JUHA KOKKONEN

CHANGES IN STUDENTS' PERCEPTIONS OF TASK-INVOLVING MOTIVATIONAL CLIMATE, TEACHER'S LEADERSHIP STYLE, AND HELPING BEHAVIOUR AS A RESULT OF MODIFICATIONS IN SCHOOL PHYSICAL EDUCATION TEACHING PRACTICES

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ABSTRACT

Juha Kokkonen. Changes in students' perceptions of task-involving motivational climate, teacher's leadership style, and helping behaviour as a result of modifications in school physical education teaching practices. Jyväskylä: LIKES-Research Center for Sport and Health Sciences 2003, 148 p. (LIKES-Research Reports on Sport and Health, ISSN 0357-2498; 138)
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The primary aim of this quasi-experimental, longitudinal intervention over a time span of one academic year directed toward increasing task-involvement during physical education lessons was to analyse changes in students' perceptions of task-involving motivational climate, teacher's leadership style, and self-reported helping behaviour. The intervention consisted of weekly consultation meetings with the teachers in experimental schools. The participants of the experimental groups consisted of 178 ninth-grade pupils, taught by four teachers whereas control groups consisted of 155 pupils, taught by three teachers. Participants responded to a multi-sectional questionnaire incorporating Finnish versions of the Perceived Motivational Climate in Sport Questionnaire-2, willingness to help and unselfishness sub-scales of the Helping Behaviour Scale, and social support and democratic behaviour sub-scales of the Leadership Scale for Sports. Multivariate analyses of variance revealed that intervention decreased experimental pupils' perception of task-involving motivational climate in their physical education lessons. Contrary to expectation, one part of the task-involving climate named perception of effort/improvement even decreased among experimental pupils. These results were parallel with the pupils of control schools. However, not due to increased task-involving climate but pedagogical solutions during the intervention, experimental pupils' tendency to help each other increased compared to control pupils. Furthermore, no differences were found on teacher's leadership style perceived by both experimental and control pupils during the intervention. Overall, the influence of the intervention was similar to both genders, showing that both boys' and girls' perceptions on the intervention were parallel. In order to deepen the experimental-control design, the data was also analysed at teacher and physical education group levels. Confirming the previous findings, no differences on pupils' perception of measured variables were found at the teacher level. Furthermore, at the physical education group level the only difference existed in experimental pupils'

perception of ego-involving climate. This finding implies that some students' perceptions of ego-involving motivational climate decreased whereas the others' increased even if they were taught by the same teacher. All in all, the results showed that the programme designed for increasing task-involving motivational climate in terms of pedagogical means and practices in physical education lessons needs further developing. In addition, longer interventions covering pupils' environment widely is required in order to change pupils' motivational cognitions and motivational behaviours.

Key words: Motivational climate, teacher's leadership style, helping behaviour, physical education, intervention

TIIVISTELMÄ

Juha Kokkonen. Oppilaiden kokemukset tehtäväsuuntautuneen motivaatioilmaston, opettajan johtamiskäyttäytymisen sekä oppilaiden auttamiskäyttäytymisen muutoksista liikunnanopettajien täydennyskoulutuksen seurauksena. (Changes in students' perceptions of task-involving motivational climate, teacher's leadership style, and helping behaviour as a result of modifications in school physical education teaching practices) Jyväskylä: LIKES-Research Center for Sport and Health Sciences 2003, 148 s. (LIKES-Research Reports on Sport and Health, ISSN 0357-2498; 138)
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Tutkimuksen päätarkoituksena oli analysoida oppilaiden kokemuksia liikuntatuntien tehtäväsuuntautuneesta motivaatioilmastosta, opettajan johtamiskäyttäytymisestä sekä oppilaiden auttamiskäyttäytymisestä toisiaan kohtaan yhden lukuvuoden mittaisen motivaatioilmastointervention seurauksena. Lisäksi tutkimuksen tarkoituksena oli kehittää ja kuvailla ohjelma, jonka avulla tuntien tehtäväsuuntautuneisuutta saataisiin parannettua. Tutkittavat olivat pakolliseen koululiikuntaan osallistuvia yhdeksäsluokkalaisia 15-vuotiaita oppilaita. Tutkimusryhmään kuului 178 oppilasta ja neljä heidän opettajaansa. Vertailuryhmänä oli 155 oppilasta ja kolme heidän opettajaansa. Tutkimus oli luonteeltaan kvasikokeellinen interventiotutkimus. Tutkimuksen mittareina käytettiin motivaatioilmastomittaria (Perceived Motivational Climate in Sport Questionnaire-2), sosiaalisen tuen ja demokraattisen käyttäytymisen alaskaaloja valmentajan johtamistapamittarista (Leadership for Sports) sekä halukkuus auttaa- ja epäitsekkyys-alaskaaloja auttamiskäyttäytymismittarista (Helping Dispositions Scales). Konfirmatorisen ja exploratiivisten faktorianalyysien perusteella mittareita pitää jatkossa kehittää koululiikuntaan paremmin sopiviksi. Monimuuttujavarianssianalyysit osoittivat, että intervention aikana tutkimuskoulujen oppilaiden kokemukset tehtäväsuuntautuneesta motivaatioilmastosta eivät eronneet vertailukoulujen oppilaiden kokemuksista. Vastoin odotuksia tutkimuskoulujen sekä vertailukoulujen oppilaat kokivat yhdellä alaskaalalla (yrittäminen/kehittyminen) mitattuna tehtäväsuuntautuneen motivaatioilmaston hieman laskeneen. Tutkimuskoulujen oppilaat kokivat oman auttamiskäyttäytymisensä lisääntyneen liikuntatunneilla verrattuna vertailukoulujen oppilaisiin. Tutkimuskoulujen oppilaat eivät havainneet muutosta opettajan johtamiskäyttäytymisessä intervention aikana. Sukupuolten

välisiä eroja ei ilmennyt mitatuissa muuttujissa. Tulosten analysointi suoritettiin lisäksi erikseen kunkin opettajan kohdalla sekä yksittäisen liikuntaryhmän tasolla. Saadut tulokset tukivat aiempia koe-kontrolli asetelmalla saatuja tuloksia. Poikkeuksena olivat erot kilpailusuuntautuneessa motivaatioilmastossa yksittäisten liikuntaryhmien tasolla, mikä osoitti eri ryhmissä toimivien oppilaiden erilaiset kokemukset kilpailusuuntautuneesta motivaatioilmastosta mahdolliseksi, vaikka motivaatioilmaston luomisesta eri ryhmille vastasi sama opettaja. Tutkimuksen perusteella tehtäväsuuntautuneeseen motivaatioilmastoon tähtäävää opettajien täydennyskoulutusohjelmaa on mahdollista toteuttaa yhdeksäsluokkalaisten oppilaiden liikuntatunneilla. Pedagogisten menetelmien toteuttaminen opettajan täydennyskoulutuksen välityksellä vaatisi jatkossa pitempikestoisia interventioita. Myös oppilaiden taustatekijät ja niiden vaikutukset motivaatioilmaston kokemiseen vaativat jatkossa laajempaa huomiota.

Avainsanat: Motivaatioilmasto, opettajan johtamistyyli, auttamiskäyttäytyminen, liikuntakasvatus, interventio

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Jyväskylä, January 2003

Juha Kokkonen

CONTENTS

1 INTRODUCTION

Motivation in work, sport, or education is a widely studied topic and has stimulated theoretical and empirical interest. During the past 20 years, sport psychology including also physical activities such as school physical education or exercise has increased our understanding of achievement motivation by showing the effects of psychological factors on individuals' physical performance capacity and participation in physical activity as effects on psychological characteristics. Lately, motivational patterns in different kind of achievement settings as in sport, exercise, and school physical education lessons have been studied on the basis of social cognitive framework (Roberts, 1992, 2001) or on social constructivism approach (Stephens & Bredemeier, 1996). These frameworks reflect how individuals cognitively process and develop their views about achievement behaviour in various social contexts (Roberts 1992; Stephens & Bredemeier, 1996).

Despite the fact that physical education in school is one of the most popular subjects among pupils (Silvennoinen, 1981), it is an obligatory achievement-oriented context including competition and normative evaluation. This factor may affect negatively some students' motivation towards physical activity through lessening perceived competence in school physical education lessons. Furthermore, based on the fact that students' total physical activity decreases by age, especially, when they reach the puberty age (Telama, Laakso & Yang, 1994; Telama & Yang, 2000), further efforts need to be made in order to strengthen their enthusiasm towards physical activity. In addition, physical activity among Finnish boys is polarising by age (Nupponen & Telama, 1998; Telama & Yang, 2000) to those who are very active and to those who rarely participate in sport activities, showing that passive children should be the primary concern when sport programmes trying to get people active are under developing.

Furthermore, considering the small number of physical education lessons a week (2) in comprehensive school, physical education teachers have a relatively demanding task in teaching pupils how to obtain, improve, and maintain their physical, psychological and social well-being, how to arouse their constant

life-span physical activity as well as how to make them understand the relationship between their physical activity and their own health (Peruskoulun opetussuunnitelma, 1994). Still, a physical education teacher should ensure equal and optimal learning environment for the students with high perceived competence as well as for the students with low perceived competence.

When explaining individuals' perceived ability in achievement behaviour, one of the dominant perspectives has been the goal orientation approach directed by the global psychological environment named motivational climate (Ames, 1992; Roberts, 1992), which consists of two separate perspectives named task-involving and ego-involving climate (Ames, 1992). Up till today, intervention studies in sport and physical education contexts have supported theoretical predictions concerning positive influence of task-involving climate and negative influence of ego-involving climate on participants' cognitive (e.g., perceived competence), affective (e.g., enjoyment), and behavioural (e.g., increased effort) outcomes (Ntoumanis & Biddle, 1999). Furthermore, studies show that motivational climate may be altered either towards task-involvement or ego-involvement (Digelidis, 2000; Treasure, 1993).

Rarely, however, intervention studies have taken such a long time (one academic year), included such intensive further education of physical education teachers, concentrated on such a variety of sport domains, and the most important thing, tried to see pupils as intentional and goal-directed persons who operate in a rational manner and are able to participate actively in decision-making, planning process and implementing their own achievement behaviour as in this study.

In addition, this study clarifies the relationships between motivational climate, pupils' helping behaviour, and teacher's leadership styles. Moreover, psychometric properties of the Finnish Motivational Climate Scale will be analysed for further researches, because the scale has mainly been used in English, French and Greek- speaking countries.

The aim of this quasi-experimental intervention, which uses pedagogical practices based on the TARGET-model (Epstein, 1989) structures is to increase the amount of task-involving climate in Finnish ninth-grade pupils' (15-year-old) physical education lessons. Secondary purposes are to examine if the students' possibly increased perceptions of task-involving climate in physical education

lessons increase their helping behaviour towards each other and their perceptions of social support and democratic behaviour given by their teacher.

This study represents one part of a larger exercise motivation project started by Docent Jarmo Liukkonen and Professor Risto Telama under the Department of Physical Education at the University of Jyväskylä and LIKES-Research Center in Jyväskylä, Finland. Timo Jaakkola and Juha Kokkonen joined the project in the beginning of 1998 by sharing the same data which are the bases for their PhDs. Jaakkola (2002) examined the students' intrinsic, extrinsic and amotivation as well as their perceived competence and goal orientation, whereas this study concentrates only on the variables of motivational climate, helping behaviour and teachers' leadership style.

2 MOTIVATION IN HUMAN BEHAVIOUR

The definition of the concept of motivation is mainly depended on motivation theory, which is chosen. During the past 100 years, there are more than 30 theories of motivation of which many have definitions of their own (Roberts, 1992). Nowadays, a widely accepted motivation theory completely clarifying or describing human behaviour does not exist. Actually, motivation of human behaviour is explained by using motivational models functioning in different situations or environments. Vartiainen and Nurmela (2002) present different motivation models or theories, which can be categorized in several ways such as according to the content or process of human behaviour or on the basis of endogenous cognitive factors, which are under person's control as well as factors controlled by others. One way to see the development of human motivation is a continuum from mechanistic theories which see a human being passive and impelled by psychological drives to cognitive theories which stress people's active role in decision-making and possibilities to initiate action through subjective interpretation of achievement context (Roberts, 1992, 2001).

All these different perspectives in the area of motivation on human behaviour try to answer to question why. Nowadays, "the research literature on motivation in physical activity sees human motivation as a dynamic and complex system consisting of dispositions, social variables, and cognitions that come into the play when a person undertakes a task at which he is evaluated, enters a competition with others, or attempts to attain some standard of excellence" (Roberts, 2001).

In this study, understanding motivation of human behaviour is based on the achievement goal theory (Ames, 1984, 1992; Dweck & Leggett, 1988; Maehr & Nicholls, 1980; Nicholls, 1984, 1989), which assumes that the "individual is an intentional, goal-directed organism that operates in a rational manner and that achievement goals govern achievement beliefs and guide subsequent decision-making and behaviour in achievement contexts" (Roberts, 2001).

This study is based on this theory for two reasons. Firstly, an assumption could be made that school physical education environment represents a constant achievement for the children in the form of striving to high grade. School environment directs the children to achieve maximum goals (grades), which predispose them to competition with others, to evaluation, and attaining some

standards of excellence. Secondly, the achievement goal theory has evolved from classroom work (Ames, 1984, 1992; Dweck & Leggett, 1988; Maehr & Nicholls, 1980). Although school physical education lessons rarely take place in the classroom, school context always involves children's evaluation and normative comparison as hidden curriculum.

Empirical testing of the goal-orientation theory in different countries with various methods as well as different contexts such as classroom (Ames, 1984, 1992; Dweck & Leggett, 1988), school physical education (Jaakkola, 2001; Papaioannou, 1994; Treasure, 1993) and youth sport (Liukkonen, 1998; Treasure, 2001) supports the selection of the goal-orientation theory for this study.

2.1 Achievement Motivation

Achievement behaviour consists of people's approach and/or avoidance dispositions, expectances, incentive values of success or failure, and/or cognitive assessments of success and failure in different physical activity settings (Roberts, 2001). In physical activity settings, achievement behaviours are those behaviours witnessed when the participants try harder, concentrate more, persist longer, choose to practice longer, join physical activities, and simply perform better (Roberts, 1992). These behaviour forms show individual to be motivated to achieve something in that particular achievement setting. Thus, achievement behaviour can be seen as one of the several targets, which all the motivation theories try to explain. In addition, not only the achievement behaviour but also the drop-out phenomenon (Piffaretti et al., 2001; Weiss & Petlichkoff, 1989) or participation motivation (Baxevani et al., 2001; Ryan et al., 1997) is stressed in motivation studies.

Indeed, the past 20 years social-cognitive theories such as perceived competence (Harter, 1981), self-efficacy (Bandura, 1977), self-determination (Deci & Ryan, 1985) and various achievement goal perspectives (Dweck, 1986; Nicholls, 1989) have demanded a true motivation theory to be based on three aspects: energising, direction, and regulation of the activity in different achievement settings. More recently, the characteristics of motivation has been studied on the basis of hierarchical model (Vallerand, 2001), which means that motivation exists within the individual at three hierarchical levels: situational (state), contextual (life

domain), and global (personality). Furthermore, motivation at the given level affects at the next lower level and *vice versa*.

2.1.1 Achievement goal theory

Nowadays, the social-cognitive theories' most important perspective when examining motivation is the achievement goal theory, which is based on classroom work (Ames, 1984, 1992; Dweck & Leggett, 1988; Maehr & Nicholls, 1980; Nicholls 1984, 1989). As noted before, this approach sees a person as an intentional and goal-directed, operating in a rational manner. The achievement goals are seen to govern achievement beliefs and guide subsequent decision-making and behaviour in achievement contexts (Nicholls, 1984). For specific physical activity settings people invest a certain number of their personal resources as, for example, effort or time, which are dependent on their achievement goals (Roberts, 2001). Despite the number of possible goals, in goal-orientation theory the dominant goal of a person is the demonstration of competence or avoiding incompetence (Nicholls, 1984). The achievement goal theory argues that perceived competence has an important role as a mediator of achievement behaviour (Nicholls, 1989).

Individual's self-concept is multifaceted and hierarchically organised. Our general self-perception goes through non-academic and physical perceptions ending up to the self-concepts of physical ability (Shavelson & Bolus, 1982; Watkins, Fleming & Alfon, 1989). Perceived competence is a statement of personal ability that can be generalized across the domain such as sport or work whereas perceived ability is connected to a limited set of behaviour (Fox, 1997). Despite these differences in the definitions of competence and ability, they are seen parallel in this study. According to Nicholls (1984) and Ames (1984), a person's perceived ability, not the actual or visible one, includes two conceptions in specific achievement situations named undifferentiated and differentiated conceptions of ability. The undifferentiated concept of ability may use when the person over 12 years of age is able or choose to separate the constructs of luck, task difficulty, and effort from ability whereas children under 12 are not able to or are only partly able to differentiate these concepts showing differentiated concept of ability (Nicholls, 1989).

However, how much they use differentiated or undifferentiated concepts of ability varies from child to child. In addition, despite the critical age level of 12, children above this age do not automatically separate these things. The differentiating process is affected by the child's beliefs and previous perceptions about the situation, which are connected to the child's understanding of ability and interpretations of their performance (Nicholls, 1989).

An individual in a state of task-involvement uses undifferentiated conception of ability. This person assumes that the more effort he or she puts on the activity, the more he or she learns and the more ability will be achieved (Nicholls, 1989; Roberts, 2001; Duda, 2001). An individual in the state of ego-involvement uses differentiated conception of ability and feels competent only when outperforming others or when showing a superior ability (Nicholls, 1989). In addition, an individual in the state of ego-involvement perceives competence when succeeding better than others with less work than others (Duda, 2001). An ego-involvement individual with a high perceived competence is connected to adaptive motivational responses whereas an individual with low perceived competence is associated with maladaptive responses (Duda, 2001).

Altogether, the adopted personal theory of achievement assumes that the interaction of general goal-orientation (dispositional) and environmental factors (perceived motivational climate) determines whether the individual adopts task or ego-involvement in specific achievement situations (Nicholls, 1989).

2.1.2 Task and ego-orientation

According to Roberts (2001), goal-orientations are not viewed as traits but as a cognitive schema. From a wider perspective, an assumption could be made that some other cognitive schemas affect the adoption of goal-orientation. For example, according to Antonovski (1987), a person with a strong self and a firm identity will have strong dispositional orientation named a sense of coherence, which is related to his or her task performance and behavioural outcome.

Thus, there may be several dispositional orientations formulating a hierarchical structure, which helps us to see or evaluate our environment and psychological well-being. However, a task-oriented individual in achievement contexts utilises undifferentiated concept of ability. A person's goals of action are development

mastery, improvement, or learning (Nicholls, 1989). The demonstration of ability is based on maximum effort and is self-referenced. However, an ego-oriented individual is using a differentiated concept of ability with goals of action demonstrating an ability relative to others or outperforming others, thus, success is evaluated through norm-referenced means (Ames, 1984; Nicholls, 1984). The task and ego-variables were named mastery and ability by Ames & Archer (1988), and learning and performance by Dweck (1986), respectively.

Task-orientation has been found to be positively associated with several adaptive cognitive outcomes, such as perceived competence (Sarrazin, Cury, Roberts, Biddle & Famose, 1999; Yoo, 1997), intrinsic motivation (Biddle & Soos, 1997; Dorobantu & Biddle, 1997; Lintunen, Valkonen, Leskinen & Biddle, 1999), reported employment of more positive strategies (Lochbaum & Roberts, 1993), perceptions of success (Vlachopoulos & Biddle, 1997), belief that hard work and co-operation lead to success in sport (Duda & White, 1992), belief that the purpose of sport is to enhance self-esteem, advance good citizenship, foster mastery (Duda, 1989), intention to be physically active (Lintunen et al., 1999), and self-reported physical activity (Demsey, Kimiecik & Horn, 1993; Telama, Naul, Nupponen, Rychtecky & Vuolle, 2002).

