptions of the motivational climate in PE accounted for their perceived physical competence. The variable measures were conducted with the participants (382 boys, 389 girls), aged 15-16, who completed a set of self-reported questionnaires. The hierarchical multiple-regression results showed that all steps lead to a significant change in the models and accounted for 20.2% of the variance in perceived physical competence. More specifically, the inclusion of task and ego orientation resulted in an additional 11.4% of explained variance and the inclusion of SOC lead to an additional 6.5% of explained variance. The SOC variable was also the strongest predictor of perceived physical competence ($X = .26$). The correlation found between the task and ego-involving motivational climate scales for girls was strong ($\beta > .04$) and negative. A strong positive correlation was found between task involving motivational climate and task orientation for the boys. All other correlations for the motivational variables were moderate or weak. T-tests revealed that boys scored significantly higher for all variables except ego-involving motivational climate and task orientation.

Key words: physical education, achievement goals, adolescents, competence, life expectations

Introduction

Increases in obesity rates and the alarming prevalence of type 2 diabetes among children and adolescents (Reilly, 2006), together with their decreasing levels of physical fitness and activity (Pate, Long & Heath, 2000; World Health Organization, 2008), challenge researchers worldwide to better understand the factors that influence physical activity and support the adolescents' participation in physical activities. Physical activity is always a result of cognitive processes (Noland & Feldman, 1984), in which social-cognitive factors, such as perceived competence play an important role (Kalaja, Jaakkola, Liukkonen, & Watt, 2010).

One psychological construct related to motivation and participation in physical education (PE) is the belief of one's competence in PE (Harter, 1985; Haywood, 1991). In the educational field, perceived competence was originally a general, one-dimensional construct reflecting the degree of an individual's self-esteem, self-confidence, or self-sufficiency (Harter, 1978). In the sport and physical activity domain, perceived competence has been described as a statement of personal ability that generalizes across a domain such as sport (Fox, 1997), and is therefore referred to as 'perceived sport competence' (e.g. Fox & Corbin, 1989; Lau, Fox, & Cheung, 2005). In this study of children participating in PE classes at school, we use the term 'perceived physical competence', referring to children's subjective perception of their physical competence. The aim of the present study was to investigate the extent to which children's goal orientation, sense of coherence, and perceptions of the motivational climate in PE accounted for their perceived physical competence.

Researchers have proposed several motivational theories (e.g., Harter, 1978; Deci & Ryan, 1985) and generated empirical evidence that shows how perceptions of physical competence are linked to the individual's motivation and engagement toward physical activity, and psycho-social well-being. Firstly, children with high perceptions of their physical competence have higher levels of participation in physical activity (e.g. Wang, Biddle, Chatzisarantis, Spray & Christopher, 2002), higher perceptions of intrinsic motivation (e.g., Cury et al., 1996; Standage, Duda, & Ntoumanis, 2003), remain engaged in physical activities longer, and perform better in activity than children with low perceived physical competence (Rudisill, 1989). Furthermore, high levels of perceived physical competence in adolescents have been found to be related to physical well-being attributes such as lower weight, lower body mass index, and higher aer-

obic fitness (Craft, Pfeiffer, & Pivarnik, 2003). This link was also supported through the results of the longitudinal school study of Barnett, Morgan, Beurden, and Beard (2008), that indicated that high perceived physical competence mediated the relationship between childhood motor skill proficiency and subsequent adolescent physical activity and fitness. Finally, children's perceived physical competence has been found to be associated with greater peer acceptance (Craft et al., 2003), experiences of more positive affective states (Ebbeck & Weiss, 1998; Quedest & Duda, 2009), high levels of enjoyment (Moustaka & Vlachopoulos, 2004), and less negative affect (Ommundsen & Pedersen, 1999).