In addition, task-orientation is positively associated with affective outcomes: enjoyment (Goudas, Biddle & Fox, 1994; Liukkonen, 1998; Vlachopoulos & Biddle, 1997), reduced cognitive anxiety (Ommundsen & Pedersen, 1999), and flow phenomenon, the intrinsically enjoyable experience (Jackson & Roberts, 1992).

Furthermore, task-orientation is found to be positively related to behavioural outcomes; choosing challenging tasks (Kavussanu & Roberts, 1996), caring, responsibility, and introjected reasons for being disciplined while participating in physical education classes (Papaioannou, 1998), reported exerted effort (Sarrazin et al., 1999), continued participation in sport (Duda, 1988), and the use of spontaneous, deep-processing strategies during task-engagement (Thill & Brunel, 1995).

These positive cognitive, affective, and behavioural outcomes will be adopted also by ego-oriented individuals with high perceived competence whereas problems occur for ego-oriented individuals with low perceived competence

(Roberts, 2001). In these studies ego-orientation was inversely related or unrelated to the same responses.

Furthermore, ego-orientation has been found to be associated with several maladaptive cognitive outcomes such as a notion that ability and trying to beat others are antecedents of success (Lochbaum & Roberts, 1993; Roberts & Ommundsen, 1996) and an assumption that sport should enhance his or her popularity and build competitive spirit (Duda, 1989). Ego-orientated persons have a tendency to avoid practice or focus on winning during competition (Lochbaum & Roberts, 1993; Roberts & Ommundsen, 1996). Rascle, Coulomp, and Pfister (1998) also found in a group of handball players that ego-orientation was connected to the use of aggression. According to Lintunen et al. (1999), ego-oriented persons see sport ability as a gift or as a general trait of a person.

Theoretical assumption of the goal-orientation model assumes that these two goal orientations can be seen as independent, orthogonal, which means that an individual can be high or low in either one or both orientations at the same time (Nicholls, 1989). Thus, whether to adopt task or ego-orientation is not simply a black or white question. An individual is able to adopt a certain goal profile (high task/high ego, high task/low ego, low task/high ego, or low task/low ego), which has different effects on his or her, for example, behavioural outcomes. The orthogonality of goal-orientations has been investigated by Ames and Archer (1988) in classroom context, by Walling and Duda (1995) in physical education context, and by Liukkonen (1998) and Roberts, Treasure and Kavussanu (1996) in sport context.

It seems that a high task-orientation disposition is essential for an individual's adaptive motivational responses, no matter how high or low the persons in their ego-orientation are (Lemyre, Roberts & Ommundsen, 2001; Lintunen, Tynjälä, Välimaa et al., 2000). It is noteworthy that goal-orientations as a contextual form of achievement motivation have some stability over time (Duda & Whitehead, 1998) whereas goal-involvement varies more in different situations.

3 MOTIVATIONAL CLIMATE

In the beginning of the 20th entury, pedagogues Dewey and Kilpatrick noticed the importance of activity, self-reflection, and earlier experiences, which are the basis of constructivism or student/centric learning, to learning process (Uusikylä & Atjonen, 1999). Effective teaching/learning process in school is not based only on the verbal interaction between the pupil and the teacher but also on structural or material factors such as learning environment, learning atmosphere, and learning climate, which are mainly planned and created by the teacher.

Heinilä (2002) has clarified and described the history and roots of the concept of class climate. The term of social emotional climate was originally recognised by Anderson and Lewin, Lippitt, and White in the late 30's when they started to study the effects of teacher's behaviour on pupil's behaviour (Heinilä, 2002). Heinilä mentioned the meaning of observation in the 1960's while the focus turned from teaching efficacy research toward the investigation of classroom atmosphere and regularities of the teaching-learning process. At that time, Mosston developed "The spectrum of teaching styles", which assumes that teaching is based on a different chain of decision-making. The goal was to clarify a unified theory of teaching phenomenon (Mosston & Ashworth, 1994).

More recently, the teaching-learning process has been considered a larger and more dynamic, humanistic and optimistic perspective compared to the previous ones. The teacher's role is to plan and organise the learning "climate" or "environment" which is affected by several factors and of which each pupil will perceive actively and individually (Uusikylä & Atjonen, 1999). According to Bronfenbrenner (1980), child's micro, meso, exo, and macro-social systems affect his or her developing and learning. Thus, in the learning process not only the teacher's influence on students' perception of motivational climate but also the significant others such as coaches or parents are often taken into account (White, 1996; White, Kavussanu & Guest, 1998).

In addition, nowadays the motivation is considered to be a hierarchical structure (Vallerand, 2001). Motivation exists within the individual at three hierarchical levels: situational (state), contextual (life domain), and global (personality) level.

The motivation at the given level acts at the next lower level and *vice versa*, which should be considered when creating motivational climate.

Up till today, this "new" perspective of motivational climate has enlarged and specified our understanding of the teaching-learning process. In addition, due to an increased number of motivational researches the operationalising of motivational climate is more developed than at the beginning of the motivational climate research tradition. Still, the relationship between objective motivational climate captured by observation methods in physical education lessons and the subjective/perceived motivational climate including students' perceptions about the objective climate needs further clarification. In this study, the teachers created an open learning environment named task-oriented motivational climate (Nicholls, 1984) by utilising the TARGET-structures (Epstein, 1989). Due to lack of observation, the changes in teacher's pedagogical practices were controlled by evaluating teacher's leadership styles perceived by the pupils. This chain was supposed to increase pupil's helping behaviour towards each other.

This study utilises Nicholls's (1984) definition of motivational climate, which considers motivational climate as a global psychological environment directing the goals of action and consisting of two separate perspectives: task-involving and ego-involving climate.

3.1 Task and Ego-Involving Climate

Task-involving climate is salient when the children are guided towards intra-individual reference, when an individual perceives that effort, learning, mastery of a task, and participation are valued and pressured. Thus, task-involving climate is created when self-reference and task-involvement as criteria of success and failure are emphasised (Ames, 1984).

On the contrary, ego-involving climate appears when the grouping of the students is based on their ability and when inflexible learning time, interpersonal competition, normative feedback, public evaluation, and social comparison are emphasised (Ames, 1984). Thus, ego-involving climate is created when other reference and ego-involvement as criteria of success and failure are on focus (Ames, 1984).

There are two major definitions of motivational climate. Firstly, Ames and Archer (1988) defined task and ego-involving educational climate in the context of classroom by eight bipolar dimensions: definition of success (improvement-normative performance), value (effort-normatively high ability), reasons for satisfaction (hard work-outperforming others), teacher-orientation (learning-performing), view of errors (part of learning weakening of performances), attention (learning process-normative performance), reasons for effort (learning new-performing normatively well) and evaluation criteria (progress-normative).

Secondly, based on the work of Ames (1984), Epstein (1989) identified and described motivational climate by using six structures: task (design of learning activities), authority (location of decision-making), recognition (use of incentives), grouping (individual-co-operative work), evaluation (use of feedback), and time (pace of instruction). The first letters of each dimension form the acronym TARGET. These interdependent structures, which together formulate the context of motivational climate, have been applied to motivational strategies for implementation in the classroom. Most of the motivational climate interventions in physical education context are based on the six-dimensional structure of the TARGET model (Epstein, 1989), but further information is needed about how certain structure itself makes the goals salient.

The task structure includes the goals, which the children are supposed to learn in terms of the content of learning, the design of the context, the level of the difficulty of the task, the available resources in order to finish the task, and help students to establish short-term, self-referenced goals. It affects pupils' judgement about their ability, willingness to apply effort, and feelings of satisfaction (Ames, 1992).

The task structure representing task-involving climate decreases pupils' need for social comparison. Papaioannou and Kouli (1999) manipulated physical education lessons by changing only the task structure. They found that in the lesson comprising of task-involving climate the students had a higher state of self-confidence, lower somatic anxiety, and they perceived higher task-involving and lower ego-involving climate than in the lesson consisting of ego-involving tasks.

The authority structure covers the frequency of participation including decision making between the teacher and the pupils in the physical education context

(Ames, 1992). Goudas, Biddle, Fox, and Underwood (1995) investigated whether manipulating teaching styles would result in different motivation effects. The results indicated that the groups of young adolescent girls who were taught in direct style (Mosston Style B, practice style) perceived less intrinsic motivation and task-involvement compared to those who were taught by using the differentiated teaching style (Mosston Style E, inclusion style). The authority structure can be seen connected to teacher's leadership behaviour, specifically his or her democratic behaviour, meaning that in a task-involving climate the pupil has greater participation in decision-making pertaining to group goals, practice methods, or game strategies.

The recognition structure refers to the methods, which are used to motivate the pupils in physical education lessons and to the recognition of pupils' progress and achievement given by the physical education teacher. The nature of rewards as purposes, criteria, distributions, and publicity affects the pupils' feeling of competence.

The grouping structure includes the teachers' way of organising (competitively, co-operatively, individually, in small or large groups or heterogeneous pairs) in physical education lessons according to the pupils. If the teacher uses heterogeneous and varied grouping arrangements when creating a task-involving climate, pupils' need for social comparison decreases (Polvi & Telama, 2000).

The evaluation structures include standards, methods, and criteria as well as content and frequency of evaluation. Creating a task-involving climate, the teacher stresses private and frequent feedback based on personal improvement, progress toward individual goals, participation, and effort (Epstein, 1989).

The time structures concern the use of time during physical education lessons, which the teachers can affect by giving more time and easier tasks to less able or slower pupils in a task-involving climate (Epstein, 1989). Timing can be seen strongly connected with the other structures, which are described earlier. Flexible timing can be seen in every manipulating process of the structures. The pupils could use time in order to perform a task in a various way.

From pedagogical point of view, the TARGET-structures describe how teacher's certain decisions or arrangements formulate an optimal learning environment for the pupils. These decisions should reflect the pupils' intra-individual effort,

learning, mastery of task, and the importance of participation. The same principles can be found in Mosston and Ashworth's (1994) Spectrum of teaching styles, according to which teaching is a chain of decision-making affecting pupils' thinking, feeling and behaviour. According to Mosston and Ashworth (1994), flexible use of different teaching styles creates the basis for optimal learning environment. However, in order to follow the social-constructivism perspective, most of the decision-making should be made by the pupils. This assumption requires the use of teaching styles from the guided discovery style to the learner-initiated style. In addition, it supports the assumption of the achievement goal theory, which sees a person as active, intentional, goal directed, and operating in a rational manner. Despite minor dissimilarities, such as a teacher in pre-impact set (Mosston & Ashworth, 1994) considers the task goal, grouping, authority, and timing, which are separated in the TARGET-structures or teacher in post-impact set (Mosston & Ashworth, 1994) evaluates the previous sets without separating recognition and evaluating, like the TARGET-structures, these two tools for creating optimal learning environment share the same principles.

Several scales have been developed to measure motivational climate in school physical education and sport context. Papaioannou's (1994) Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ) consists of Task and Ego-Climate with two sub-dimensions (Teacher-Initiated Learning Orientation and Students' Learning Orientation) for task climate, and three sub-dimensions (Students' Competitive Orientation, Students' Worries About Mistakes, and Outcome Orientation Without Effort) for ego-climate. Duda and Whitehead (1998) argue that the LAPOPECQ measures not only situational emphasized goal perspectives, as a motivational climate should, but also dispositional goal perspectives.

Goudas and Biddle (1994) tried to operationalise the concept of motivational climate by four sub-scales of the LAPOPECQ (the Outcome Orientation Without Effort" was excluded) and adding two other factors, namely, students' perceptions of choice and students' perceptions of teachers' support.

This new scale was named the Physical Education Class Climate Scale (PECCS). Further developing needs to be done before the PECCS can be used as a valid measure of motivational climate (Duda & Whitehead, 1998). However, Biddle et al. (1995) translated the English version of the PECCS into French which was

named L'Echelle de La Perception du Climat Motivational (EPCM). The scale had a good construct and predictive validity, and satisfactory internal consistency among French-speaking population (Ntoumanis & Biddle, 1999).

Walling, Duda and Chi (1993) developed the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2), which was based on the previous version of the PMCSQ-1 developed by Seifriz et al. (1992). Based on the responses of 225 American female basketball and volleyball players, exploratory and confirmatory factor analyses revealed a satisfactory level of construct validity of the PMCSQ-2. The newest version of the scale consists of two higher-order scales (Task-Involving and Ego-Involving Climates) each with three sub-scales (Co-Operative Learning, Important Role, and Effort/Improvement) and three for ego-involving climate (Punishment for Mistakes, Unequal Recognition, and Intra-Team Rivalry) (Newton, Duda & Yin, 2000).

Ntoumanis and Biddle (1999) suggest that by adding new items reflecting athletes' perceptions of choice, involvement in decision-making, design of task, and pace of learning into the PMCSQ-2 scale, it would be covering better all aspects of the TARGET structures. A limitation considering this study is that the PMCSQ-2 used in this study is not developed in the context of school physical education. Despite these notions, as pointed out by Newton and Duda (1993), the multidimensional character of the PMCSQ-2 reflects the views of Ames (1992) and Epstein (1989) on the concept of motivational climate. In addition, Ames (1992) has pointed out that sport and academic settings share many structural features on the basis of which the PMCSQ-2 can be considered to be a valid instrument to be used in school physical education context.

Duda (2001) pointed out that the intercorrelations between task-involving and ego-involving climate generally range between -.30 and -.50 revealing that those two dominant dimensions are neither purely orthogonal nor bipolar. Goudas and Biddle (1994) have suggested that the medium correlations between the task and ego-climate mean that there may exist both types of climate in the same situation or at least individuals probably perceive the motivational climate of the situation differently. Supporting previous assumptions, Ryan and Grolnick (1986) and Papaioannou (1994) indicated that there exists a greater within-class than between-classes variability on the students' perceptions of the environment created by the teacher. On the other hand, frequencies of the players' responses to selected perceived motivational coaching climate items in teams, which had

been coached more than four years by the same coach indicated that the coach possibly treated the players in a different way (Liukkonen, 1998).

In addition, athletes' increased satisfaction with their team as a whole decreases divergence in how they view motivational climate in regard to its task and ego-involving attributes (Duda, Newton & Yin, 1999). Furthermore, the older the athletes, the greater the discrepancy in how they perceive the overriding motivational atmosphere in their team (Duda, Newton & Yin, 1999). Motivational climate has been studied in three different achievement settings: education, competitive sport, and physical education. Despite the context, the results concerning associations of motivational outcomes and motivational climate have been in accordance (Ntoumanis & Biddle, 1999).

Task-involving climate has been found to be related to several adaptive cognitive outcomes such as task-orientation (Biddle, Cury, Goudas, Sarrazin, Famose & Durand, 1995; Newton & Duda, 1993), intention to participate (Biddle et al., 1995), intrinsic motivation (Brunel, 1999), perceived competence (Kavussanu & Roberts, 1996), belief that effort and hard work lead to success (Seifriz et al., 1992), belief that the purpose of sport is to develop social and lifetime skills (Ommundsen & Roberts, 1999), positive experiences about coach's leadership style; more instruction, hard training, social support (Balaguer, Crespo & Duda, 1996) and self-efficacy (Kavussanu & Roberts, 1996).

Task-involving climate is also linked to adaptive affective outcomes such as satisfaction (Walling et al., 1993), enjoyment (Liukkonen, 1998; Seifriz et al., 1992), lowered tension (Ommundsen, Roberts & Kavussanu, 1997), students' positive attitudes towards class (Treasure, 1997), satisfaction with the team members, satisfaction with their competitive results, and the current level of their play (Balaguer et al., 1999).

Furthermore, task-involving climate is associated with adaptive behavioural outcomes such as the use of effective learning strategies, learning, training, and a less frequent possibility of avoiding practice (Roberts & Ommundsen, 1996), greater levels of attention (Papaioannou & Kouli, 1999), and respect for rules and social conventions of sport (Papaioannou, 1997).

Ego-involving climate has been found to be associated with maladaptive cognitive, affective, and behavioural outcomes such as ego-orientation (Newton

& Duda, 1993), drop-outs (Whitehead, Andree & Lee, 1997), extrinsic motivation (Brunel, 1999), tension, anxiety and pressure (Ntoumanis & Biddle, 1998), lower effort (Yoo, 1997), strategies of avoiding practice (Ommundsen & Roberts, 1999) decreased interest (Cury et al., 1996), belief that superior ability causes success (Seifriz et al., 1992), and belief that the purpose of sport is to increase social status (Ommundsen et al., 1997).

Gender differences are suggested to exist in perceptions of motivational climate. In physical education context, males perceive stronger ego-involving climate compared to girls (Jaakkola & Sepponen, 1997; Kokkonen, Liukkonen, Jaakkola, Sepponen & Pöllänen, 1999; White, Kavussanu & Guest, 1998). In the sport context, boys perceived weaker task-involving climate in their team than girls (White et al., 1998).

Some researchers (e.g., Orgell & Duda, 1990; Vallerand et al., 1986) have demonstrated the impacts of certain motivational climate on the performance or cognitions of individuals whereas the others have concentrated on altering motivational climate towards task-involvement either in classroom (Ames, 1992), in sport (Lloyd & Fox, 1992), or in physical education context (e.g., Marsh & Peart, 1988; Treasure, 1993; Theeboom, De Knop & Weiss, 1995; Solmon, 1996). Ntoumanis and Biddle (1999) have analysed specifically these interventions in their widely covering review. This review and the latest longitudinal motivational climate interventions (Papaioannou & Digelidis, 1998; Digelidis, 2000) have demonstrated that these interventions managed to increase children's perceptions of task-involving motivational climate.

Papaioannou and Digelidis (1998) implemented an intervention study with a sample of 209 elementary (age 8-12) school children by creating task-involving climate for 65 daily lessons of physical education. The intervention included personal goal-setting, emphasis on co-operation, goal-setting in every task, maximization of academic learning time and children's active participation in the lessons, frequent reminders of the values of personal improvement and co-operation, and task-oriented exercises. The results demonstrated that the intervention programme increased children's perceptions of task-involving climate. The programme had also a positive influence on attitudes towards exercise and attitudes towards helping others.

Digelidis (2000) examined the same motivational variables with a sample of 262 junior (aged 12.5) high school children and 106 senior (aged 15.5) high school children. The control groups consisted of 521 students in junior high school and 528 students in senior high school. Differences compared to previous intervention were the concentration on health issues (e.g., diet) and practical implementation of the intervention, which was planned by two physical education teachers with no postgraduate degrees. The results indicated that the intervention classes perceived teacher-initiated climate as more task-involving and less ego-involving than those in the control groups.

To conclude, motivational climate profiles (high/low task climate and/or high/low ego) researches (e.g., Liukkonen, 1998; Ommundsen & Roberts, 1999) have indicated that ego-involving climate is acceptable if the amount of task-involving climate is high at that time. Still, motivational climate interventions have indicated that generally when task-involving climate is perceived as salient, the individuals adopt adaptive cognitive, affective, or behavioural responses. When ego-involving climate is perceived as stressed, the individuals are more likely to adopt maladaptive responses. However, according to Ntoumanis and Biddle (1999), conceptual relationship (orthogonality) between the two climate domains need to be clarified more specifically in order to help operationalising and validation process of the motivational climate scales. They suggested that the PMCSQ-2 scale, which was used in this research, should be more widely validated in different cultures and new items could be added to the scale from classroom-specific questionnaires.

In addition, domain-specific instruments should be developed in order to capture motivational climate in different achievement settings (e.g., in sport and in school physical education lessons) and in different hierarchical levels (situational, contextual, and global) (Ntoumanis & Biddle, 1999). Furthermore, not only should self-report questionnaires be used more but also qualitative methods as interviews in motivational climate research.

Finally, in order to find out the interactive effect of dispositional and situational goals in motivational outcomes, it has been suggested that interactionist approach should be used in motivational climate research (Duda, 2001; Roberts, 2001). This approach suggests that person-related factors (goal-orientation) and situational factors (objective and/or subjective environmental characteristics) affect goal-involvement (Duda, 2001). According to Dweck & Leggett (1988),

"the role of goal orientation is to determine the probability of adopting certain goals of action and implementing particular behaviour patterns, while situational factors possibly are seen as potentially altering or strengthening these probabilities".

In practice, when individuals' disposition of task or ego-orientation is weak, situational factors, for example, the way of teaching, may more easily manipulate individuals' goal orientation (Roberts, 2001). Correspondingly, the stronger a person's disposition is the less likely it is to be manipulated by situational factors. However, by using this approach Newton and Duda (1999) could not find significant interaction between perceptions of ability with task and ego-orientations and perceptions of task and ego-involving climate whereas Treasure and Roberts (2001) stressed that both dispositional and situational factors need to be considered when predicting motivational processes.

Roberts (2001) emphasised the conceptual role of motivational climate only because it affects individuals' personal assessments which is essential. For that reason research of environment needs extra attention. This must be considered especially in the case of the children while they have not formulated stable personal theories of their achievement (Roberts, 2001).

3.2 Helping Behaviour and Motivational Climate

Helping behaviour is a consequence of a chain of moral processes, which are undergirded by a set of psychological competences such as perspective taking and empathy, moral reasoning, motivational orientations, autonomy, and problem-solving skills (Shields & Bredemeier, 1995). These psychological competences are both affected by person's cognitive development and contextual and situational moral atmosphere (Krebbs, Vermeulen, Carpendale & Denton, 1991).

Pupils' socio-ethical growth takes place in inter-individual interaction that enables them to adopt either negative or positive (pro-social behaviour) forms of social skills (Telama, 2000). Pro-social behaviour including behavioural domains such as positive responses to others' emotional distress, helping others, sharing or donating and co-operation can be defined as voluntarily behaviour intended to

benefit the other (Eisenberg & Fabes, 1998). This concept of helping includes only the outcomes of action, whereas the concept of altruism concentrates more on motivation underlying the behaviour (Pearce & Amato, 1980). Pupil's helping behaviour based on either normative altruism (receiving personal benefit or avoiding criticism) or autonomous altruism when increasing other pupils' wellbeing are primary reasons for helping behaviour (Marcoen, 1999). Thus, pupil's helping behaviour as a social-cognitive skill is also closely connected to his or her moral development in terms of moral functioning such as sportspersonship (Telama, 2000) which can also be developed in sport contexts (Evans & Roberts, 1987) as well as in physical education domain (Romance, Weiss & Bockoven, 1986).

Altogether, helping behaviour can be seen as a moral action which is affected by several factors such as cognitive and social-cognitive, for example, moral reasoning (Janssens & Dekovic, 1997), perspective taking (Martini, Grusec & Bernardini, 2001), empathy-related emotions for instance sympathy (Kienbaum, Volland & Ulich, 2001), personality such as sociability (Silva, 1992), temperament (Carlo, Roecsh & Melby, 1998), and situational factors as cost and benefits (Barnett, Thomson & Schroff, 1987), mood state (Carlson, Charlin & Miller, 1988), earlier experiences on recipients (Fishbein & Kaminski, 1985), and skills relevant to situation (perceived competence to help) (Midlarsky & Hannah, 1985).

According to Rest (1984), moral development theorists agree that moral behaviour is intentional, motivated behaviour. To predict whether a person will behave morally his or her motives must be considered. Today, most researches on moral and pro-social issues are based on a social-cognitive perspective (Roberts, 1992) such as goal-orientation approach (Nicholls, 1989). This suggests that goals reflect the intention of a person and the intentions are considered instrumental to our understanding of achievement behaviour. Understanding pro-social and moral functioning in achievement contexts, the point is to understand the meaning of the context to the individual and the goals the individual tries to accomplish (Roberts & Ommundsen, 1999). The state of goal-involvement (task or ego-involvement), which the individual adopts in achievement situations, is dependent on the interplay between dispositional (task or ego-orientation) and situational factors (task or ego-climate) (Roberts & Ommundsen, 1999).

Dispositional factors may be differentially associated with moral function and maturity (Roberts, 2001). Ego-oriented persons concentrate on themselves and how they rank in comparison with others which may inhibit moral development whereas task-oriented persons feel competent when they have achieved learning which can be considered parallel with the achieving progress in the moral arena (Duda, Olson, & Templin, 1991; Roberts, 2001). In other words, in an ego-involving climate where winning or beating the others is everything, the pupils are less likely to help each other. In addition, their readiness to ask for help is low because it is regarded as an admission of incompetence whereas in a task-involving climate the pupils see request for assistance as a way of learning. Furthermore, in a task-involving climate pupil's integrity of helping can also be increased by stressing autonomy and problem-solving skills (Shields & Bredemeier, 1995).

Pupil's self-selected tasks, individualized goals, and assumption of responsibility increase their feelings of autonomy whereas co-operative group works organised by the pupils themselves foster their social problem-solving skills (Shields & Bredemeier, 1995). Also, explaining power dynamics of the context in terms of group cohesion, leadership capabilities, or institutional roles increase pupils' understanding of their own sources of power and respond to integrity (Shields & Bredemeier, 1995). As noted above, there are theoretical connections between task-involving climate and the development of moral growth. Thus, in this study the creation of task-involving climate, which was based on the combination of interdependent TARGET-structures (Epstein, 1989) and pupils' important role, improvement, and co-operative learning (Newton & Duda, 1993), can be assumed to foster pupils' moral growth.

As for empirical findings in sport, Kavussanu and Rameswaran (2000) found that high ego-orientation corresponded to low levels of moral intention and moral judgement among basketball and ice hockey players. Supporting previous findings, Roberts and Ommundsen (2000) found that when the children were ego-involved they used lower levels of moral reasoning whereas the children who were in task-involvement showed less likelihood to engage in inappropriate behaviours.

Empirical researches concerning pro-social behaviour in school contexts suggest that neither typical classroom environment (Eisenberg & Fabes, 1998) nor school physical education perceived by both teacher and pupils (Varstala, Telama &

Heikinaro-Johansen, 1987) frequently activate pro-social interaction among children. On the other hand, Kahila (1986, 1993) indicated that children's social helping behaviour can also be learned by practising in situations specifically organised for that purpose in physical education lessons. In Kahila's (1993) study, girls were divided in four groups. In Group 1, the girls were systematically assigned new partners every three weeks. In Group 2, the girls themselves choose their partners for every lessons. The girls in Group 3 worked individually, and Group 4 was a control group.

The results revealed that the participants in Group 1 were more willing and motivated to help than the participants in other groups, which emphasised the importance of grouping in the TARGET-model. Thus, Finnish 11-year-old girls' helping behaviour in school physical education lessons increased when giving them an opportunity to co-operate with several other children. According to Kahila (1993) and Polvi and Telama (2000), the development of pupil's social-cognitive skills, such as pro-social behaviour including helping behaviour or moral functioning, are dependent on real inter-individual interaction and co-operation with the others, which is more than just being physically a part of the group.

Papaioannou and Digelidis (1998) showed that children's perceptions of increased task-involving climate had positive influence on attitudes towards helping others, whereas ego-oriented climate inhibited the development of acceptable moral attitudes and behaviour (Ommundsen, Roberts & Lemyre, 2000). Furthermore, Treasure, Roberts, and Standage (1998) found, after connecting dispositional and situational factors with a sample of male soccer players that the low ego-involved players who thought the team atmosphere was ego-involving, had less respect for the rules, officials, and social conventions than players with the low ego-involvement who perceived a low ego-involving atmosphere. On the other hand, Kavussanu and Roberts (1999) found that perceived motivational climate did not predict athletes' moral functioning. Furthermore, participants' moral and pro-social behaviour were found to be related to the motivational climate (task versus ego-involving climate) created by the coaches, athletes, or parents (Seinfriz et al., 1992). Altogether, Smith, Hall and Wilson (1999) suggest that situational goals or contextual morality (Bredemeier, 1985) rather than a particular disposition may be more salient in determining "appropriate" behaviours in sport. Supporting the previous

assumption, the frequency of rule breaking behaviour increases in a motivational climate of competition (Sabatier & Henock, 1996).

According to Eisenberg and Fabes (1998), older people tend to assist more often than younger children. Children's abilities to evaluate situational factors and behavioural options become more complex and probably more accurate with age, and the quality of children's motivation for assisting others changes with age varying from egoistic principles to true altruistic behaviour.

Empirical evidences concerning sex differences in children's pro-social behaviour are equivocal. Eagly and Crowley (1986) conducted a meta-analysis of sex differences in older adolescents' and adults' helping behaviour and found that men helped more than women, particularly in situations where instrumental and chivalrous assistance existed. On the contrary, Eisenberg and Fabes (1998) suggested that girls tend to be more pro-social than boys. Miller, Roberts, Ommundsen and Lemyre (2001) found that despite association between high ego-climate and lower levels of moral functioning for both boys and girls, girls have been found to be at a more advanced level of moral functioning than boys in both climates (Kavussanu & Rameswaran, 2000; Liimatainen, 2000; Miller et al., 2001).

To conclude, based on the achievement goal-orientation approach task-involving motivational climate in terms of grouping and co-operative learning seems to foster or have positive impacts on the development of children's pro-social behaviour or moral functioning both in sport and physical education contexts. Indeed, the varying nature of physical education lessons such as unstable room or genuine conflicts offers good basis for children's socio-ethical education in school physical education. Teachers may increase pupils' motivation toward pro-social behaviour and produce positive social experiences for them in physical education lessons by stressing a task-involving climate that create basis for pupils' moral growth in terms of task-orientation whereas ignoring pupils' co-operation, decision-making, and autonomy and pressuring competition promote ego- orientation and may decrease pupils' pro-social behaviour (Telama, 2000). On the other hand, potential moderating effect of the context (e.g., competitive youth sport) on moral behaviour should be investigated (Treasure, Etnier & Hancock, 2001).

In addition, results for possible gender differences in moral action need to be confirmed and reasons studied, even if both girls and boys similarly commit the acts of cheating in order to beat the opponent (Miller et al., 2001). Finally, the effects of motivational climate created by the parents or guardians on children's moral functioning in sport experiences need to be clarified (Miller et al., 2001). Indeed, Stornes (2001) indicated that among handball players perceived positive leadership styles (democratic behaviour and social support) were positively associated with their pro-social behaviour.

3.3 Teacher's Leadership Style and Motivational Climate

As noted earlier, the creation of task-involving motivational climate depends on several factors such as pupils' dispositions, peer relations, family and so worth which the physical education teacher should take into account when planning physical education lessons. In practice, task-involving motivational climate occurs in teacher's teaching style in several ways such as accepting individual differences, tolerating pupils' mistakes, showing equality and flexibility towards each pupil, emotional understanding of the pupils, and giving more positive feedback to pupils. Indeed, when pupils' responsibility as a decision-maker in physical education lessons increases, teachers can support this process by showing democratic behaviour or giving more social support for successful decisions made by pupils. Thus, the practical creation of task-involving motivational climate is mostly dependent on the selected teaching style or teacher's leadership style, which can be seen parallel. Due to lack of valid teacher's teaching style measures, this study utilizes teacher's leadership style when looking at the effectiveness of the intervention.

The development of pupil's social skills in physical education lessons depends on social interaction including pupil-pupil and teacher-pupil communication. Specially, teacher-pupil communication and behaviour formulate teacher's leadership style, which can be seen as a process influencing others through credibility, capability, and commitment (Murray & Mann, 2001).

One can assume that the physical education teacher can create a task-involving climate, which improves and enhances pupils' social skills and motivation

towards activity by stressing certain leadership style(s). One way to measure it is to use systematic observation methods whereas the other way, as in the present study, is to concentrate on pupils' subjective view or perceptions of teacher's social interaction with them in terms of social support or democratic behaviour.

Overall, leadership is more extensively studied topics in industrial or organizational psychology than in athletic or educational context (Chelladurai, 1984). In sport contexts, the study of leadership has evolved from the research of characteristics and attributes of an efficient leader to the study of actions and behaviours that make up a true leader (Smoll & Smith, 1989) whereas, from pedagogical point of view, pedagogical leadership can be described as a combination of leader's didactical and pedagogical activities (Lonkila, 1990). More recently, studies have concentrated on leader's behaviour subject to his or her personality and requirements of particular situations. Chelladurai and Reimer (1998) in their review have accurately presented a study of leadership in sports through observational method to athletes' subjective view about leadership such as multidimensional model of leadership (MML; Chelladurai & Carron, 1980).

The present study is based on Chelladurai's (1990) Multidimensional Model of Leadership in sport context, which is an extended version from earlier leadership models. This model incorporates conceptual frameworks of trait, behavioural, and leadership theories to address the interaction of the coach and the athlete in sport context (Sherman, Fuller & Speed 2000). In the model athlete's performance and satisfaction are the two main consequences of the interaction between three types of coaching behaviour; required behaviour, actual behaviour, and preferred behaviour of the coach which are influenced by three antecedents; situational characteristics, coach characteristics, and athlete's characteristics (Chelladurai, 1980). If these factors are congruent, the athletes should be satisfied and perform well.

Situational factors, for instance type of sport, size of team, task variability, and conditions of the play (Sherman et al., 2000) together with the characteristics of the group (e.g., gender, age, ability) require that the leader behaves in certain ways. In addition, members preferred certain leader behaviour, which is affected again by member characteristics as well as situational demands.

Finally, leader's actual behaviour perceived by the members is influenced by members' preferences, required behaviour, and also leader's characteristics

including his of her age, gender, and personality. Despite a few empirical validations of the multidimensional model of leadership (e.g., Chelladurai, 1984; Weiss & Friedrichs, 1986), the model still needs to be validated more extensively, for example by operationalising required behaviour (Chelladurai & Riemer, 1998).

Based on the Multidimensional model, the Leadership Scale for Sport (LSS; Chelladurai & Saleh, 1980) inventory was developed to measure preferred and actual or perceived leader behaviour through five separate dimensions; Training and Instruction (coaching behaviour aimed at improving athletes' performance by emphasising and facilitating hard and strenuous training), Democratic Behaviour (behaviour of the coach, which allows greater participation by athletes in decisions pertaining to group goals, practice methods, and game tactics and strategies), Autocratic Behaviour (coaching behaviour that involves independence in decision-making and which stresses personal authority), Social Support (behaviour of the coach characterised by concern for individual athletes, for their welfare, for positive group atmosphere, and for warm interpersonal relations with members), and Positive Feedback (coaching behaviour that reinforces athlete by recognising and rewarding good performance). Empirically, the LSS-scale has been used to measure both athletes' preference for specific leader behaviour, athletes' perceptions of their coaches' leader behaviour, and coaches' perceptions of their own behaviour (Chelladurai & Reimer, 1998).

Recently, in order to develop the LSS scale, Zhang and Jensen (1997) have added one dimension (situational consideration) to the LSS scale and renamed the scale as the Revised Leadership Scale for Sport (RLLS). However, there exists a lack of cross-cultural validity of the RLLS (Jambor & Zhang, 1997).

A number of studies concerning the interactions of these variables show that in a case of coaches' self-perception in comparison with athletes' perceptions coaches evaluations are better than the athletes' in terms of Training and Instruction, Democratic, Social Support and Reward Dimensions (e.g., Liukkonen, 1993; Salminen & Liukkonen, 1996; Serpa, Pataco & Santos, 1991). Thus, the coaches evaluate themselves more positively than the athletes involved with the coaching process (Horne & Carron, 1985). Furthermore, female coaches seem to have a more realistic picture of themselves as leaders of the training groups than male coaches (Salminen & Liukkonen, 1996). In addition, female coaches proved to

be less authoritarian (Chelladurai & Saleh, 1978), more supportive and rewarding (Salminen, Liukkonen & Telama, 1992) than male coaches.

As regards preferred coaching behaviour, according to Prapavessis and Gordon (1989) coaches are more authoritarian than what athletes prefer. However, with increasing sport experience, athletes show an increasing preference for an authoritarian approach by coaches (Chelladurai, 1984) as well as social support behaviour (Chelladurai & Carron, 1983). Males expected more autocratic and social supportive behaviour than females (Chelladurai & Saleh, 1978; Terry, 1984). Females preferred their coaches show more democratic behaviour than male athletes (Amorose & Horn, 2000; Chelladurai & Saleh, 1978; Chelladurai & Arnott, 1985).

This study concentrated on pupils' perceptions of teacher's actual behaviour, which has been measured by using two dimensions of the LSS-scale (Chelladurai & Saleh, 1980) named Democratic Behaviour and Social Support Behaviour. The reason for selection was twofold: firstly, Liukkonen (1993) had already validated these dimensions in Finnish culture and secondly, these dimensions share many overlapping features with the TARGET-model (Epstein, 1989) structures as authority, rewards, and evaluation. Amorose and Horn (2000) found that democratic leadership style was perceived more by athletes with higher intrinsic motivation. Thus, teacher's democratic behaviour may enhance both pupils' perceptions of competence and their sense of self-determination. In practice, Liukkonen, Laakso and Telama (1996) indicated after analysing 128 coaching sessions (two thirds of the sample were aged between 11 and 15) that children neither have a great role in decision-making nor take part in activities demanding personal initiative, even if they expect a more democratic leadership style from their coaches (Salminen & Liukkonen, 1996). Similarly, with increasing sport experience, athletes show an increasing preference for social support behaviour given by coach (Chelladurai & Carron, 1983). Specially, low self-esteem children, who need task-involving climate most, responded more positively to coaches who are trained to be reinforcing and supportive than children high in self-esteem (Smith, Smoll & Curtis, 1979).

Chelladurais' (1990) model concentrates on the antecedents and consequences of the leadership practices exhibited by coaches and has implications for athlete motivation, but at the same time "the model provides limited insight into why

and how divergent leader behaviours have differential effects in terms of athletes behaviour in the athletic domain" (Duda & Balaquer, 1999).

For that reason Balaguer and colleagues (e.g., Balaguer, Crespo & Duda, 1996; Balaguer, Duda & Crespo, 1999; Balaguer, Duda & Mayo, 1997) combined both goal orientations and perceptions of the climate in relation to athletes' perception of the leadership style exhibited by coaches. The results showed that tennis and handball players' perceptions of a task-involving environment positively corresponded both to the view that the coach provides higher levels of training, instruction, social support and perceived improvement in tactical, technical, psychological, and competitive facets of tennis and handball performance. In addition, Penedo and Ferreira (2001) also found positive association between task-involving climate and behaviour of leadership such as social support and democratic behaviour.

Duda (2001) summarises the series of motivational climate and leadership investigations by reporting that if the situations stressed by the coach are viewed as more task-involving, handball players perceived greater individual and team improvement in the physical aspects of the sport. Players who perceived their coach to stress ego-involving climate were less satisfied. Balaguer and colleagues' (1997) findings with the sample of female handball players were consonant with the previous research indicating that elite athletes who perceived task-involving climate felt they were receiving more "coaching", being challenged more in training and being treated as worthwhile individuals. Furthermore, coaches who are competent, friendly, social supporting, but also demanding and who stress motivational climate determined by team-cohesion and task-orientation have positive influence on athletes' career decision (Saborowski, Alfermann & Wurth, 1999).

Duda (2001) pointed out that the previous models neglect variables reflecting motivational processes, which stem from contemporary theories of motivation. In order to improve previous models of leadership behaviour, Duda and Balaguer (1999) have introduced an integrated model which extends existing models of leadership by specifying coaches' actual behaviours, athletes' perceptions of these behaviours, and their preferences concerning the same can be analysed in terms of their task and ego-involving characteristics. Specifically, individual differences in goal-orientations are assimilated into the model as antecedent

variables: as attributes of the coach and athletes. The new model needs to be systematically tested in the future (Duda, 2001).