Perceived physical competence seems to be central for children in their early adolescence when comparison with others becomes an important element of the self (Damon & Hart, 1982). This perspective is contained in the goal orientation approach (e.g., Dweck, 1986; Nicholls, 1989), according to which the achievement goals are conceptualized as the main purpose of the task engagement. The dominant goal of a person is the demonstration of competence or avoiding incompetence. Research has identified, and primarily utilized, two types of goals: task orientation which represents the construe of competence in terms of mastery or task improvement and ego orientation, in which competence is based on normative criteria such as winning against others. Nicholls (1989) stated that interaction between goal orientations and perceptions of competence varies. More specifically, high ego-oriented individuals are likely to feel success only when they have accompanying high perceptions of their ability, whereas, in case of high task orientation, individuals both high and low in perceived ability may feel success in an activity. These two goals have been suggested to have orthogonal relationship, which infers that some individuals can be high or low in both while others may be high in one goal but not the other (Nicholls, 1989). The interaction of this "goal profiling" and perception of competence still requires further research (Wang et al., 2002). Kavussanu and Harnisch (2000) proposed that the perceptions of competence may be easier to maintain for task-oriented individuals with self-referenced accomplishment compared to those with an ego orientation, whose perceptions of competence are dependent on others. Goal orientation has been found to be related to perceived competence in different physical activity contexts (Kavussanu & Roberts, 1996), that include physical education environments (Cury et al., 1997). According to some studies, however, there is no relationship

between an ego-orientation and perceived competence (e.g., Vlachopoulos & Biddle, 1997).

The individual's perception of competence and goal orientations are also dependent on how they perceive and interpret the structure of the achievement environment (Ames, 1992; Nicholls, 1989). According to Ames (1992), the perception of the environment can also be divided into task- and ego- involving motivational climate in parallel with their goal orientations. Individuals are likely to experience a task-involving motivational climate in an atmosphere of co-operation when effort, learning, mastery of a task, and participation are valued and stressed by the teacher. In contrast, when the grouping of the pupils is based on their ability and an inflexible learning time is imposed, and interpersonal competition, normative feedback, and public evaluation are emphasized, pupils are likely to perceive the climate as ego-involving. From a theoretical perspective, task-involving motivational climate is presupposed to promote pupil's perceptions of competence because the self-referenced criteria (e.g., effort) underlying competence judgments and the ensuing feeling of success are more controllable and readily achievable compared to normative-based criteria (e.g., winning). Furthermore, such an environment stresses the development of individual competence instead of protecting one's ability (Duda, 2001). Studies in physical activity settings have shown the relationship between the perceived motivational climates and perceived competence (Cury et al., 1996; Wallhead & Ntoumanis, 2004) or beliefs that ability leads to success in environment stressing ego-involving climate (Treasure, 1997).

Research into the factors contributing to physical competence in PE has received new impetus from a rather surprising direction. Within health-related studies concerned with the problems of stress and coping, the concept of sense of coherence (SOC; Antonovsky, 1979, 1987) refers to a global and dispositional orientation that contributes to an overall perception of coherence. SOC consists of three highly interrelated components, which are: comprehensibility, the cognitive control over one's environment, which is seen as structured, consistent, and understandable; manageability, the view that one has sufficient resources available to overcome obstacles in life; and most importantly, meaningfulness, which involves determining whether life makes sense emotionally, and which areas of life are worth dedicating both time and effort. Empirically, it seems that SOC is relatively stable in middle to late adolescence (Buddeberg-Fischer, Klaghofer, & Schnyder, 2001), and that the stability of

SOC between the ages of 15 to 18 does not depend on the individual's initial SOC (Honkinen et al., 2008). SOC has also been shown to be connected with good health and well-being in samples of Scandinavian adolescents (e.g., Honkinen, Suominen, Välimaa, Helenius, & Rautava, 2005; Nielsen & Hansson, 2007), with healthier health behaviours in college students (Posadzki, Stockl, Musonda, & Tsouroufli, 2010), and with the frequency of physical activity in adults (Kuuppelomäki & Utraiainen, 2003; Read, Aunola, Feldt, Leinonen, & Ruoppila, 2005).