All in all, the LSS-scale dimensions such as social support and democratic behaviour and the TARGET-model (Epstein, 1989) structures such as authority, rewards, and evaluation share many overlapping features. Thus, teacher's leadership style in terms of social support and democratic behaviour increases by stressing task-involving climate in physical education lessons. Although the LSS has been used mainly to clarify coaches' functioning in sport, the teacher-pupils relationship in school can be analysed satisfactory with this scale, because leading shares the same principles in school physical education lessons as among athletes.

4 AIMS, TASKS, AND HYPOTHESES OF THE STUDY

The primary aim of this study was to analyse changes in student's perceptions of task-involving motivational climate, teacher's leadership style, and self-reported helping behaviour through one academic-year intervention directed toward increasing task-involvement during physical education lessons. The TARGET-model structures (Epstein, 1989) in accordance with motivational climate structures determined by Newton and Duda (1993) were used in the creation of task-involving motivational climate. Furthermore, the creation of task-involving climate in experimental schools' physical education lessons demands changes in teacher's leadership style in terms of increased socially supporting and democratic behaviour toward pupils. Finally, increased task-involving motivational climate should increase pupils' helping behaviour to each other. Ego-involving climate was not the focus of this study, meaning that no effort was done in order to decrease it.

The theoretical viewpoint of this study evolves from social-psychological aspects of physical education and includes the variables of pupil's perception of their motivational climate, helping behaviour and teachers' leadership style in terms of social support and democratic behaviour in Figure 1. (Framework of the whole intervention including all variables is presented in Appendix 1).

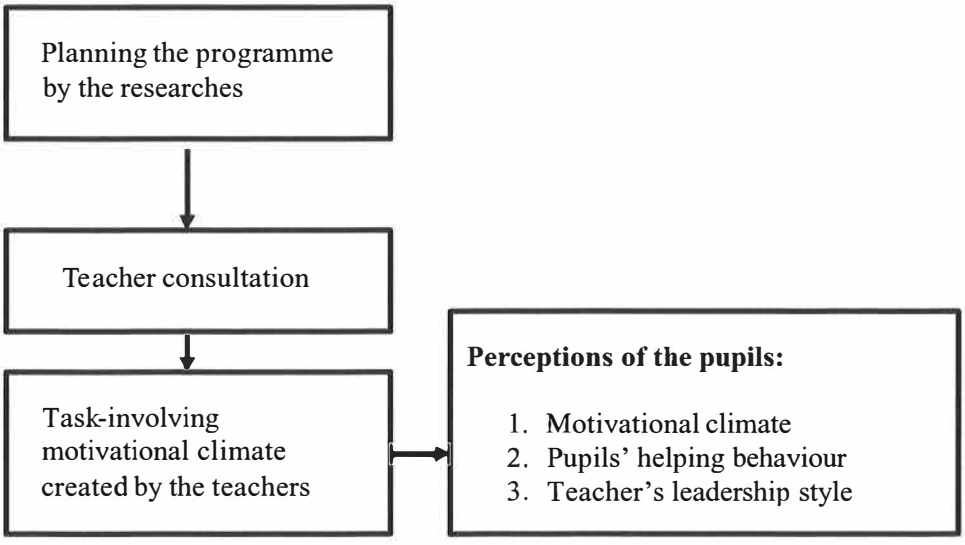

Figure 1. The framework of the intervention

The main research tasks and hypotheses are the following:

1. To analyse whether students' perceptions of task-involving climate in their physical education lessons change through the intervention

Hypothesis 1: Experimental students' perception of task-involving climate increases through the intervention

Hypothesis 2: Results in students' perceptions of task-involving climate through the intervention are similar for boys and girls

Note: Ego-involving climate was measured in order to clarify whether the relationship between task and ego-involving motivational climates is orthogonal or bipolar

2. To analyse whether student's self-reported helping behaviour in their physical education lessons change through the intervention

Hypothesis 3: Experimental students' self-reported helping behaviour increases through the intervention

Hypothesis 4: Results in students' self-reported helping behaviour through the intervention are similar for boys and girls

3. To analyse whether students' perceptions of teacher's leadership style in terms of social support and democratic behaviour in their physical education lessons change through the intervention.

Hypothesis 5: Teacher's leadership style in terms of social support and democratic behaviour increases through the intervention

Hypothesis 6: Results in teacher's leadership style in terms of social support and democratic behaviour through the intervention are similar for boys and girls

The secondary research task is:

4. To analyse the changes of task-involving climate at the teacher and physical education group levels

Hypothesis 7: Changes in pupils' perception of task-involving climate both at the teacher and physical education group levels follow the findings at the experimental-control schools level

5 MATERIAL AND METHODS

5.1 Participants and Design

The participants of the study were 461 Finnish ninth grade (15-year-old) pupils. The experimental group consisted of 190 pupils, 93 girls and 97 boys, placed in 9 classes and taught by four physical education teachers (two men and two women). Due to 12 missing cases in the student sample (total loss 6.3%) refusing to respond to questionnaires or responses being inappropriate, the final analyses were conducted with 178 students in experimental groups, 87 girls and 91 boys. Five teachers were originally recruited for the intervention programme, but one teacher withdrew from intervention in December. Students who attended the classes but did not participate in the study are excluded in the study.

The control group included 271 pupils, 129 girls and 142 boys, representing 13 classes taught by five teachers. Two teachers from the same control school were unable to deliver the end-measurements, which caused several drop-outs among control students. Thus, the final analyses for control groups were conducted with 155 pupils, 59 girls and 96 boys, representing 8 classes taught by three teachers (two men and one woman).

This quasi-experimental study represented non-equivalent control group design, which is used when groups cannot be randomly formed. The purpose of this design is to fit the settings more like the real world while still controlling as many of the threats to internal validity as possible (Thomas & Nelson, 1996). Thus, experimental and control teachers represented different schools, which impeded the interaction of the experimental and control pupils. Teachers were recruited from volunteers and all of them were officially qualified physical education teachers. Experimental teachers had to be located near Jyväskylä for practical reasons, such as repeated meetings with the teachers. Two of them were from Jyväskylä and two 15 km from Jyväskylä, whereas the control teachers lived outside Jyväskylä. The control teachers were from southern Finland. Teachers' age range in the experimental groups was between 40 and 60 and for control schools between 30 and 50.

The baseline measurements were implemented in September 1999 and the end-measurements at the end of April 2000. The pupils responded to a set of questionnaires voluntarily and unanimously, therefore both the measurements were connected on the basis of the pupils' day of birth. Due to the large number of questionnaires, the pupils used two consecutive physical education lessons for responding to them both in September and in April. The pupils were informed about the questionnaires at the beginning of the intervention and they were asked to answer according to their perceptions, not goals of the intervention. Responding to the questionnaires was implemented in the pupils' own sports hall under the supervision of their teacher. The intervention was planned and implemented together by the researches. After the end-measurements the researchers started independent writing processes. In his study, Jaakkola (Jaakkola, 2002) reported the effects of the intervention on students' intrinsic, extrinsic, and amotivation as well as their perceived physical competence and goal orientation. The teaching methods and measurements of the intervention appear in chronological order on the next page in Figure 2.

September 1999	Baseline measurements of the students - two consecutive lessons
October	Distributions of written material for the teachers Consultation meetings started with the teachers
November	Analysing teacher's own teaching behaviour Teachers planned their own goal-setting programme Increasing autonomy of physical education lessons
December	Goal-setting programmes for students started Students' self-evaluations started
January 2000	Periodical thematic implementation of the intervention started - students' important role
February	Periodical thematic implementation of the intervention - students' important role/own improvement
March	Periodical thematic implementation of the intervention - students' own improvement/co-operative methods
April	Periodical thematic implementation of the intervention - students' co-operative methods Students' self-evaluations ended Consultation meetings ended End measurements of the students - two consecutive lessons

Figure 2. Teaching practices and measurements used in the intervention in chronological order. Note: The figure above represents only the intervention in the experimental schools. The control schools were not delivered any treatment.

The intervention was implemented by the teachers, thus, the pupils were only influenced by their own teacher. Finnish physical education teachers' relatively high independence of other school authorities, for example, principal of the school or decentralised school policy such as curriculum (Peruskoulun opetussuunnitelma, 1994), gives a great opportunity for the teacher to modify his or her lessons towards task-involving motivational climate or, on the other hand, not to do that. The intervention consisted of two different levels. The first level was consultation between the researchers and the teachers and the second was the interaction between the teachers and the students. The researchers were able to control the first level of intervention whereas the controllability of the second level was dependent on the feedback and notes given by the teachers. Thus, the researchers did not have an objective general view about the interaction between the teacher and the students during the intervention.

Next, the teaching methods and measures of the intervention as well as the practical implementation of the intervention at the researchers-teacher as well as teacher-students level are described briefly. The complete description of the intervention including the planning process, measurements, contents of the meetings, and evaluation of the intervention is described in Appendix 1.

5.1.1 Intervention at the researchers-teacher level

In order to carry out the intervention, 20 formal meetings took place with each teacher. Eight of them took place in 1999, 10 in 2000 and two after the end-measurements. Altogether, 60 meetings were held with the four teachers. All meetings were private face-to-face-meetings except for one school where the male and the female teacher from the same school were consulted together.

The first meeting with the teachers took place in the beginning of October 1999 and the last was at the end of April 2000. The first eight meetings with the teachers concentrated more on theory and the concept of intervention variables whereas the rest of nine meetings consisted mainly of transferring the theory into practise in physical education lessons. The meetings were implemented during the teachers' working day, while the students from the Department of Physical Education, University of Jyväskylä organised and gave the physical education lessons on behalf of the teachers. This arrangement did not concern intervention classes, which were taught by the same teacher through the intervention. In all meetings two researchers were present. Both of them kept a diary in order to

confirm mutual understanding. The time frame of each meeting was approximately one and a half hours and the concept of the meetings was identical for all teachers. Telephone connection was also available between the teachers and the researchers.

The purpose of the meetings was to educate and counsel the teachers as well as to deliver materials like articles about subjects' matters. In addition, the teachers were shown how to invent and use the drills, which stressed the characteristics of task-involving climate (TARGET-model). Furthermore, the basic principles of the styles of spectrum of teaching styles (Mosston & Assworth, 1994) were clarified to the teachers in order to help them to implement the intervention. Between the meetings the teachers were supposed to acquaint themselves with ideas and theories, which were handled in the previous meetings.

In the following meetings teachers' experiences of the practical implementation were analysed before moving to the following subjects. They were also asked to keep a diary on the practical solutions (e.g., drills) they had done between the meetings.

The control schools were recruited from volunteers based on the fact that the two measurements would be conducted during the next academic year. The teachers knew only that the measurements were dealing with the motivation of pupils in physical education lessons. The teachers of the control schools were not involved in any meetings during the intervention year.

5.1.2 Intervention at the teacher-student level

The practical implementation of this intervention was based on the combinations of Epstein's (1989) six-structured TARGET-model (task, authority, rewards, grouping, evaluation, and timing) and Newton & Duda's (1993) determination of task-involving motivational climate including pupils' important role, improvement, and co-operative learning. Thus, in this study the co-operation of these interdependent structures defines the motivational climate in physical education lessons. In practice, the teachers discussed the concept of this intervention with the pupils in each physical education lesson. The first five minutes of the lesson were used to determine the goal, which was followed

during the lesson. The last five minutes of the physical education lesson were used for the evaluating process of that specific goal.

Based on previous intervention studies (e.g., Papaioannou & Digelidis, 1998; Treasure, 1993), this intervention also identified the teaching strategies (e.g., goal-setting, self-evaluation), which are essential in the creation of the task-involving climate in school system. Finally, some examples from each strategy were explained to the teachers in terms of specific teaching practices in order to make sure their understanding. Otherwise, the teachers were responsible for the practical implementation of the intervention, which is described in the following sections reflecting activity in physical education lessons in terms of the TARGET-model.

Task structures reflecting task-involving climate were explained to the pupils when they themselves planned the drills or methods which were used under physical education teachers' supervision (Appendix 1; Figure 3). This helped pupils to understand why one person is able to do the same task with standards different from another person. For example, if the pupil is twice smaller than the other what can we do to make him feel competent. The bigger pupils understood the point when the sport domain changed from basketball to gymnastics. In addition, the teacher divided one physical education group in small groups, which included both pupils with high physical education grade (assumption that some of them had high perceived competence) and pupils with low physical education grade (some of them had low perceived competence). After that they analysed their own behaviour in physical education lessons based on the TARGET-model and shared the ideas with each other. This drill made pupils with higher perceived competence understand better the affective, cognitive, and behavioural outcomes of pupils with low perceived competence and *vice versa*. In addition, in order to support the task structure, the individual goal-setting programme for pupils was implemented at the same time (Appendix 5). The purpose of the goal-setting was to minimize social comparison and to affect the pupils' attributions by showing that anyone may improve performance if he or she practises enough. The pupils planned the goal-setting programme for themselves, which they implemented and controlled by themselves. Some of the pupils with behaving problems planned each physical education lesson separately.

In order to make sure that the task-involving climate in physical education lessons was stressed in terms of authority structure the goal-setting programme for teachers (Appendix 4) was implemented. It helped the teachers to evaluate their teaching methods and concentrate on their weaknesses in teaching during the intervention. After that, the teachers gave the pupils a possibility to choose one out of three sport domains. Within this score, the pupils took care of all arrangements (e.g., transport, tickets) and discussed the details with the teacher later. Some pupils also planned the specific, short-run curriculum for themselves for the next four weeks. In addition, an effort was made to utilize the authority and autonomy structures outside school. For example, the pupils kept diaries about things they had done in the evening (e.g., an over-weight girl could go for a walk with her dog in the evening and keep a diary about the feelings caused by the long walk). These activities were noted when giving the feedback or evaluation as a physical education grade. Increasing the pupils' responsibility and independence was closely connected to the pupils' goal-setting programme.

Rewarding was based on the process and product-rewarding (Ames, 1984), including either co-operative or personal development goals. The learning process itself was stressed when the pupils for example were not able to score the basket. At that time, teachers' explanation concentrated on what was good in the performance. The teachers stressed the pupils' co-operative and personal development (goal-setting programmes) by rewarding. At the same time, the teachers could regulate the timing or difficulty of the task by controlling the other sub-dimension of the TARGET-model, which led to the feelings of success and competence in the pupils. In addition, the pupils were rewarded by each other (co-operative rewarding). At the end of each lesson, the pupils evaluated together how well the goal was accomplished and thus, gave positive and constructive support to each other. Furthermore, the pupils needed to evaluate themselves while implementing the goal-setting programme. This self-rewarding structure method made it easier for the pupils to get private and continuous rewarding which was based on individual accomplishments, improvement, and effort.

Speaking of grouping, in order to create task-involving climate, teachers stressed either individual or co-operative tasks. Each physical education lesson, test period, and goal-setting programme consisted of individual goals. The pupils were allowed to choose whether to work alone or in small groups after the meaning of grouping had been explained to them. They also participated in the selection process when formulating the teams. The pupils made the decision

about which pupils play together or formulated the drills in the way that the pupils with low perceived competence were able to teach the specific sport domain, for example, self-defence to the pupils with higher perceived competence. At the end of the lessons the pupils were evaluated privately or together as a group depending on the goal of the physical education lesson. Social comparison was avoided in each conversation. As earlier the pupils were able to share the feelings about grouping at the end of the lesson, which helped the teacher to analyse pupils' understanding of the reasons for different grouping.

Evaluation structure was implemented by using a self-evaluation format (Appendix 6). The completion of the format took one half of the academic school year and was implemented, controlled, and evaluated by the pupils themselves. They evaluated and reflected their physical education grade to the meaning of physical education lesson. The aim was to indicate that more important things than beating the others or showing the ability exist in the physical education lesson and that those other things also consist of a part of their physical education grade. In addition, the teachers tried to erase the gap between the school physical activity and the activity outside school. They asked the pupils to describe the importance of a sport and develop a training programme for the future and write it down. The purpose of this writing was to make the pupils see that school physical education lessons can provide useful knowledge or skills concerning activity outside school.

The pupils defined timing by themselves when they decided for how long they performed a certain task depending on its demanding level, and automatically changed the demands of the task if necessary. If the pupils misused the given opportunity the teachers reminded them of the responsibility and the goals of the lesson at the end of the lesson. Thus, the pupils were responsible for the choices they made during the physical education lessons, and they needed to understand the consequences of their actions. Furthermore, the lessons during the intervention concentrated more on positive feelings caused by the task than effectiveness in terms of the use of time. The teachers gave the pupils a chance to go to the sports hall before the beginning of the physical education lesson or between other academic lessons to play or practise new skills. The idea was to increase pupils' physical activity by showing that exercise is not restricted only to physical education lessons, and to demonstrate that frequent exercise (15 minutes) in the middle of the school day as well as exercise outside school support each other.

The important role, improvement, and co-operative learning (Newton & Duda, 1993) were handled together with the principles of the TARGET-model. In practice, the theme of the pupils' important role suited best for the groups with heterogeneous skills where the pupils worked together or in small groups. For example, in ice hockey, volleyball, and football lessons the pupils who had forgotten the equipment counted how many passes were given and to whom. At the end of the lesson, the role of each player could be indicated with the statistics made by other pupils. In these conversations and lessons each pupil had an important role and all of them participated in physical education lessons.

Pupils' improvement was stressed when the pupils concentrated more on developing their physical skills alone (e.g., in slalom, self-defence, work-out, golf, swimming, gymnastics). Following the goal-setting programme, the pupils noticed their improvement in different achievement settings. This arrangement also decreased the possibility of social comparison.

Dancing, first aid, and lifesaving were particular suitable sport domains for teaching co-operative learning. These sport contexts offered the teacher a good opportunity to guide the pupils to consider each other as lifesavers in an arranged accident situation.

5.2 Statistical Methods

Confirmatory factor analyses were conducted to investigate the structural validity of the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Walling et al., 1993; Appendix 8). Due to the shortened version of the Helping Behaviour Scale (Kahila, 1993; Liimatainen, 2000; Appendix 10) and the Leadership for Sports Scale (LSS; Chelladurai & Saleh, 1980; Appendix 12), these measures were analysed with explorative factor analyses. The correlations among the dimensions were examined to clarify the predictive validity of the scales whereas Cronbach's alpha coefficients indicated the internal consistency of the scales.

The impact of the task-involving motivational climate intervention on outcome variables, effort/improvement, ego-climate, and co-operative learning, helping behaviour, and teacher's teaching style was tested using 2x2x2 series of

multivariate analyses of variance (MANOVA) with experimental-control (2) and gender (2) as a between-subjects factor and time (2) as a repeated measures factor. In addition, the effect sizes (ES) were calculated to indicate the meaningfulness of each change.

5.2.1 Measures

Self-report questionnaire package for the students was used to assess motivational climate, helping behaviour, and teacher's leadership style variables. All the scales were translated into Finnish by a panel of experts and later back into English. The back-translated English version was compared to the original version for consistency and those items which showed a number of possible meanings in Finnish were discussed by the panel of experts in order to redraft them as accurately as possible. The translated Finnish versions of the scales used in this intervention are presented in Appendix 7.

The perceived motivational climate was analysed using the adapted Finnish version of the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Walling et al., 1993). The original PMCSQ-2 scale was based on the previous academic and sport research (e.g., PMCSQ-1 with 300 items), which was later decreased into 42 items by a group of experts. The scale was originally administered to 225 American female basketball and volleyball players, but its' applied version is used in school physical education context (Jaakkola & Sepponen, 1997; Kokkonen & Pöllänen 1999). Construct validity of the scale was tested with explorative factor analyses, which revealed a six-factor structure with 29 items (Duda & Whitehead, 1998). The task-climate included three factors named Improvement, Important Role, and Co-operative Learning. The ego-climate consisted of three factors named Unequal Recognition, Punishment for Mistakes, and Intra-Team Rivalry. In addition, the analyses showed that the hierarchical structure of the PMCSQ-2 (mastery and performance second-order factors underpinned by six first-order structures) fitted the data better than the six sub-scale non-hierarchical structure (Newton, Duda & Yin, 2000). Furthermore, this version of the scale had acceptable internal reliability (Duda & Whitehead, 1998; Newton, Duda & Yin, 2000), reliability (Newton, Duda & Yin, 2000) and some overlap with the dimensions identified by Ames (1992). In Finland, the Finnish version of the PMCSQ-2 (Jaakkola & Sepponen, 1997; Kokkonen & Pöllänen, 1999) has revealed satisfactory level of internal consistency in all six

dimensions (Cronbach-Alfa >.68), except in the case of intra-team rivalry (Cronbach-Alfa >.52). The stem for items was " In the following you are asked to evaluate yourself and your physical education group in general ". Responses were indicated on the 5-point Likert Scale ranging from 1= strongly disagree to 5= strongly agree.

Confirmatory Factor Analysis (LISREL 8.14; Jöreskog & Sörbom, 1996) for the PMCSQ-2 was conducted in order to find out whether the model of two higher order scales each with three sub-scales fitted the data. The overall fit information Chi Square (x^2) = 1217,34, Degrees of Freedom (df) = 370, P-value = 0.00 (reference value for reasonable model >0.05), Root Mean Square Error of Approximation (RMSEA) = 0.083 (reference value for reasonable model <0.05), Goodness of Fit Index (GFI) = 0.80 (reference value for reasonable model >0.90), and Normed Fit Index (NFI)= 0.70 (reference value for reasonable model >0.90) indicated that the model did not support the six-scale structure of PMCSQ-2. Thus, explorative factor analysis with principal axis factoring and oblimin rotation were applied in order to examine the factor structure of the PMCSQ-2 separately for baseline and end-measurements. Twelve items, which failed to load on particular factor at the value of .30 were deleted. The final analysis resulted three factors for both measurements with eigenvalues higher than one. These factors were named Effort/Improvement, Ego-Climate, and Co-Operative Learning in Table 1 (next page).

In baseline measurements, the first Effort/Improvement factory included three items suggesting improvement and two items implying effort with loadings greater than .40. In addition, this factor included one item "The teacher believes that all of us are crucial to the success of the class" implying an important role (.43).

The second factor comprised of eight items suggesting an ego-involving climate with loadings greater than .43. The third factor contained three items with loadings greater than .58 implying co-operative learning. At the end of the measurement, the same three factors were found. In addition, due to identical factor structure for girls and boys separately, the factor structure of the PMCSQ-2 included boys and girls together.

Table 1. The Factor Loadings of the Adapted Version of the PMCSQ-2 and Commonalities in Baseline and End-Measurement (n= 333)

	Baseline loadings of the factors				End loadings of the factors			
Items	I	II	III	h^2	I	II	III	h^2
Effort/Improvement								
18. ... to improve each game/practise	**.65**	.12	.02	.35	**.62**	.13	.02	.35
24. ... emphasis on trying your best	**.59**	-.12	.02	.44	**.49**	-.22	.11	.44
19. ... trying hard is rewarded	**.56**	.02	.02	.33	**.65**	.02	.02	.40
13. ... successful when they improve	**.49**	.02	.02	.28	**.50**	-.10	.02	.34
16. ... crucial to the success of the class	**.43**	.02	-.16	.32	**.52**	-.02	.23	.47
12. ... to work on their weaknesses	**.40**	.02	-.12	.25	**.33**	.02	.22	.26
Ego-Climate								
9. ... his or her attention to the 'stars'	.02	**.81**	.02	.64	-.13	**.70**	.03	.58
15.... some pupils more than others	.03	**.78**	.02	.60	.02	**.78**	.02	.60
20.... she or he thinks are the best pupils	.14	**.76**	.02	.53	.15	**.69**	.02	.42
3.... teacher has her/his favourites	.03	**.72**	.03	.51	-.11	**.60**	.02	.41
23.... pupils 'get noticed' by the teacher	-.21	**.68**	.02	.57	-.15	**.75**	.02	.67
17....when they outplay classmates	.02	**.54**	.12	.36	.02	**.66**	.02	.43
8.... yells at pupils for messing up	.03	**.47**	.02	.22	.02	**.49**	.02	.22
2.....mad when a pupil makes a mistake	-.14	**.43**	.02	.27	-.23	**.54**	.02	.41
Co-operative Learning								
22.....each other to get better and excel	.03	.02	**-.81**	.63	.02	.02	**.81**	.62
7.....pupils help each other learn	.03	.02	**-.64**	.47	.02	.03	**.77**	.58
25.....really 'work together ' as a team	.04	.02	**-.58**	.35	.11	.03	**.52**	.33
Percent of variance (%)	8.11	29.2	4.54		11.2	28.3	4.70	
Eigenvalue	1.9	5.5	1.3		2.4	5.4	1.3	

h^2 = commonality

The correlations of the baseline measurement between the Effort/Improvement and Co-operative Learning factors were .38 and in end-measurement .46, between Co-operative Learning and Ego-Climate -.33 and -.17, and between Effort/Improvement and Ego-Climate -.38 and -.42, respectively. The internal consistency of the scales was satisfactory for boys and girls (Table 2, next page).

Table 2. Cronbach's Alpha Coefficients of the PMCSQ-2 Separately for Boys (n= 187) and Girls (n= 146)

	Baseline Measurement		End Measurement	
	Boys	Girls	Boys	Girls
Alpha if item deleted				
Effort/Improvement				
18. … to improve each game/practice	.74	.51	.76	.81
24. … emphasis on trying your best	.71	.53	.74	.76
19. … trying hard is rewarded	.73	.56	.76	.76
12. … to work on their weaknesses	.73	.60	.76	.80
13. … successful when they improve	.76	.56	.76	.78
16. … crucial to the success of the class	.73	.55	.75	.74
Alpha for the total scale	**.77**	**.60**	**.78**	**.81**
Ego-Climate				
9. … his or her attention to the 'stars'	.84	.83	.81	.86
15. … some pupils more than others	.84	.84	.81	.86
20. … she/he thinks are the best pupils	.85	.84	.84	.87
3. … teacher has her/his favourites	.83	.85	.82	.88
23... pupils 'get noticed' by the teacher	.85	.84	.81	.86
17. … when they outplay classmates	.86	.85	.82	.87
8. … yells at pupils for messing up	.87	.87	.84	.90
2. ... mad when a pupil makes a mistake	.87	.85	.83	.88
Alpha for the total scale	**.87**	**.86**	**.84**	**.89**
Co-operative Learning				
22. … each other to get better and excel	.53	.62	.59	.61
7. … pupils help each other learn	.60	.61	.65	.61
25. … really 'work together ' as a team	.71	.80	.74	.83
Alpha for the total scale	**.71**	**.76**	**.75**	**.77**

In this study, the examination of the psychometric properties of the PMCSQ-2 in terms of the hierarchical structure did not support the earlier finding (Newton et al., 2000). On the other hand, similarities between this study and other studies (Newton et al., 2000) existed, for example the effort and improvement

components formed one dimension. Finally, the six dimensions of the PMCSQ-2 were not found in this sample, which supports the earlier finding of the PMCSQ-2 in Finnish culture (Kokkonen & Pöllänen, 1998).

Helping behaviour was analysed by using the shortened version of the Helping Behaviour Scale developed by Kahila (1993) and Liimatainen (2000), utilising the 44 items Helping Dispositions Scales (HDS; Severy, 1975). Kahila (1993) and Liimatainen (2000) used the Finnish version of this scale including five dimensions with the satisfactory level of internal reliability (>.71) and validity. In this study, only two dimensions including willingness to help and unselfishness from the original HDS scale was used. The stem for items was "In the following you are asked to evaluate yourself and your physical education group in general". Responses were indicated on the 5-point Likert Scale ranging from 1= strongly disagree to 5= strongly agree.

Explorative factor analysis with principal axis factor analysis and oblimin rotation were applied in order to examine the factor structure of the Helping Behaviour Scale separately for baseline and end-measurements. It resulted in two factors; Willingness to help and Selfishness for both measurements with eigenvalues higher than one. However, due to factors' high inter-correlation (>.60) only one factor with principal component factor analyses was formulated. Due to identical factor structure for girls and boys separately, the factor structure of the Helping Behaviour Scale included boys and girls together. The item loadings are shown in Table 3 (next page).

Table 3. The Factor Loadings of the Helping Behaviour and Commonalities (n=333).

Item	Baseline Loadings	h^2	End Loadings	h^2
Helping Behaviour				
9. I am happy to help, if... needs my help	.89	.79	.84	.71
7. I really like to have an opportunity to help	.84	.71	.83	.68
3. I really like helping others	.84	.70	.84	.71
1. I am happy, if I have the possibility to help	.83	.68	.82	.68
4...someone else doesn't, I am happy to help	.79	.62	.85	.73
6. I like it, if someone asks for my help	.73	.53	.72	.52
5. It is not my concern to help, if... needs help	.70	.49	.53	.28
Percent of variance (%)	64.5		61.4	
Eigenvalue	4.5		4.3	

h^2 = communality

The internal consistency of the Helping Behaviour Scale was satisfactory for boys and girls (Table 4).

Table 4. Cronbach's Alpha Coefficients of the Helping Behaviour Scale Separately for Boys (n= 187) and Girls (n= 146).

	Baseline Measurement		End Measurement	
	Boys	Girls	Boys	Girls
Alpha if item deleted				
9. I am happy to help, if... needs my help	.84	.86	.84	.89
7. I really like to have an opportunity to help ...	.86	.85	.85	.89
3. I really like helping others	.85	.87	.84	.88
1. I am happy, if I have the possibility to help	.86	.86	.84	.90
4...someone else doesn't, I am happy to help him	.87	.87	.83	.90
6. I like it, if someone asks for my help	.87	.88	.85	.90
5. It is not my concern to help, if... needs help	.88	.89	.89	.92
Alpha for the total scale	**.88**	**.89**	**.87**	**.91**

Teachers' leadership style was analysed using a shortened and adapted Finnish version (Liukkonen, 1993) of the Leadership Scale for Sports (the LSS; Chelladurai & Saleh, 1980). The original scale consists of 40 items representing five dimensions (Training and Instruction Behaviour, Democratic Behaviour,

Autocratic Behaviour, Social Support Behaviour, and Rewarding Behaviour) of the leader behaviour in sports. In sport the reliability of the LSS has been tested earlier by Liukkonen (1993) who found acceptable internal reliability for four factors (>.69, in the case of autocratic behaviour, >.30). Also, internal consistency of the LSS scale has been proved with a sample of young Portuguese athletes by Serpa, Pataco and Santos (1991) and with Japanese athletes (Chelladurai et al., 1987). In this study, teachers' leadership style was measured by using two dimensions: social support behaviour and democratic behaviour of original leadership scale (Chelladurai & Saleh, 1980).

The stem for each item was "I consider my physical education teacher". Thus, the pupils' answers covered one of the three aspects by reflecting their perception about their actual physical education teacher. The shortened and adapted Finnish version of the LSS scale included 16 items representing the dimensions of Democratic Behaviour (9 items) and Social Support Behaviour (7 items). Due to the controversial meaning of the Social Support Behaviour item "I consider my physical education teacher invites the pupils home", the item was excluded before the beginning of the intervention. Responses were indicated on the 5-point Likert Scale ranging from 1= strongly disagree to 5= strongly agree.

Explorative factor analysis with principal axis factor analysis and oblimin rotation were applied in order to examine the factor structure of Democratic Behaviour and Social Support separately for baseline and end-measurements. It resulted in three factors for baseline and two factors for end-measurement with eigenvalues higher than one. Six items (2,4,6,8,10,15) failed to load on particular factor at the value of .30 and thus, were deleted. However, due to the factors' high inter-correlation (>.67) only one factor with principal components factor analyses was formulated.

The final one-factor structure included 10 items from both Democratic Behaviour and Social Support Scales with eigenvalues greater than one. Due to identical factor structure for girls and boys separately, the factor structure of the Teacher's Leadership Style Scale included boys and girls together. The item loadings are shown in Table 5.

Table 5. The Factor Loadings of Teacher's Leadership Style Scale and Commonalities (n=333).

Item	Baseline Loadings	h^2	End Loadings	h^2
Teacher's Leadership Style:				
5. Lets the pupils share in decision-making	.76	.58	.74	.54
7. Encourages pupils to make suggestions for...	.74	.55	.72	.52
13. Encourages pupils to make suggestions for..	.72	.52	.75	.57
1. Encourages pupils to make suggestions for...	.71	.51	.71	.50
3. Gets group approval on important matters...	.70	.49	.75	.56
12. Encourages the pupils to confide...	.67	.44	.68	.46
16. Lets the pupils decide on plays...	.60	.36	.70	.49
9. Lets the pupils set their own goals	.58	.34	.58	.33
11. Expresses any affection felt for the pupils...	.57	.33	.63	.40
14. Encourages close and informal relations...	.50	.25	.65	.42
Percent of variance (%)	49.0		52.9	
Eigenvalue	4.9		5.3	

h^2 = commonality

The internal consistency of the Teacher's Leadership Style Scale was satisfactory for boys and girls (Table 6).

Table 6. Cronbach's Alpha Coefficients of the Teacher's Leadership Style Scale Separately for Boys (n= 187) and Girls (n= 146)

	Baseline Measurement		End measurement	
	Boys	Girls	Boys	Girls
Alpha if item deleted				
5. Lets the pupils share in decision-making	.87	.85	.88	.86
7. Encourages pupils to make suggestions for...	.87	.85	.88	.86
13. Encourages pupils to make suggestions for..	.88	.84	.88	.86
1. Encourages pupils to make suggestions for...	.88	.85	.88	.87
3. Gets group approval on important matters...	.88	.85	.88	.87
12. Encourages the pupils to confide...	.88	.85	.88	.88
16. Lets the pupils decide on plays...	.89	.85	.88	.87
9. Lets the pupils set their own goals	.89	.85	.89	.88
11. Expresses any affection felt for the pupils...	.88	.86	.88	.88
14. Encourages close and informal relations...	.89	.86	.89	.88
Alpha for the total scale	**.89**	**.87**	**.89**	**.88**

5.2.2 Equivalency of the experimental and control groups

In order to clarify the gender differences in measured variables as well as equivalency of the experimental and control groups before the intervention begun, one-way analyses of variance were executed. The variables of pre-test represented the dependent variables, whereas the type of class (experimental-control) and gender represented the independent variables. The results (Table 7) show that in baseline measurements girls scored significantly higher than boys in co-operative learning, helping behaviour, and teacher's teaching style whereas ego-climate girls scored lower than boys. No gender differences existed in the effort/improvement variable.

In addition, at the beginning of the intervention the pupils in the experimental schools scored higher in effort/improvement and teacher's leadership style and lower in ego-climate, which complicate the comparison of the intervention effects between the experimental and control schools.

Table 7. The Results of One-way Analyses of Variance Testing the Gender Differences and Differences Between the Experimental and Control Group in the Baseline Measurements (boys n=187; girls n= 146).

	M	SD	F	p
Gender differences				
Effort/Improvement				
Boys	3.74	.68	.02	.886
Girls	3.75	.50		
Ego Climate				
Boys	2.56	.86	4.88	.028*
Girls	2.36	.77		
Co-operative Learning				
Boys	2.84	.83	6.84	.009**
Girls	3.08	.81		
Helping Behaviour				
Boys	3.27	.77	86.74	.000***
Girls	3.98	.63		
Teacher's Teaching Style				
Boys	3.29	.69	7.60	.006**
Girls	3.49			
Experimental-control				
Effort/Improvement				
Experimental	3.87	.53	17.10	.000***
Control	3.60	.66		
Ego climate				
Experimental	2.33	.78	11.06	.001***
Control	2.63	.86		
Co-operative Learning				
Experimental	2.90	.86	.97	.326
Control	2.99	.80		
Helping Behaviour				
Experimental	3.56	.80	.20	.656
Control	3.60	.75		
Teacher's Teaching Style				
Experimental	3.45	.68	4.83	.029*
Control	3.29	.65		

*** significant at the 0.001 level; ** significant at the 0.01 level; * significant at the 0.05 level

6 RESULTS

6.1 Associations Between Motivational Climate, Helping Behaviour and Teacher's Leadership Style

The Pearson product-moment correlations between the variables were examined to clarify the predictive validity of the variables separately for the baseline and end-measurements. The intercorrelations among effort/improvement, helping behaviour, and teacher's teaching style variables are presented in Table 8.

Table 8. Intercorrelations Between the Variables Effort/Improvement, Helping Behaviour, and Teacher's Teaching Style for the Baseline and End-Measurements (n=333).

Variables	1	2	3	4	5
1. Effort/Improvement		-.42**	.46**	.35**	.56**
2. Ego Climate	-.38**		-.17**	-.18*	-.45**
3. Co-operative Leaming	.38**	-.33**		.36**	.39**
4. Helping Behaviour	.24**	-.14**	.27**		.43**
5. Teacher's Teaching Style	.37**	-.40**	.32**	.38**	

Note: End measurements above and baseline measurements below the diagonal
** significant at the 0.01 level; * significant at the 0.05 level

Both in the baseline and end-measurements, the dimensions of effort/improvement and co-operative learning correlated positively whereas ego-climate correlated negatively with these variables. This finding was in accordance with the previous findings (e.g., Duda, 2001; Duda & Whitehead, 1998). In addition, the dimensions of effort/improvement and co-operative learning dimensions correlated positively with helping behaviour and teacher's leadership style whereas ego-climate correlated negatively to these variables. Furthermore, helping behaviour was related positively to teacher's teaching style. The correlations were theoretically reasonable, supporting the predictive validity of the measures. In addition, correlations among the variables were examined separately for boys and girls (Appendices 15 and 16). Although some gender differences in relationship emerged, overall the correlations among the boys and the girls were in the same direction.

6.2 The Effects of the Intervention

The impact of the task-involving climate intervention on outcome variables; effort/improvement, ego-climate, and co-operative learning, helping behaviour, and teacher's teaching style was tested using the 2x2x2 series of multivariate analyses of variance (MANOVA) with treatment (2), experimental-control and gender (2) as a between-subjects factor and time (2) as a repeated measures factor. The time effects (baseline-end-measurement) on groups are expressed as a main effect of TIME, whereas differences in the experimental-control groups when including the main effect of TIME are shown as an interaction effect TIME x GROUP. The comparison of the means of dependent variables indicates the direction of the change. The descriptive statistics for all variables by treatment, gender and time are presented in Appendix 14.

Multivariate test showed that despite the intervention experimental pupils' perceptions of the task-involving climate did not increase compared to the perceptions of the control pupils mF(1,331)=1.39, p=.229. In addition, changes in the students' perceptions of the task-involving motivational climate through the intervention were identical for boys and girls, supporting Hypothesis 2. In order to clarify and visualise single differences in dependent variables through the intervention the tests of univariate analyses were executed. In addition, effect sizes (ES) were also calculated to indicate the meaningfulness of the changes (Thomas & Nelson, 1985; ES<0.2 = small, ES about 0.5 = moderate and ES> 0.8 =large).

These indices were computed on the basis of the measured means of the baseline and end-measures. The results are seen in graphical representations in Figures 4 to 8. In addition, further analyses of MANOVA with the physical education teacher as a between-subjects factor (Appendix 17) deepens the experimental-control design showing the differences between the teachers in dependent variables perceived by their pupils.

Finally, the physical education group as between-subjects factors (Appendix 18) were tested in order to clarify whether the pupils in different physical education groups but taught by the same physical education teacher share the perceptions of their teacher concerning dependent variables.