Theoretically, the construct of SOC is considered to be based on experiences during childhood and adolescence, determined by general resistance resources, as described by Antonovsky (1987), that could be either individual (e.g., strong physic, genetic strengths, money, adaptive social skills) or socio-cultural (e.g., education, power, social support, culture). Bengtsson-Tops, Brunt, and Rask (2005) argued that social factors are of particular importance, because SOC is not only developed but also maintained in a social context. Previous findings have highlighted that both individual factors, such as attention problems, anxiety/depression, and somatic complaints (Honkinen, 2009), and socio-cultural factors, including social support, family conflict, and neighborhood cohesion (Marsh, 2007), serve as predictors of SOC in adolescence.

Very recently, SOC has been included in various school studies, because schooling may, in a very dualistic way, both establish resources and create stress with regard to performance (Kristensson & Öhlund, 2005). SOC has proved to be a protective factor in the school context due to its positive associations with adolescents' teacher-rated academic competence (Efrati-Virtzer & Margalit, 2009) and grades (Kristensson & Öhlund, 2005; Lackaye & Margalit, 2006). Sollerhed, Ejlertsson, and Apitzsch (2005) found that 16-19-year-olds positive attitudes to PE were related to strong SOC, which was additionally connected to higher PE grades. Also in the PE context, Bronikowski and Bronikowska (2009) reported that the SOC of the 13-year-old adolescent boys improved during a 15-month PE intervention based on developing individual responsibility.

A few exceptions aside (Verkooijen, Nielsen, & Kremers, 2008), the findings concerning the gender differences in the total SOC have consistently shown that adolescent boys score higher in SOC than girls (e.g., Honkinen et al., 2008; Myrin & Lagerström, 2006; Nielsen & Hansson, 2007; Nio, 2010). As for the subcomponents of the SOC, girls have

scored higher in meaningfulness, whereas boys have scored higher in manageability (Sollerhed et al., 2005).

Given the beneficial outcomes related to perceived physical competence and the fact that perceived physical competence declines with age (Digelidis & Papaioannou, 1999), it is important to understand how it is formulated and could be maintained. The aim of the present study was to investigate the extent to which children's goal orientation, SOC, and their perceptions of the motivational climate in PE accounted for their perceived physical competence. The framework of this study is based on interactionist theories, which stress the individual's experiences being dependent on the interactions of his or her dispositions and environment (Nicholls, 1989; Turner, 1987). According to Turner (1987) "individuals are seen as possessing configurations of self referencing attitudes, dispositions, feelings, definitions, and meanings about themselves as objects in situations; and they behave in ways to affirm the substantive content of these configurations" (p. 17). Despite the discord concerning the conceptualizations of the "situational", "conceptual" or the self-referencing processes (Turner, 1987), the self conception has assumed to be the more powerful motivational force than either environment or situation. The stronger the individual's predisposition, the stronger the environmental cues are needed to supersede it (Treasure & Roberts, 1995).

Based on the theoretical and empirical findings presented in the introduction, we expected both children's goal orientations and perceptions of the motivational climate to predict their perceived physical competence in PE. As for the SOC, which has been previously linked only to physical competence as measured by PE grade (Kristensson & Öhlund, 2005; Sollerhed et al., 2005), it was now expected to contribute positively to children's perceptions of physical competence. Additionally, gender differences were expected to follow the patterns demonstrated in earlier findings. Boys were assumed to score higher in ego-orientation (Anderson & Dixon, 2009; Jaakkola, 2002), ego-involving motivational climate (Kokkonen, 2003; Soini, 2006), physical competence (Hayes, Crocker, & Kowalski, 1999; McKiddie & Maynard, 1997), and in SOC (Antonovsky & Sagy, 1986; Honkinen et al., 2008; Nielsen & Hansson, 2007; Myrin & Lagerström, 2006; Nio, 2010). Girls were expected to be more task-oriented compared to boys (Anderson & Dixon, 2009; Jaakkola, 2002).

Method

Participants and Procedure

The original sample consisted of 786 pupils (391 boys, 395 girls), aged 15-16 years, who were recruited from volunteers from 40 classes within eight urban secondary schools in the central and southern parts of Finland. The participants were informed of the voluntary nature of participation, that their results would remain confidential, and of the right to withdraw without penalty if they were unwilling to finish the questionnaires. They were also encouraged to ask for help if they found the wording of the instructions or items confusing. The teachers who conducted the data collection process, which took place within school sports facilities at the beginning of the PE lesson, did not report any problems with students completing the questionnaires. Due to missing information in some of the study variables, all analyses reported in this paper were performed using the final sample of 771 pupils (382 boys, 389 girls).

The participants completed the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balaque, 1998), the Perceived Motivational Climate in Sport Questionnaire (PMCSQ-1; Seifriz, Duda, & Chi, 1992), the Orientation to Life Questionnaire (Antonovsky, 1987), and the modified Finnish version of the Sport Competence sub-scale of the Physical Self-Perception Profile (PSPP; Fox & Corbin, 1989). It took approximately 45 minutes to fill in the questionnaires. A cross-cultural validation was undertaken by having all questionnaires translated into Finnish by a panel of experts who speak both languages and then later back into English by a native English speaker who is also competent in the Finnish language. The back-translated English version was compared with the original version for consistency. The panel of experts discussed items with controversial meanings in the Finnish version in order to redraft them as accurately as possible to ensure the correct meaning of each item.

Measures and Variables

Goal orientation was analyzed by using the 12-item modified Finnish version of the children's Perception of Success Questionnaire (POSQ; Roberts, et al., 1998). Following the stem "I feel most successful in PE lessons when...", students responded to six task-oriented items (e.g., "I overcome difficulties") and six ego-oriented items (e.g., "I do better than others"). The items were rated on a five-point Likert scale (*1= does*

not correspond at all, to 5 = correspond exactly). Internal Consistency of the POSQ was demonstrated by Cronbach alpha coefficients of .87 for the task-orientation subscale, and .91 for the ego-orientation subscale, which are similar to the values reported in previous school PE studies for the same subscales of .89 and .93 (Jaakkola, 2002) and .85 and .87 (Liukkonen & Leskinen, 1998).

Perceived motivational climate in PE lessons was assessed using the modified 20-item Finnish version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ; Seifriz et al., 1992). The original 40-item version of the PMCSQ was used in a study of Finnish adolescent male soccer players (Liukkonen, 1998). Based on the results for the modified scale for youth soccer, 15 items were removed on the basis of confirmatory factor analysis and five items (e.g., “If you want to play in a game you must be one of the best players”) not included due to their inappropriateness to PE settings. The remaining items were modified with through minor adaptations to the PE context (i.e., the words “coach” and “training sessions” were replaced by “teacher” and “physical education lessons”). The stem “In my PE lessons” preceded each remaining item to which the pupils responded on a five-point semantic differential scale ranging from (1 = *strongly disagree* to 5 = *strongly agree*). The sum score of *task-involving motivational climate* consisted of 12 items (e.g., ‘In my PE lessons trying hard is rewarded’ and ‘In my PE lessons, players try to learn new skills’). The sum score of *ego-involving motivational climate* consisted of eight items (e.g., ‘In my PE lessons, only the top players “get noticed” and ‘In my PE lessons, doing better than others is important’). The Cronbach alpha coefficients were .84 for the task-involving subscale and .77 for the ego-involving subscale, which are equivalent to the subscale reliability values found in earlier school PE studies of .86 and .91 (González-Cutre, Sicilia, Moreno, & Fernández-Balboa, 2009) and .86 and .85 (Spittle & Byrne, 2009), respectively.