6.2.1 Effort/Improvement

The univariate tests of MANOVA for the Effort/Improvement Scale (Figure 3) revealed a significant main-effect TIME mF(1,331)=10.67, p=.001 but no interaction effect TIME x GROUP mF(1,331)=0.34, p=.854, showing that by the end of the intervention pupils both in experimental and in control schools perceived their teacher to stress less effort/improvement than in baseline measurement. Furthermore, no gender differences were found in effort/improvement.

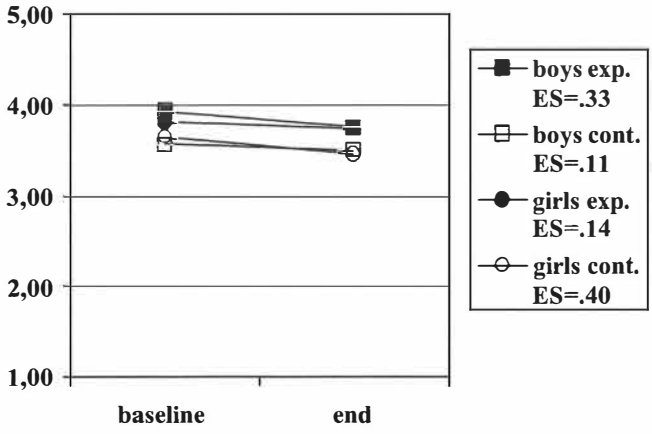

Figure 3. Changes in Pupils' Effort/Improvement Through the Intervention.

6.2.2 Ego Climate

The univariate tests of MANOVA for the Ego-Climate Scale (Figure 4, next page) indicated a non-significant main-effect TIME mF(1,331)=0.51, p=.478 and no interaction effect TIME x GROUP mF(1,331)=.774, p=.380. Thus, differences were found neither in experimental nor control students' perception of ego-climate during the intervention. Furthermore, no gender differences were found in ego-climate. This finding seems reasonable because ego-involving climate was not in focus in this study. Basically, ego-involving climate was measured in order to clarify whether the relationship between the task and ego-involving motivational climates is orthogonal or bipolar. Unfortunately, the relationship

between these two climates remained unclear in this study because task-involving motivational climate did not increase through the intervention.

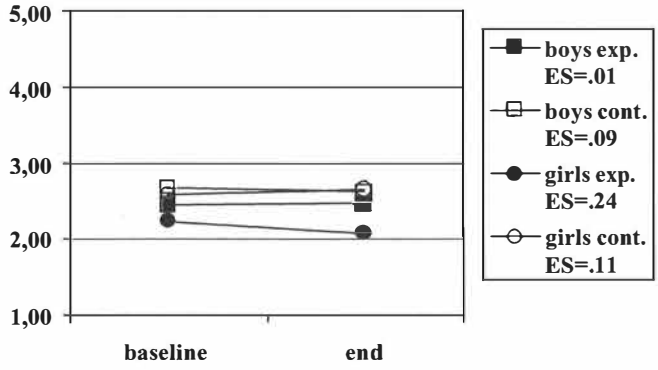

Figure 4. Changes in Ego Climate Through the Intervention.

6.2.3 Co-Operative Learning

The univariate tests of MANOVA for the Co-operative Learning Scale (Figure 5) revealed non significant main-effect TIME mF(1,331)=1.43, p=.233 and no interaction effect TIME x GROUP mF(1,331)=1.30, p=.255, showing that differences in neither experimental nor control pupils' perception of co-operative learning were found during the intervention. Furthermore, no gender differences were found in co-operative learning.

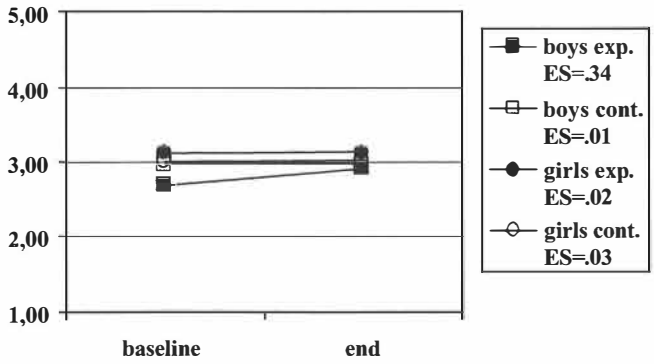

Figure 5. Changes in Co-Operative Learning Through the Intervention.

6.2.4. Helping Behaviour

The univariate tests of MANOVA for the Helping Behaviour Scale (Figure 6) showed non-significant main-effect TIME mF(1,331)=1.43, p=.232 but a significant interaction effect TIME x GROUP mF(1,331)=4.59, p=.033*. The ES pointed out that in practice the changes in both treatments were small (ES< .34). In other words, the intervention increased experimental pupils' helping behaviour slightly. No gender differences were found in helping behaviour. These results support Hypotheses 3 and 4.

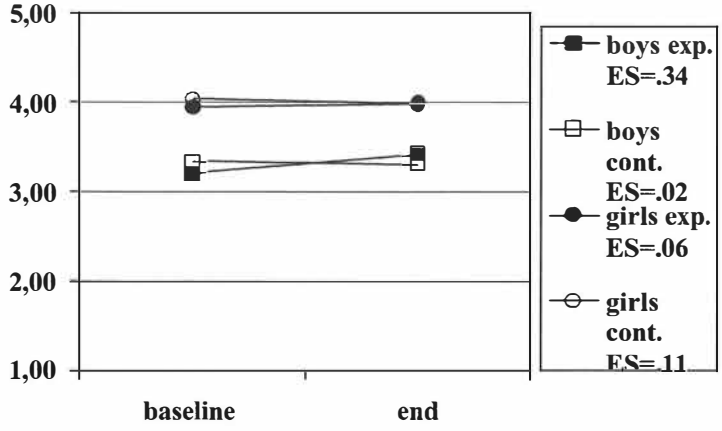

Figure 6. Changes in Helping Behaviour Through the Intervention

6.2.5 Teacher's Leadership Style

The univariate tests of MANOVA for the Teacher's Leadership Style Scale (Figure 7) revealed neither significant main-effect TIME mF (1,331)= .077, p= .380 nor interaction effect TIME x GROUP mF (1,331)= .011, p= .917. The differences in neither experimental nor control pupils' perception of teacher's leadership style were found during the intervention. No gender differences were found in teacher's leadership style.

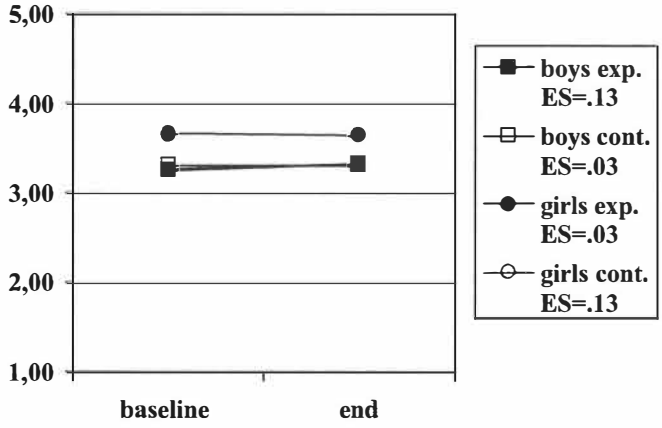

Figure 7. Changes in Teacher's Leadership Style Through the Intervention.

6.3 Effects of the Intervention on the Teacher and Physical Education Group Level

Further analyses in terms of MANOVA with the physical education teacher as a between-subjects (Appendix 17) factor indicated significant main-effect TIME mF(6,327)= 3.76, p=.003** but no interaction effect TIME x TEACHER mF(6,327) =1.22, p=.192, showing that the pupils both in experimental and control schools perceived their teacher stressed the task-involving climate similarly through the intervention. Thus, the intervention did not affect experimental pupils' perceptions of task-involving climate at the physical education teacher level following the results, presented earlier, at the experimental-control level.

Finally, the physical education group as between-subjects factors (Appendix 18) were tested in order to clarify whether the pupils in different physical education groups but taught by the same physical education teacher have similar perceptions of their teacher concerning dependent variables. MANOVA revealed

significant main-effect not only TIME mF(16,317)= 5.19, p=.000*** but also interaction effect TIME x SINGLE GROUP mF(16,317) =1.41, p=.012*.

Univariate tests indicated that changes during the intervention between the physical education groups occurred in ego-climate variable mF(16,317) =1.73, p=.041*. In other words, despite the same physical education teacher both in experimental and control classes, for one physical education group the perception of their ego-climate increased whereas for the other group the perception of ego-climate decreased. To visualize this finding with an example, the results of one experimental teacher's physical education groups (three groups) concerning the ego-climate have been presented in Table 9. Furthermore, pupils' participation percentage in sports club activity in each class was close to each other (varying from 32% to 43%), which decreases the possibility that sport activities outside physical education lessons affected pupils' perception of motivational climate in school physical education lessons. The reasons for the group differences in ego-climate variable will be analysed in the Discussion.

Table 9. Changes in Students' Perceptions of Ego-Involving Motivational Climate Through the Intervention Among Three Physical Education Groups Taught by the Same Teacher

Groups	n	M	SD	F	p
Group 1					
Baseline	16	2.36	.83	5.81	1≠2; .021*
End	16	2.44	.72		
Group 2					
Baseline	22	2.48	.81	9.33	2≠3; .005**
End	22	2.13	.60		
Group 3					
Baseline	12	1.82	.43	1.34	1≠3; .258ns
End	12	2.17	.66		

Note: students' participation percentages in sports club activity in group 1= 32%; group 2 =38%, and group 3= 43%.

** significant at the 0.01 level; * significant at the 0.05 level

7 DISCUSSION

7.1 Main findings

The primary aim of this quasi-experimental, longitudinal intervention study over a time span of one academic year directed toward increasing task-involvement during physical education lessons was to analyse changes in students' perceptions of task-involving motivational climate, teacher's leadership style, and self-reported helping behaviour.

Reliability and validity of the scales were analysed in order to standardise them in physical education lessons. Knowledge on psychometric properties of the six-factor structure of the Finnish version of the Motivational Climate Scale is minimal. In this study, structural validity of the PMCSQ-2 with 29 items was not satisfactory. Thus, the final structure solution of the PMCSQ-2 included three factors with 17 items. Similarly, the final structure solution of the Helping Behaviour and Teacher's Leadership Scale included only one factor instead of two. Otherwise, the correlations among and between the variables indicated that the predictive validity of the scales was reasonable. Furthermore, internal consistency coefficients of the scales were satisfactory showing acceptable reliability of the Finnish version of the scales.

Motivational climate. This study supported previous findings that females have more task-involving perceptions of motivational climate in physical activity settings (Kavussanu & Roberts, 1996) and physical education lessons (Jaakkola & Sepponen, 1997) and less ego-involving perceptions of the motivational climate in physical education lessons (Kavussanu & Roberts, 1996) than males. At the beginning of this intervention, girls perceived that their physical education teacher stressed more co-operative learning and less ego-climate than the boys perceived.

In this study, the intervention did not contribute to experimental pupils' perceptions of effort/improvement, ego-climate, and co-operative learning. The results are contrary to the previous findings of Papaioannou and Digelidis (1998) and Digelidis (2000). Furthermore, unexpectedly experimental pupils' perception

of effort/improvement even decreased during the intervention. This motivational climate intervention affected similarly both genders. Control pupils' perceptions of motivational climate were identical with perceptions of experimental pupils.

Supporting the previous findings, the analyses with the physical education teacher as a between-subjects factor indicated that despite the intervention experimental teachers were perceived to stress task-involving motivational climate similarly at the end of the intervention as in the beginning. It is noteworthy that this finding is inconsistent with the experimental teachers' positive feedback about the utility of intervention in practise (Appendix 1). Indeed, it would be interesting to compare students' perceptions of motivational climate in physical education lessons to teacher's ones from same situation.

Physical education group as a between-subjects factor revealed that there were differences only in pupils' perceptions of the ego-involving climate. More precisely, even if the experimental pupils in different physical education groups were taught by the same teacher some of them perceived that their physical education lessons' ego-involving motivational climate increased whereas the others thought the opposite. The fact that ego-involving climate was not in focus or under control in this study complicates the interpretation of this result. Thus, participants' physical activity background in sports clubs was clarified in order to find out whether some physical education groups were affected by the motivational climate of their sports club. However, the pupils of different physical education groups had almost identical participation profiles in sports club activity showing no support for this assumption. Unfortunately, no comparison could be made with findings at single sport domain level, which might have revealed more about pupils' sport backgrounds.

Probably, some uncontrolled factor(s), for example, pupils' earlier sport experiences, parents' sport history, group dynamic, group cohesion, or pupils' interpersonal relationship affect their perceptions of the ego-involving motivational climate. Thus, it might be too optimistic to assume that intervention could be implemented under total control.

These results might be better understood by keeping in mind the facts that even if this intervention was basically planned and conducted in the same way as previous interventions, a few factors exist which might explain the results of this

intervention. Firstly, the teachers themselves, not the researchers, planned the contents of the practical physical education lessons in our study. The relatively demanding planning process might have affected teachers' willingness, energy or time to regulate their physical education lessons toward task-involvement in practice. Indeed, one of the teacher's suggestions for conducting the intervention in the future was to have several meetings before the academic year started in August. Secondly, based on the achievement goal theory (Nicholls, 1989; Roberts, 2001), if teachers stressed mostly task-involving climate, they were allowed to include also ego-involving teaching practices into their teaching, meaning that maybe this intervention did not concentrate on the creation of task-involving motivational climate as purely as other interventions.

Expectedly, experimental pupils' perceptions of ego-involving climate in their physical education lessons were alike at the end of the intervention as at the beginning of the intervention which still might have affected their perceptions of task involving climate. Unfortunately, this study could not clarify the relationship between these two motivational climates when no changes on climates were found at the end of the intervention. This finding supports Ntoumanis and Biddle's (1999) suggestions about further clarification of the conceptual relationship (orthogonality) between the two climate domains. Furthermore, low correlations between task and ego-climates both in earlier studies (e.g., Goudas & Biddle, 1994) and in this study may suggest that it is possible to report on both types of the climate even if one climate should be dominant.

Thirdly, due to the restricted time schedule of this intervention, the researchers had a relatively short time to introduce the purpose and principles of coming intervention to the teachers, which might have lessened the effectiveness of the intervention. On the other hand, the guiding and methods to the teachers given by the researchers might have been incomplete and inaccurate causing the same effect. In addition, based on the analyses with the physical education teacher as a between-subjects factor, the time period for practical implementation of the intervention might have been too short, meaning that the possible changes in perceptions of motivational climate took place at the teacher level but not yet at the pupil level. Indeed, the whole invention included several gaps each of which affected the results of this study: how the researchers formed a picture of the intervention, what the researchers really did with the teachers, how the teachers really understood the instructions of the intervention, how they implemented the researchers' instructions in practice, and finally how the students perceived

possible changes in physical education lessons made by the teacher. Probably, the changes in the task-involving climate through the intervention would have been more remarkable if the measurements had been directed to the teachers, not the students. In addition, a wider clarification of the teachers' as well as students' background would have facilitated the interpretation of the intervention results. Furthermore, this complicated chain of knowledge is affected by other factors such as school policy or curriculum. At the moment school policy demands that all children are evaluated by grades which are correlated to performance (ego) goals, not mastery (task) goals (Middleton & Midgley, 1997). Creating a task-involving climate in school physical education might be easier without grades.

Additionally, the results above might be explained by the ceiling effect. In this study experimental pupils' perceived their physical education lessons to be highly task-involving already at the beginning of the intervention, which makes it more difficult for teachers to increase it significantly. Specifically, at the beginning of the intervention the pupils of the experimental schools scored higher in effort/improvement and teacher's leadership style and lower in ego-climate. In this study, the way of selection of experimental teachers was based on their voluntaries. Therefore, the teachers who were involved with this intervention might have been more enthusiastic, energetic, and motivated than teachers on average.

Based on the confirmatory factor analysis cultural, contextual or language differences may have caused unacceptable structure validity of the PMCSQ-2. Thus, on the basis of explorative factor analyses, 17 items out of 29 formulated the concept of motivational climate in this study, which may cause problems of capturing the whole motivational climate phenomenon. These 17 items could be the basis for further developing of motivational climate measures in Finland. Teachers might have managed to adapt the TARGET -model to their teaching practices and increased pupils' perceptions of task-involving climate during the intervention but the PMCSQ-2 failed to capture these changes. Furthermore, based on Ntoumanis and Biddle's (1999) suggestion that by adding new items into the PMCSQ-2 scale, it would cover better all the aspects of the TARGET structures, a speculation about these results could be done. Maybe the items concerning student's autonomy or teacher's leadership style should be included into the PMCSQ-2 scale.

In addition, the measures may reflect the changes at the pupils' personality (global) level whereas this intervention was directed at the contextual level. Indeed, during the intervention Jaakkola (2002) found that experimental group's self-determined motivation and task-orientation increased and external regulation and amotivation decreased compared to control groups.

Due to widely tested scales, these dispositional variables may be easier to measure than motivational climate, which still needs conceptual development with valid and reliable measures. On the other hand, Jaakkola (2002) used analyses of covariance in his study whereas this study utilised the Multivariate Analyses of Variance (MANOVA) with repeated measures. Repeated measures (baseline-end-measurement) designs allow the study of a phenomenon across time.

The result that the perceptions of effort/improvement decreased for both experimental and control pupils was interesting. Over the last ten years, a number of studies in Greek physical education (Digelidis & Papaioannou, 1999; Papaioannou, 1997) revealed that, as children grow, they score lower in effort and become less task-involved in their physical education lessons. This finding is parallel with children's decreased participation in physical activity or in sport at the puberty. Telama and Yang (2000) and Yang (1997) indicated that in Finland both children's frequency of leisure time physical activity and participation in sport competitions decrease starting at the age of 12. Competitive nature of sport, critics from other pupils, conflict of interests (general life conflicts) or combination of cognitive development and the level of self-perceptions (Lintunen, 1999) may affect negatively pupils' perceptions of effort/improvement in physical education lessons.

Finally, it is noteworthy that not only the physical education teacher but also the significant others affect creating the process of motivational climate. According to Ames (1992), Nicholls (1989), Roberts (1992), and White et al. (1998), parents, coaches, and teachers mainly create motivational climates by the way of guidance that affects participants in achievement contexts. Children's perceptions of their parents', coaches', and school teachers' motivational patterns contribute to the development of their own motivated behaviours, cognitions, and affects (Eccles & Harold, 1991; Kavussanu & Roberts, 1996). White et al. (1998)

suggest that physical educators' role as a socialising agent has been found to be less important compared to that of coaches and parents.

Team members or classmates together have been found consciously or unconsciously to participate in creating the motivational climate of certain context (Liukkonen, 1998; White et al., 1998). Indeed, children's socialisation with the help of sport within and outside school should be taken into account from broader perspective when planning motivational climate interventions. Duda (2001) brought up also one interesting question concerning the possibility that not everyone in a team or class sees the same picture with respect to the class's motivational climate. This may cause that motivational climate intervention should implement towards individual intervention programmes. In practice, this would complicate the whole planning process of the intervention.

Helping behaviour. As expected, on the basis of literature of gender differences on helping behaviour (e.g., Eisenberg & Fabes, 1998; Liimatainen, 2000), females in our study reported higher levels of helping behaviour at the beginning of the intervention than males. According to our expectations and an earlier study of Papaioannou and Digelidis (1998), the pupils' helping behaviour in this study was supposed to increase modifying their perceptions of motivational climate towards task-involvement. The results showed that intervention increased experimental pupils' helping behaviour for both genders. It might be that teacher's pedagogical solutions during the intervention, such as pupil's self-selected tasks, individualised goals and sharing of responsibility together with the co-operative group works organised by pupils themselves, fostered pupil's helping behaviour.