The 13-item Orientation to Life Questionnaire (Antonovsky, 1987) was used to measure *sense of coherence* on a 7-point semantic differential scale with two anchoring phrases (e.g., 1 = *very often* to 7 = *very seldom or never*). The temporal stability (Feldt, Leskinen, Kinnunen, & Ruoppila, 2003; Nilsson, Holmgren, Stegmayr, & Westman, 2003) and the validity of the SOC have previously been demonstrated (Eriksson & Lindström, 2005). A Cronbach alpha coefficient for the total scale of .87 was reported by Honkinen et al. (2005) for 1231 twelve-year-old Finnish children and a coefficient of .84 reported by Hagquist and Andrich (2004) for

868 eighteen-year-old Swedish adolescents. In the present study, the Cronbach alpha coefficient for the SOC scale was .83. Sum scores used in the analysis of the present study, based on standardized z-scores, reflected the original subscales of the questionnaire. *Comprehensibility* was represented by five items, such as ‘Has it happened in the past that you were surprised by the behaviour of people whom you thought you knew well?’ and ‘Do you have very mixed-up feelings and ideas?’ *Manageability* was analysed by four items, including ‘Do you have the feeling that you are being treated unfairly?’ and ‘How often do you have feelings that you are not sure you can keep under control?’ *Meaningfulness* was assessed by four items, including ‘Do you have the feeling that you do not really care about what goes on around you?’ and ‘How often do you have the feeling that there is little meaning in the things you do in your daily life?’ The Cronbach alpha coefficient for the comprehensibility scale was .70, for the manageability scale .61, and for the meaningfulness scale .59.

Perceived physical competence was measured by a sum score of six items from the modified Finnish version of the Sport Competence subscale of the Physical Self-Perception Profile (PSPP; Fox & Corbin, 1989). The scale used in this study had the individual item stem of ‘‘What am I like?’’. Responses to the items were provided on a five-point Osgood scale (e.g., ‘‘I am good at physical activities (1) to (5) poor at physical activities’’). The original response scale was recoded so that high score reflected high perceived physical competence. The Cronbach alpha coefficient for the total scale was .87, which was in line with the coefficient alpha of .74 reported by Jaakkola (2002) for Finnish ninth-graders. It also corresponded to the internal consistency reliability values of .81 and .92, based on a sample of 12-13-year-old British secondary school boys and girls, reported by Lau et al. (2005).

Data analysis

The data were summarised through descriptive statistics, and further analysed using Pearson product-moment correlation and hierarchical multiple-regression analyses. Additionally, we evaluated the gender differences using independent samples *t*-tests.

Results

Descriptive, T-test, and Correlation Analyses

The descriptive statistics and t-test results are presented in Table 1. Boys' perceived their PE lessons to be more task involving, demonstrated stronger SOC, and reported higher levels of ego orientation and perceived physical competence, whereas girls were more task oriented than boys.

Table 1 *Descriptive Statistics and T-test results*

Variable	Total (N = 771)		Boys (n = 382)		Girls (n = 389)		t (769)
	Mean	SD	Mean	SD	Mean	SD	
Task-involving climate	3.52	0.63	3.62	0.60	3.41	0.64	.4.68*
Ego-involving climate	2.74	0.76	2.77	0.70	2.70	0.82	1.31
SOC	4.15	0.87	4.35	0.88	3.96	0.81	6.44*
Ego orientation	3.17	1.04	3.34	0.99	3.01	1.07	4.47*
Task orientation	4.16	0.75	4.05	0.75	4.27	0.73	-4.06*
Perceived physical competence	-2.88	0.94	-2.73	0.96	-3.04	0.90	-4.60*

Note * $p < .05$

Pearson correlations between the variables for each gender are shown in Table 2. The correlation found between the task and ego-involving motivational climate subscales for girls was strong (Ary, Jacobs, Razavieh, & Sorrenson, 2006) and negative. The second strong correlation was positive and found between task-involving motivational climate and task orientation for the boys. All other correlations between the motivational variables were moderate or weak. The correlations for SOC and motivational climate were moderate for boys and weaker for the girls, whereas, the correlations for SOC and the orientation variables were all weak. The relationships between perceived physical competences were moderate for the boys for all variables except ego-involving motivational climate. In girls, perceived physical competence was moderately connected to only SOC and task orientation