On the other hand, some uncontrolled factor(s) outside the intervention such as power dynamics of the context in terms of group cohesion or institutional roles may have increased pupils' understanding of their own sources of power, affecting positively their helping behaviour. However, surprisingly only pupils' helping behaviour increased but not their perceptions of co-operative learning even if items concerning both co-operative learning and helping behaviour were very much alike.

Teacher's leadership style. Furthermore, our findings confirmed the notions of Salminen, Liukkonen, and Telama (1992) by showing that at the beginning of the

intervention female teachers' leadership style in terms of social support was higher than male teachers. However, contrary to our expectations, the motivational climate intervention had no effect on teacher's leadership style perceived by boys and girls. New teachings methods and drills which were supposed to increase pupils' autonomy and participation on decision-making process probably demanded extra attention and concentration from the teacher and in this way, decreased the amount of feedback from teacher to pupils or at least pupils may have perceived it this way. In addition, pupils might be afraid of the process where they had to take more responsibility for their own learning while teacher's orders and controlling the way of teaching decreased at the same time.

On the other hand, based on the facts that neither task-involving climate in physical education lessons nor teacher's leadership style increased, teachers' self-enhancing mechanism might prevent them from seeing the shortages in their teaching and thus, changes in teacher's teaching practices were not enough remarkable in order to affect pupils' perceptions about motivational climate or teacher's teaching style. Finally, even if modification of task-involving motivational climate produced no changes on teacher's leadership style in this study, the overlaps between these variables are obvious.

In addition, the perception of teacher's preferred behaviour by gender in terms of democratic behaviour should be examined more widely. Also, cultural or role expectations toward males and females in different physical activity contexts need clarifying. Among male pupils democratic behaviour could be considered parallel with "girls behaviour" and thus, this kind of behaviour must be avoided.

Specially, teachers' leadership style combined with motivational climate intervention is in focus when concentrating on pupils with low perceived competence (Liukkonen, 1998) and/or self-esteem (Smith et al., 1979). According to Liukkonen (1998), young football players with low perceived competence enjoyed more being in task-involving climate in their training than players with high perceived competence. Smith et al. (1979), showed that low self-esteem children responded more positively to coaches trained to be reinforcing and supportive than children with high self-esteem. Therefore in the future, motivational climate interventions, which emphasise social support given by the teacher, could be especially useful for children with low perceived physical competence.

7.2 Methodological Evaluation

Both the strengths as well as the weaknesses of the present study are analysed on the basis of three factors: 1) the nature of the research and data, and statistical analyses used in data analyses, 2) teaching practices and measures selected, and 3) the characteristics of the sample. According to Thomas and Nelson (1996), the present longitudinal quasi-experimental study representing non-equivalent control group design is recommended to be used when groups cannot be randomly formed. Internal validity in this design means controlling all variables when the researcher can eliminate all rival hypotheses as explanations for the observed outcome.

Internal threats may be caused by history, for instance an unintended event during the treatment period, selection bias (if groups not randomly chosen, any variable can explain the treatment effect), and experimental mortality (drop-out effect on treatment group) (Thomas & Nelson, 1996). In this study, the history and experimental mortality was not a concern because the experimental and control groups represented different schools, thus, they were not in contact with each other. In addition, these theories and teaching methods were used for the first time in terms of intervention in Finland. Therefore, it is unlikely that pupils faced these subjects outside the school. Furthermore, there were a relatively small number of drop-outs in the experimental groups, which probably did not affect the final results. On the other hand, the drop-outs before the intervention (6.3%) may affect negatively the results of this intervention via pupils involved with the physical education lessons but not with the intervention.

In this study the selection bias occurs when groups are formed on the basis other than random assignment. This means that all the factors affecting these results were not totally under control. The length of the intervention as well as the selection and meetings with experimental teachers caused this problem. In addition, the selection of the teachers, which was based on recruitment from voluntaries might have caused that at the beginning of the intervention experimental teachers were already more intrinsically motivated towards teaching than the teachers in average. Differences concerning the between-subjects effects (experimental-control) at the beginning of the intervention supported this assumption.

In this study, three external validity threats existed: interactive effects of testing (pre-test affects post-test), reactive effects of experimental arrangements (e.g., subjects performance change when attention is paid), and the interaction of selection biases and the experimental group (characteristics of treatment group) (Thomas & Nelson, 1996). Firstly, only cognitive, not physical aspects were measured twice a year and pupils were unaware of the results of the pre-test, which impeded the interactive effects of testing.

Secondly, despite the fact that experimental pupils were not informed about the intervention, the teacher's changed but unintentional attention towards them might have affected their responses in the post-tests. Thirdly, problems on the characteristics of the treatment groups occurred when all the experimental pupils were practically from the same city which may have a local genuine subculture of sport. On the other hand, these intervention schools represent normal Finnish schools and the teaching methods could be used in any other school in Finland. Thus, this intervention could be implemented probably with same results in any other ninth grade classes.

The longitudinal nature of the data also guided the choice of statistical methods employed. Based on Tabachnick and Fidell's (1996) suggestions Multivariate Analyses of Variance (MANOVA) with repeated measures (baseline-end) were chosen as a major statistical method in order to find out the interaction effects of time and group, the between-subjects effects at the beginning of the intervention, and gender differences.

Furthermore, based on Papaioannou's (1999) suggestion, differences between the experimental and control groups were examined using the student as a unit of analyses in this study. It was expected that when investigating cognitive variables at the contextual level of generality, there were no single event at the class level that had an effect on all student perceptions. In addition, the class still consists of individuals and each individual, not the class, perceives, for example, the motivational climate differently.

An additional methodological issue concerns the teaching methods and measures selected. Based on the teachers' diaries and conversations with them, the teaching methods of our intervention, for example goal setting, self-evaluations, increasing autonomy, and thematic implementation were evaluated useful and suitable for the 15-year-old pupils. Specially, the thematic implementation,

which allowed the teacher to concentrate on one subject at a time, and goal-setting which increased pupils' autonomy and participation in decision-making was perceived as an effective tool in practice. In order to strengthen the effect of intervention on pupils, more accurately prepared lesson plans could have been given to the teachers.

In addition, according to the teachers, the intervention included a lot of new theories and teaching methods, which made the implementing of the intervention laborious. Probably concentrating on a few or only one thing during the intervention would have yielded better results. Perhaps modifying of the task-structure, grouping, or authority itself would have been enough to increase pupils' perceptions of task-involving motivational climate. Supporting this assumption, Papaioannou and Kouli (1999) manipulated physical education lessons by changing only the task structure. They found that in the lesson comprised of task-involving climate the students had a higher state of self-confidence, lower somatic anxiety, and perceived higher task-involving and lower ego-involving climate compared to the pupils in ego-involving climate. However, due to lack of observation during the lessons, the evaluation of the teacher's teaching methods is not accurate and objective

Furthermore, these weaknesses in this longitudinal study put in jeopardy the establishment of causal-effect, which means, for example, the existence of the relation between the presumed cause and effect (teaching methods and results) and the exclusion of other competing explanations for the results (Duncan, Duncan, Strycker, Li & Alpert, 1999). In addition, according to Thomas and Nelson (1996), researcher's theoretical beliefs, study design, and use of statistical analyses are essential factors in establishing causal-effect, which can be best drawn on the basis of longitudinal, experimental data. Still, these results have to be interpreted with caution as always in the case of experimental studies conducted with the human beings (Farrington, 1992).

As for the measures selected in this intervention, the difficulties in Finland with the PMCSQ-2 scale may have been caused by the facts that the developing of the 29-item Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Walling et al., 1993) has been done mostly in English-speaking countries (Duda & Whitehead, 1998). Secondly, this measure was developed and used in different sport contexts but not extensively in a physical education class context.

Thirdly, the research sample consisted of children, when the PMCSQ-2 is mainly validated with adults. However, for the first time in Finland the confirmatory factor analysis was used to test more stringently the validity of the PMCSQ-2. Overall, the data provided weak support for the structure of two higher-order scales each with three sub-scales. This result was in line with the previous findings with the sample of female volleyball players and volleyball and basketball players (Newton et al., 2000). To validate the measure further, this multi-faced structure of motivational climate should be taken into account by adding more items from classroom-specific questionnaires, which could also increase the internal consistency. In addition, studies should examine the relationship between overt coaching behaviour and responses to the PMCSQ-2 and clarify how the perceptions of the motivational climate interact with, are impacted by, and influence dispositional goal orientations over time (Ntoumanis & Biddle, 1998). Due to the results of confirmatory factor analyses, the explorative factor analyses for the PMCSQ-2 were conducted. The final three-factor solutions with 17 items differentiated slightly from the previous findings in Finland, which used two-factor solutions suggesting task and ego-climate (Kokkonen & Pöllänen, 1998, Liukkonen, 1998). However, in this study, the percentage of variance explained by the three factors (51.6% and 53.6%) is a concern when interpreting the results.

In this study, the Helping Behaviour Scale with nine items in two factors (Willingness to Help and Unselfishness) indicated low structure validity. After deleting two items, which were presented in negative directions in the questionnaires and formulating only one-factor solutions instead of two, the satisfactory structure validity and internal consistency were accomplished. These results are in accordance with previous findings (Kahila, 1993; Liimatainen, 2000) suggesting high correlations between the sub-scales of helping behaviour. These sub-scales could be connected and formulate only one scale measuring a common tendency to help. In the future, more items should be added to the dimensions and at least in case of young children all items should be presented in the same direction.

Teacher's Leadership Style was measured by using two adapted dimensions (Social Support and Democratic Behaviour) of the original Leadership Scale for Sport (Chelladurai & Saleh, 1980). The selection of the two dimensions was based on the strong overlap with the TARGET-structures. Supporting

Liukkonen's (1993) findings on the weak structure validity of the scale, the dimensions were also highly intercorrelated in this study showing dependent relations between the dimensions. After deleting six items and formulating only one factor structure, the satisfactory structure validity and internal consistency were accomplished. Limitations concerning the results could be presented based on the fact that one aspect, actual behaviour with only two dimensions of the coaching behaviour was measured. In the future, required and preferred coaching behaviour could be measured with all five dimensions. Chelladurai and Riemer (1998) in their extensive review have presented several suggestions for developing the LSS-scale further. A better understanding of the relationship between the teaching methods and measures would have been reached by including more objective (e.g., observing) and qualitative (e.g., interviews) methods into this study and using measures also at the teacher level, which would have given a possibility to compare teachers' perceptions about the intervention with the pupils'.

Finally, the characteristics of the sample in this study limited the generalization of the findings. One problem with this sample was the large number of drop-outs in the control schools' students. Due to these drop-outs, all the control girls represented the same school. In addition, those pupils in the experimental schools who participated in physical education lessons but not the intervention may affect other experimental students' perception of the motivational climate in physical education lessons.

The other problem was that the experimental teachers for intervention were recruited from voluntaries. The teachers involved in this intervention might have been more interested and motivated to improve their teaching methods than physical education teachers on average. It is possible that modifying the school lessons toward task-involving climate are even more laborious if the teacher has no motivation on it. Furthermore, the experimental pupils and control pupils represented different localities, each of which may have a unique subculture of sport or physical education. Therefore, the generalization of these results must be done with caution.

This intervention was implemented with the 9^{th} grade pupils who are at the age of 15. These pupils were assumed to be capable of cognitively and critically analysing their own thinking and behaviour, which was the basis for most of the

teaching methods used in this intervention. On the other hand, it would have been interesting to make intervention with younger children, for example children in the 7th grade with a follow-up study, which would have shown also more about the stability of changes. Pupils in this intervention finished their comprehensive school causing the rejection of a follow-up study. An advantage of the present study was that both the genders were involved in the study, which is essential in order to fully understand the impact of sex on perceptions of motivational climate. It was noteworthy that the profiles in measured variables were similar to both the genders through the intervention.

Despite a few flaws presented earlier in this section, this study contributes to the literature in several important ways. First, this was one of the first studies which have been carried out by using an adapted version of the dynamic model of motivation (Roberts, 1992) in line with the TARGET-model structures (Epstein, 1989) in longitudinal design. Second, it confirmed a number of earlier findings, and offered new information about the problems concerning the implementation of the motivational climate intervention in real world setting.

Third, for the first time, instead of making all the decisions concerning the practical implementation of the intervention by the researchers, an attempt was made to increase the pupils' perceptions of task-involving climate in their physical education lessons through teachers' guiding and counselling. Fourth, the present study produced valuable information, as well as raised questions, concerning sex differences in measured variables. Fifth, the modified Finnish version of the PMCSQ-2 appeared to be a promising tool for studying perceptions of motivational climate in school physical education context.

7.3 Future Directions

The present study focused on regulating the task-involving climate (e.g., Nicholls, 1989; Roberts, 1992) of physical education lessons. However, at the end of the intervention the pupils did not perceive increased task-involving climate in their physical education lessons, which failed to be in accord with the earlier studies (Digelidis, 2000; Papaioannou & Digelidis, 1998). Therefore, in the future, Finnish physical education teachers will need prepared teaching materials at the beginning of the intervention. In addition, maybe a restricted

number of the TARGET-structures would make a more effective intervention by enabling the concentration on certain areas. Furthermore, using the observation methods gives more information about the teacher's role in intervention, or the whole intervention could concentrate on teachers instead of pupils.

In the future there is a need for longitudinal interventions, which, from motivational point of view capture objectively the way of action in terms of teaching methods or pupils' activity in physical education lessons. One way to confirm that is to formulate an intervention on the basis of random sample and concentrate on certain, restricted number of controllable variables, which would make drawing conclusions and possible causal-effect easier.

Furthermore, not only the self-report questionnaires of the pupils but also measures of significant others such as parents, teachers, and coaches of the sports club should be included in the motivational climate research. It is not only the teacher or researcher who affects children's behaviour but also the micro, meso, exo, and macro systems (Bronfenbrenner, 1980) around the children including peer relations, parents, and school policy. In order to find out the stability of possible changes on pupils' cognitive, behavioural, or affective outcomes, the follow-up measures should also be implemented six months or one year after the end of the intervention. Furthermore, domain-specific instruments should be developed in order to capture the motivational climate in different achievement settings such as sport, school, or workplace. The developing process based on statistical methods could use qualitative methods, such as interviews, when trying to improve the measures and concept of motivational climate.

More widely, it has been suggested that motivational climate should be examined in different hierarchical levels, both at situational, contextual, and global levels (Ntoumanis & Biddle, 1999; Papaioannou, 1999; Vallerand, 2001). The clarification of the interrelationship of different levels would offer a more holistic picture of the effects of motivation on individuals. Furthermore, the perceived competence and autonomy have been the most common cornerstones of the intrinsic motivational theories whereas, due to lack of research, the role of social relatedness in these theories is unclear. Similarly, when speaking of the motivation from social cognitive point of view, the third component labelled as emotional arousal, which is a source of evaluation in achievement striving should be considered when planning further research. From the viewpoint of practical

implications, these findings could be used when planning the physical education teachers' as well as other teachers' further education.

7.4 Conclusions

To sum up, the following conclusions can be drawn from the study:

1. Experimental students' and control students' perceptions of task-involving motivational climate in terms of effort/improvement slightly decreased through the intervention.

2. Experimental students' and control students' perceptions of task-involving motivational climate in terms of ego-involving motivational climate did not change through the intervention.

3. Experimental students' and control students' perceptions of task-involving climate in terms of co-operative learning did not change through the intervention.

4. Experimental students' and control students' perceptions of teacher's leadership did not change through the intervention.

5. Experimental students and control students increased their self-reported helping behaviour through the intervention.

6. Effects of the intervention at the teacher and physical education group level followed mainly the findings in the experimental-control design. One exception was revealed in group-level comparison, as students from different classes but taught by the same teacher perceived their ego-involving motivational climate differently.

7. The analyses of the original scales used to measure students' perceptions of motivational climate, teachers' leadership styles and self-reported helping behaviour need further developing in the future.

8. In practice, it seems that affecting on student's motivational factors through the teachers consultation needs relatively long time period.

9. Intervention produced pedagogical means and practices, which can emphasise task-involvement in physical education lessons.

YHTEENVETO

Motivaatio on yksi tutkituimmista kohteista liikuntapsykologiassa. Nykypäivän motivaatiotutkimuksessa syitä ihmisen tavoitehakuiseen liikkumiseen tai liikkumattomuuteen perustellaan sosiaalis-kognitiivisesta näkökulmasta. Tällöin ihminen nähdään aktiivisena osallistujana, jonka liikuntamotivaatio syntyy hänen sisäisten tekijöidensä (ajatukset, arvot ja uskomukset) sekä sosiaalisten tekijöiden (vuorovaikutustilanteet, oppimisympäristö) yhteisvaikutuksesta. Tutkittaessa oppilaiden motivaatiota koululiikunnassa tai kokemuksia liikuntatuntien motivaatioilmastosta yksi käytetyimmistä sosiaalis-kognitiivisista teorioista lienee tavoiteorientaatioteoria.

Tavoiteorientaatiotutkimuksen alueella useimmat tutkimukset ovat olleet poikkileikkaustutkimuksia, jolloin eri opetusmenetelmien vaikutusta oppilaiden liikuntamotivaatioon on ollut vaikea selvittää. Lisäksi tutkimusten käytännön suunnittelutyö ja toteutus on suoritettu pitkälti tutkijajohtoisesti, mikä vähentää oppilaiden omaa aktiivisuutta opetusta koskevissa päätöksentekoprosesseissa. Mainittu tutkijajohtoisuus, keskittyminen vain tiettyihin liikuntalajeihin motivaatiota mitattaessa sekä tehtäväsuuntautuneen opetusmateriaalin puute ovat vaikeuttaneet tutkimusten soveltamista käytännön opetustyöhön.

Tämän kvasikokeellisen interventiotutkimuksen lähtökohtana oli tutkia oppilaiden motivaatiotekijöiden kehittymistä yhden lukuvuoden mittaisen liikunnanopettajien täydennyskoulutuksen seurauksena. Opettajien täydennyskoulutuksen tarkoituksena oli kehittää ohjelma, jonka avulla opettajat voisivat lisätä tehtäväsuuntautunutta motivaatioilmastoa omassa opetuksessaan. Tällöin opettaja korostaisi oppilaan omaa kehittymistä, yrittämistä ja yhteistyötä omassa opetuksessaan, minkä tulisi näkyä oppilaiden lisääntyneenä motivaationa koululiikunnassa.

Tutkimuksen yhdeksäsluokkalaiset osallistujat olivat 15-vuotiaita tyttöjä ja poikia, joille kuuluu osallistuminen pakollisille liikuntatunneille. Tutkimusryhmä koostui 178 oppilaasta ja heidän neljästä opettajastaan, jotka osallistuivat viikoittaisiin konsultaatiopalavereihin intervention aikana. Vertailuryhmänä oli 155 oppilasta ja heidän 3 opettajaansa, jotka eivät saaneet konsultaatiota intervention aikana. Konsultaatiopalavereissa käytiin lävitse seuraavia tehtäväsuuntautuneeseen motivaatioilmastoon liittyviä opetusmenetelmiä:

opettajien omien opetusmenetelmien kehittämistä tavoitteenasettelu- ja observointilomakkeiden avulla, oppilaiden autonomian lisäystä antamalla oppilaiden vaikuttaa liikunnanopetusta koskeviin päätöksentekoprosesseihin, oppilaiden omakohtaisten tavoitteenasettelu- ja itsearviointiohjelmien läpikäymistä sekä teemakohtaista opetusta, jossa painotetaan määrättyä teemaa tietty aika. Tässä tutkimuksessa teemoja olivat jokaisen oppilaan tärkeä rooli liikuntatunnilla, oppilaiden henkilökohtainen kehittyminen ja oppilaiden yhteistoiminnan lisääminen.