Table 2 *Correlations between the Motivational Climate, Sense of Coherence, Task and Ego Orientation and Perceived Physical Competence*

Variable	1.	2.	3.	4.	5.	6.
1. Task-involving climate		-.44 ***	.18 **	-.11 *	.37 ***	.19 ***
2. Ego-involving climate	-.29 ***		-.20 ***	.33 ***	-.15 **	-.03
3. SOC	.32 ***	-.32 ***		.02	.15 **	.28 ***
4. Ego orientation	-.01	.25 ***	-.04		.19 ***	.18 **
5. Task orientation	.52 ***	-.17 **	.19 ***	.26 ***		.30 ***
6. Perceived physical competence	.23 ***	-.05	.26 ***	.23 ***	.25 ***	

Note Girls (n=389) are above and boys (n=382) below the diagonal.
 ***=p < .001, **=p < .01, *=p < .05

Hierarchical Multiple-Regression Analysis

A hierarchical multiple-regression analysis was conducted in order to examine how the motivation variables and SOC affected the likelihood of perceived physical competence for the participants. In the analysis, gender, task orientation, ego orientation, SOC, task-involving climate, and ego-involving climate were independent variables, whereas perceived physical competence was the dependent variable. Given that *t*-tests revealed significant gender differences in the independent variables, except for ego-involving motivational climate, gender was entered in the first step in the model as a statistical control in the analysis. In step two, we entered individual characteristics (Nicholls, 1989) such as the orientation variables in the model because it is a rather stable motivational construct having some stability over time (Duda & Whitehead, 1998) and it is earlier found to be related to perceived physical competence (e.g., Kavussanu & Roberts, 1996). In the third step we entered SOC as it is also considered to be a relatively stable construct by the age of 15 (Honkinen et al., 2008), but has received only limited attention as a variable in the PE domain. Finally, we entered the contextual variables of perception of motivational climate (Nicholls, 1989), to which PE teacher should directly be able to affect and thus, represent the least stable constructs.

The hierarchical multiple-regression results are shown in Table 3 and indicated that all steps lead to a significant change in the models and accounted for 20.2% of the variance in perceived physical competence. The Analysis of Variance (ANOVA) revealed that a significant final model emerged ($F_{6,764} = 33.58, p < .001$). All independent variables entered at each step of the model had a significant impact on the dependent variable except for ego-involving motivational climate ($t = 1.25, p = .210$). The inclusion of task and ego orientation resulted in an additional 11.4% of explained variance and the inclusion of SOC lead to an additional 6.5%

of explained variance. The SOC variable was also the strongest predictor of perceived physical competence ($\beta = .26$).

Table 3 *Hierarchical Multiple-Regression Analyses*

Model	Variable(s)	SEB	R	R ²	Adjusted R ²	F	Sig. F
1	Gender	-.09	.164	.024	.023	19.184	<.001
2	Task Orientation	.20	.371	.138	.135	50.540	<.001
	Ego Orientation	.15					
3	SOC	.26	.450	.202	.198	61.965	<.001
4	Task involving climate	.09	.457	.209	.202	3.006	.05
	Ego involving climate	.05					

Discussion

The aim of the present study was to investigate the extent to which children's goal orientation, SOC, and their perceptions of the motivational climate in PE accounted for their perceived physical competence. We were particularly interested in the impact of SOC as a predictor of children's perceived physical competence as only limited research has been undertaken to investigate the role that SOC may play as a psychological characteristic associated with children's engagement within the school PE teaching and learning environment.

The descriptive results showed that pupils' were more task than ego oriented and they also perceived more task- than ego- involving motivational climate during their PE lessons, which were in line with earlier findings in Finnish PE context (Jaakkola, 2002; Kokkonen, 2003; Soini, 2006). Overall, this is a good basis for pupils' to formulate a personal theory of achievement, as both of these variables affect pupils' adoption of task involvement in the given achievement situation, which in turn, is more likely decrease their maladaptive motivational responses (Nicholls, 1989). Another positive finding was that, pupils' scored relatively high in SOC, which in turn, has been shown to be predisposed

individual's good health and well-being in health-related studies (Honkinen et al., 2005; Nielsen, & Hansson, 2007).

In accordance with previous gender-based findings relating to student perceptions of PE (Hayes et al., 1999; McKiddie & Maynard, 1997), the results of the current comparisons showed that boys perceived themselves higher in physical competence than girls. The level of difference between the genders might have been reduced however, if we had been able to standardize the amount of physical activity undertaken by both sexes, as in the procedures adopted by Lintunen (1999). This study supported the earlier findings (e.g. Antonovsky & Sagy, 1986; Honkinen et al., 2008; Nielsen & Hansson, 2007; Myrin & Lagerström, 2006), in which boys tended to score higher in SOC in general. In addition, we confirmed Anderson and Dixon's (2009) finding that boys tend to score higher on ego orientation and girls score higher than boys on task orientation. However, an unexpected finding was that boys scored higher in task-involving motivational climate than girls. It should be noted that boys and girls are not taught by the same PE teacher in Finland and thus they do not share the same motivational climate. This means that the comparison between boys and girls does not necessarily reflect the actual gender differences in the perception of motivational climates.

Correlational findings showing moderate negative interrelationships between task and ego involving motivational climates for both genders support the proposition that those dimensions are neither purely orthogonal nor bipolar (Duda, 2001). In addition, the relationship of the SOC and goal orientation to other variables may be reflected by the fact that these variables are considered to be dispositional orientations and therefore contributing to other variables with the same strength. In line with earlier studies, perceived physical competence was also related, with the same strength (e.g., Standage et al., 2003), to perception of task-involving motivational climate (Dunn, 2000; Jaakkola, 2002; Kavussanu & Roberts, 1996) and goal orientation (Cury et al., 1997). We extended the findings of Kristensson and Öhlund (2005) and Sollerhed et al., (2005) regarding a positive relationship between pupils' SOC and physical competence as indicated by PE grade, by showing that children's SOC was also moderately related to their subjectively-perceived physical competence in general. An unexpected finding was the non significant relationship between perceived physical competence and ego-involving motivational climate.

The regression analysis showed that 20 percent of the variance in perceived physical competence was explained by children's goal orientation, perception of task-involving motivational climate and their SOC. Goal orientation including task- and ego- orientation, explained the largest portion of the variance of perceived physical competence, however, SOC was the strongest predictor of perceived physical competence. It could be that the motivation theories in the area of PE such as achievement goal theory (Nicholls, 1989) would benefit from taking into consideration SOC as a representation of a more medically orientated sociological perspective (Antonovsky, 1987). Individuals with strong SOC perceive life around them as comprehensible, manageable, and meaningful, which improves their possibilities to successfully handle forthcoming challenges. **In light of the current trends of increasing obesity and related illness, and decreasing physical fitness within the adolescent population, the significance of SOC in promoting physical competence and healthy lifestyle choices should be kept in mind (Posadzki et. al., 2010).**

In the spirit of interactionist theories, our findings challenge teacher education and PE teachers to consider their teaching practices and pedagogical assumptions in two ways. Firstly, although Antonovsky (1987) considered SOC as a rather stable disposition partially determined by general resistance resources (e.g., economic background, learning behaviour, and intelligence), for which a teacher's possibilities to affect are restricted, socio-cultural resistance resources such as social support have also been found to predict SOC (Marsh, 2007). Additionally, SOC has been assumed to be maintained in a social context (Bengtsson-Tops et al., 2005), and shown to improve during a 15-month PE intervention (Bronikowski & Bronikowska, 2009). Extended knowledge regarding pedagogical developments in teaching strategies could assist PE teachers to establish a sense of meaningfulness, comprehensibility, and manageability in their pupils and promote participation, effort, learning, and task-mastery as fundamental elements of their classes. Information associated with personal values and the supporting practical skills could be covered in teacher education courses, and the impact of this type of program change on influencing pupils' SOC and perceptions of motivational climates in PE investigated within a longitudinal study design.

The dispositions of SOC and goal orientation were dominant in comparison to the pupils' perceptions of motivational climate. Therefore, there seems little chance for dispositions that are rather

stable to be overridden by motivational climate, which may limit the teacher's influence on educational outcomes. In addition, emphasizing a certain social-psychological environment such as motivational climate in PE is not only dependent on the PE teacher but also significant others including parents and peers (Weigand, Carr, Petherick & Taylor, 2001). One pedagogical solution to address this challenge might be a guarantee for teachers to teach same PE group over a relatively long time period. Treasure and Roberts (1995) suggest that the longer an individual perceives the motivational climate to be more or less ego or task involving, the more likely they behave in line with the structure of the situation. Thus, pupils' dispositions such as SOC together with their environmental/situational experiences, such as perceived motivational climate, need to be taken into consideration when the improvement of pupils' perceptions of their physical competence is the pedagogical focus.

There are several limitations to the study design that deserve comment. Firstly, the selection of the participants, which was based on recruiting volunteers rather than random selection, limits the generalization of the results to a larger population. Secondly, all variables were assessed by means of self-reports, which makes it possible that the link between them was affected by shared method variance. Measuring self-perceptions, such as perceived motivational climate and perceived physical competence, however might be best achieved by asking the participants directly, as they will have the greatest familiarity with their own internal states. Thirdly, the self-reports were administered simultaneously and on a single occasion, negatively impacting on the criterion of the time precedence necessary for making causal inferences (Breckler, 1990). Thus, our cross-sectional study design does not allow for any direct, firm conclusions regarding causality.

Finally, goal orientation, SOC, and perceived motivational climate in PE explained 20 percent of the variance in perceived physical competence. This implies that there are other variables that could be included in a more comprehensive model to account for a larger proportion of variance in perceived physical competence (the omitted-variable problem; Fergusson, 1997). For example, contributing factors of perceived physical competence such as peer acceptance (Craft et al., 2003), peer and family's influences, children's sport identity (Lau et al., 2005), being overweight (Phillips & Hill, 1998), and maturational status (O'Dea & Abraham, 1999) were not included in this study. Nevertheless, considering the complexity of perceived physical competence and its

psychological contributors, our findings revealed plausible factors that contribute towards the determination of perceived physical competence.

Despite these flaws, there are several important aspects of the current research that should be highlighted. The outcomes of this study not only enhanced our knowledge of the SOC within the adolescent population, but also increased our understanding of the role of SOC in children's perceived physical competence. To the best of our knowledge, this was the first study to relate SOC in adolescence to perceived physical competence, and one of the few studies that have applied SOC to the sport and exercise area. The current findings, therefore, contribute useful information to the current literature by highlighting that SOC, which has mainly been used in health, coping, and occupational research areas, is also a valid concept in the PE and sport domains. Furthermore, knowledge of SOC and its relation to other dispositions and environmental contributors may have important practical implications for teacher education in PE. Educational systems need to pay more attention to those factors that could help PE teachers to create an effective social-psychological environment through which pupils' attributes related to physical activity engagement, such as perceived physical competence, could be supported. By doing this, teachers may be successful in enhancing other valuable PE outcomes, such as physical performance (Burkhalter & Wendt, 2001), self-esteem (Ebbeck & Weiss, 1998), and positive affect (Ebbeck & Weiss, 1998; Liukkonen, 1998).

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