Tutkimustulokset osoittivat, että intervention aikana tutkimuskoulujen oppilaiden kokemukset tehtäväsuuntautuneesta motivaatioilmastosta eivät eronneet vertailukoulujen oppilaiden kokemuksista. Vastoin odotuksia tutkimuskoulujen- sekä vertailukoulujen oppilaat kokivat yhdellä alaskaalalla (yrittäminen/kehittyminen) mitattuna tehtäväsuuntautuneen motivaatioilmaston hieman laskeneen. Sitä vastoin tutkimuskoulujen oppilaat kokivat auttamiskäyttäytymisensä lisääntyneen liikuntatunneilla verrattuna vertailukoulujen oppilaisiin. Opettajan johtamiskäyttäytymisessä tutkimuskoulujen oppilaat eivät havainneet muutosta intervention aikana. Sukupuolten välisiä eroja mitatuissa muuttujissa ei ilmennyt. Tulosten analysointi suoritettiin lisäksi erikseen kunkin opettajan kohdalla sekä yksittäisen liikuntaryhmän tasolla. Saadut tulokset tukivat aiempia koe-kontrolli-asetelmalla saatuja tuloksia. Poikkeuksena olivat erot kilpailusuuntautuneessa motivaatioilmastossa yksittäisten liikuntaryhmien tasolla. Tämä tarkoittaa, että oppilaat, jotka toimivat eri liikuntaryhmissä mutta saman liikunnanopettajan alaisuudessa, kokivat kilpailusuuntautuneen motivaatioilmaston erilailla.

Tuloksia tulkittaessa on syytä ottaa huomioon konfirmatorisen sekä exploratiivisten faktorianalyysien aiheuttamat muutokset alkuperäismittareiden kysymyksien lukumäärässä. Lyhentyneet mittarit vaikeuttavat kyseisen ilmiön mittaamista ja saattavat vääristää tehtyjä tulkintoja. Myös satunnaistamisen puuttuminen valittaessa tutkimuksen koe- ja kontrolliryhmiä mahdollistaa kontrolloimattomien tekijöiden vaikutuksen tutkimustuloksiin. Lisäksi observoinnin puuttuminen tutkimuksesta vaikeuttaa opettajien opetuskäytäntöjen kuvaamista.

Jatkossa tutkimuksen mittareita olisi kehitettävä kyseiseen kontekstiin eli koululiikuntaan paremmin sopiviksi. Pedagogisten menetelmien vaikutus saattaisi tehostua, mikäli interventiot jatkossa kestäisivät useamman lukuvuoden

ja sisältäisivät pysyvyysmittauksia interventioiden loputtua. Myös oppilaiden taustatekijät ja niiden vaikutukset motivaatioilmaston kokemiseen vaativat jatkossa laajempaa huomiota.

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APPENDICES

Appendix 1. Description of the motivational climate intervention in school physical education.

1. The beginning of the project

The idea of planning the motivational climate intervention was started at the end of 1998. PhD Jarmo Liukkonen and Professor Risto Telama started the project based on the earlier motivational research in the Department of Physical Education at the University of Jyväskylä. Liukkonen (1998) implemented his dissertation on enjoyment in youth sports. He used a goal-perspectives' approach by investigating young soccer players. In addition, during the years 1996-1999 Liukkonen and Telama supervised several master's theses concerning motivation area (e.g., Jaakkola & Sepponen, 1997; Kokkonen & Pöllänen, 1998). However, these studies in the area were cross-sectional and some of them were conducted in sports context. Due to this, the next step was to conduct a longitudinal study to develop and test teaching methods in the Finnish physical education context. In the beginning of 1999 Jaakkola and Kokkonen entered the project in order to conduct their PhDs in this area. At this phase they took the main responsibility for running the study. The aim of the study was to find out if motivationally relevant, positive cognitive, affective, and behavioural changes among pupils can be reached as a result of highly task-involving motivational climate in physical education lessons which were implemented through teachers' education and counselling. Additionally, changes in motivational climate and teaching practices in school PE classes as a result of the intervention were analysed.

2. The planning phase

Jaakkola and Kokkonen started to plan the intervention programme in the beginning of 1999. The starting point was to develop teaching methods and devices for practise based on contemporary motivation theories and motivational climate literature. In sports psychology and pedagogy area only a little knowledge exists on practical issues which a teacher could utilise when planning the learning environment of an action. Another important issue in the planning phase was the duration of the intervention. Previous intervention studies in motivational climate area had lasted only a few lessons or weeks. Therefore it was justifiable to design a longer intervention which could provide more accurate knowledge of the usefulness of planned teaching methods and devices.

These justifications are also noticed by motivational climate researchers and they have suggested developing such methods and devices and testing them in longitudinal design (e.g., Treasure, 2001). Jaakkola and Kokkonen planned teaching methods and devices with consultations with colleagues in the Department of Physical Education, foreign researchers and some physical education teachers in Finland.

Another important part of the planning phase was the selection of appropriate research methods and scales. The main purpose was to gather data by using quantitative methods. A literature search was done in order to find out what kind of questionnaires had been used in motivation and motivational climate area. Based on the analysed psychometric properties of the scales of earlier studies, the best measures were selected for the pilot study. In addition, foreign experts of the area gave consultation about useful scales. After that selection, a pilot study was conducted in order to find out whether the psychometric properties of the selected scales were satisfactory in the Finnish physical education context. The pilot study was implemented in April 1999. The scales were responded by 797 ninth-grade students. After confirming that the selected scales were appropriate in the Finnish physical education context, the final decision about the used measures was made. The chosen scales were the Finnish versions of the Sport Motivation Scale (Pelletier, Fortier, Vallerand, Tuson, Briere & Blais, 1995), the Physical Self-Perception Profile (PSPP)(Fox, 1990; Fox & Corbin, 1989), the Perception of Success Questionnaire (POSQ; Roberts, Treasure & Balague, 1998), the Perceived Motivational Climate Questionnaire in Sport-2 (Walling, Duda & Chi, 1993), the modified Finnish version from the Helping Behaviour Scale (Severy, 1975), the modified Finnish version from the Leadership Scale for Sports (Chelladurai & Saleh, 1978). All measures were translated into Finnish by a panel of experts and later back into English by a native British translator. The re-translated English version was compared to the original version for consistency and those items which might have had more than one possible meanings in Finnish were discussed by the panel of experts in order to redraft them as accurately as possible to capture the right meaning of each item.

The second quantitative research method was systematic observation (Appendix 3). This was divided into different parts of teachers' behaviours which they could implement in task or ego-involving way. These parts of the scale were adopted from the TARGET-model (Epstein, 1989) and the existing literature of the motivational climate (Duda & Whitehead, 1998). The observational system was developed and tested during the pilot study in spring 1999 and it was presented in FEPSAC conference in Prague (Jaakkola, Pakkala, Piirainen, Liukkonen, Kokkonen & Telama, 1999).

The secondary methods category was qualitative methods. These were incorporated to strengthen quantitative results. Structured thematic students interviews, systematic observation of motivational climate by video recording, observers' subjective total assessment of the lessons, and teachers' diary were selected as qualitative methods. The

purpose of the structured thematic students interviews was to collect students' individual perceptions of motivational climate of their physical education class.

Observers' subjective total assessment of the lessons was linked to motivational climate observation system. The scale was also developed based on the TARGET-model (Epstein, 1989) and the existing literature of the motivational climate. The purpose of the Observers' Subjective Total Assessment Scale was to get objective opinion about video recorded class. Two independent observers were supposed to fill in the scale after each video-recorded physical education lesson. The scale was tested during the pilot study in Spring 1999.

The plan included teachers keeping a weekly filled diary of their teaching practices and feelings. This was supposed to help the researchers to control what had happened in each physical education lesson class. The teachers were supposed to write down used drills, games and practices. In addition, teachers' emotions were to be examined during the year through the diaries.

Research design. The next step in the planning process was to establish an appropriate research design. Experimental-control design was chosen in order to analyse the effect of the intervention by comparing experimental and control groups after intervention. Quasi-experimental design was chosen because it was not possible to randomise groups into experimental and control groups. Meetings with the experimental teachers were planned to be arranged weekly. Therefore, it was important that the experimental schools came from Jyväskylä, or at least, very close to it. Secondly, it was imperative that the possibility of the students in the experimental group to communicate with the students in the control group was prevented. Students were selected into the experimental group only from Jyväskylä whereas students in experimental groups were from other parts of Central Finland and from Southern Finland. The control schools were selected by randomising five teachers out of approximately 20. The selection criteria were teachers' similar teaching experience compared to experimental teachers and approximately the same age. In addition, it was confirmed that neither experimental nor control teachers were familiar with motivational climate area.

The teachers of the experimental and control groups were initially recruited via the first contact made by phone in order to find out whether they were interested in participating in the intervention. Control teachers' interest of participation in the intervention was clarified by phone. After confirming teachers' interest, the first meeting with the experimental teachers was arranged separately in each experimental school. The purpose of this meeting was to inform the teachers about the nature and demands of intervention. After the meeting the teachers were asked to consider participating in the intervention during the summer. The final commitment was asked by the beginning of the academic year in August 1999. Five experimental teachers started the intervention programme. One teacher, however, withdrew from participation in December. Four teachers, two male and two female, therefore, participated in the intervention. Three out

of four teachers were approximately 40 years old with a 15-years' experience as a physical education teacher. One of the teachers was 60 years old, with only two more years left before retirement.

An important issue in the planning phase was to decide the subjects' (students') class level. The ninth grade was selected in order to confirm that the subjects had the same physical education teacher during their eighth grade. In addition, the experimental teachers suggested ninth-grade students should be chosen because intensive intervention would be easier to implement during the last year of the secondary school. The teachers felt that during the seventh and eight grade, physical education is more scheduled and include a lot of compulsory factors, such as sports and tests, and it would have been difficult to include intervention in those class levels. The teachers also assumed the ninth grade students to be more mature to take responsibility for intervention comparing to the seventh and eight-grade students.

The participants of the study were 190 Finnish ninth-grade (15-year-old) students, 96 girls and 94 boys, who were involved in 9 classes taught by four physical education teachers. The control groups consisted of 271 pupils representing 13 classes taught by six teachers. In the final analyses, 178 students from the experimental schools and 259 students from the control schools participated in the study.

The last step in the planning phase was to accurately design all intervention meetings with the teachers. Jaakkola and Kokkonen planned the contents of each meeting including used methods, devices, and practices. This was done during the summer and early autumn of 1999.

3. The nature of intervention

The purpose of the intervention was to affect motivational climate through teacher consultation and education. In addition, it was studied whether possible changes in the motivational climate of physical education lessons affected students' motivationally relevant cognitive, affective, and behavioural responses. The framework of the study is presented in Figure 1. The intervention consisted of two different levels. The first level was consultation between researchers and teachers and the second was the interaction between teachers and students. The researchers were able to control the first level of the intervention whereas the controllability of the second level was dependent on the feedback and notes given by the teachers. Thus, the researchers did not have an objective general view about the interaction between teacher and students during intervention.

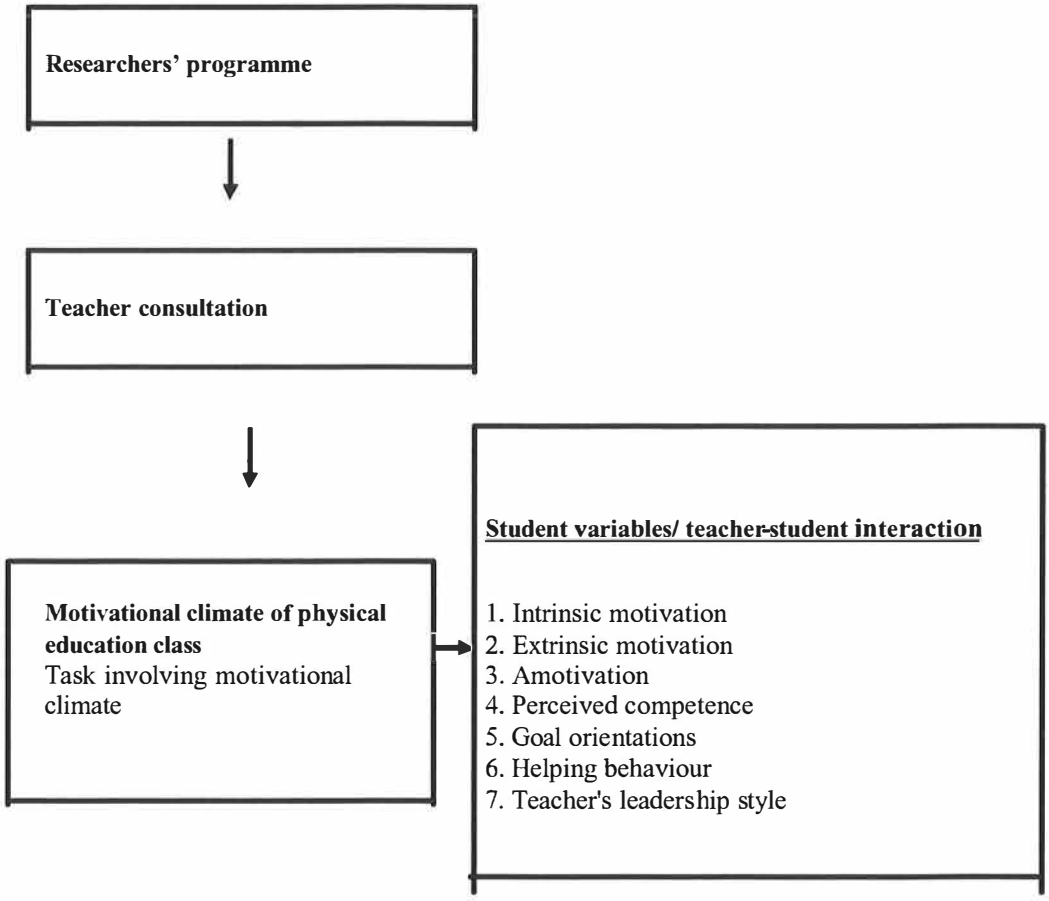

Figure 1. Framework of the Study

Timo Jaakkola's and Juha Kokkonen's doctoral theses are based on the present intervention study. Jaakkola concentrated on the students' intrinsic and extrinsic motivation and amotivation, goal orientation as well as their perceived physical competence. Theoretically his standpoint reflects both the knowledge of personality psychology and didactics. Kokkonen's area of this study was the motivational climate of an action, helping behaviour and teachers leadership style. His theoretical viewpoint evolves from social-psychological aspects of physical education. The intervention was planned and implemented together. After end measurements the researchers started independent writing processes.

4. Measurement

The baseline measurements were implemented in September 1999, and the end-measurements at the end of April 2000. Originally, the third measurement was supposed to be implemented in January 2000. However, a decision was made to give up the third measurement in order to avoid students' concentration problems in filling in the questionnaires in end-measurement. The students responded to a set of questionnaires voluntarily and unanimously under supervision of their teacher in two consecutive lessons. The participants were told to ask for help if confused concerning either the instructions or the clarity of a particular item. They were also told that if they were unable to finish the inventory they could drop out at any time without incurring a penalty. The pupils were informed about the data collection process, but not about the intervention. They were only told that their teacher is participating in further education. The intention was to videotape six to twelve physical education lessons from each experimental teacher during the intervention. All recorded lessons were supposed to be on the same sport, which would have made it possible to compare what happened in the observable motivational climate during the intervention. In addition, the observers' subjective total assessment scale was fulfilled by two independent observers after each videotaped lesson. These independent observers were master's thesis-students.

However, the teachers were able to arrange only one lesson in the autumn and one in the spring for videotaping. Therefore the video analyses and observers' subjective total assessment of the motivational climate were rejected from the study. However, one or two physical education lessons were videotaped from each experimental teacher in September 1999. All experimental teachers used these videos to analyse their own teaching behaviour from the motivational climate perspective.

Structured thematic students interviews were implement during the intervention. Four students from each experimental school were selected to the interview. The selection was based on students' gender and perceived competence towards physical education. Based on the ratings of the PSPP scale, one boy and one girl of low perceived

competence and one boy and one girl of high perceived competence were selected. The students were interviewed on their perceptions on motivational climate during the intervention. Altogether, the same students were interviewed four times. The first interview was arranged in September 1999 and the last in April 2000. The analysis of this interview data has been reported in a separate publication (Koskimies & Mäkynen, 2000). The schedule of the measurements of the intervention is presented in Figure 2 of this description.

September 1999	**Baseline measurement:** Quantitative questionnaires: POSQ, SMS, PSPP, PMCSQ-2, Helping behaviour, LSS - 2 videotaped lessons/class - Subjective assessment of two observers about climate
April 2000	**End measurements:** Quantitative questionnaires: POSQ, SMS, PSPP, PMCSQ-2, Helping behaviour, LSS 2 videotaped lessons/class, Subjective assessment of two observers about climate

Figure 2. The schedule of the Measurements of the Intervention

5. Contents of intervention meetings

In the next section, the description of all consultation meetings between the researchers and experimental teachers are presented. The goals of each meeting delivered pedagogical means and devices, and the course of actions is shown in chronological order. In addition, few lessons run by the teachers have been described in order to clarify how the intervention between the researchers and teachers transferred into teacher-student level. The consultation meetings were all face-to-face meetings between experimental teachers and both the researchers. The researchers went to the experimental schools to run the meetings. The meetings were arranged in a quiet place in order to avoid interruptions.

The intervention was divided into two distinct phases. In the autumn, the purpose was to inform the teachers about the basic concepts, such as motivational climate, goal orientations, intrinsic versus extrinsic motivation, perceived competence, for instance. The first meetings in the autumn were mainly theoretical in focus and design. The purpose was to help the teachers to understand the basic concepts of motivational climate and to guide them in learning the recognition of these concepts in their teaching (e.g., task and ego-oriented pupils, task and ego-involving climates).

5.1 Phase 1 of the intervention (8 meetings from week 40 to week 50)

The first meeting (week 40) had four goals:
1) To clarify the concept of goal-orientation and its' development. The role of the family, school, peers, for instance, in goal-orientations development process were explained.
2) To clarify the concept of task and ego-involving motivational climate (Epstein, 1989). In addition, the teachers were taught how to create task-involving motivational climate according to Epstein (1989). By the examples, the teachers were concretised how different TARGET-dimensions illustrate task-involving motivational climate.
3) To complete a diary. The teachers were taught how to use a diary weekly. They were asked to write down all the drills, which they perceived to be a part of the creating motivational climate in their physical education lessons. Complementing the diary included also teachers' perceived positive (happiness, satisfaction, etc.) as well as negative (exhaustion, anxiety, etc.) emotions caused by the intervention. In addition, the teachers were asked to write down all important and relevant details concerning the intervention. The completion of the diary was recommendable but not obligatory.
4) To distribute a folder including selected Finnish articles on motivational climate, goal-orientation, intrinsic motivation, as well as chapters from books concerning helping behaviour, co-operation and self-esteem. They were distributed in a folder with theoretical, methodological, and practical issues they would need to address during the year (Appendix 2). The folder gave the teachers a general view about the whole intervention year.

The second meeting (week 41) had three goals:
1) To clarify the theory and concept of exercise motivation to teachers. The role of intrinsic motivation factors, autonomy, perceived competence, social relatedness, was explained and illustrated to the teachers by theoretical and practical examples (Deci & Ryan, 1985).
2) To clarify the concept of enjoyment and anxiety as a result of motivational climate.
3) To clarify the associations between goal orientation, motivational climate, exercise motivation, enjoyment, and anxiety.

The third meeting (week 42) had two goals:
1) To focus on going through all the previous themes from the first meeting to this meeting. The teachers were helped if they were perceived these variables confusing.
2) To introduce motivational climate observation system (Appendix 3) according to which they analysed their feedback behaviour in physical education lessons. The teachers were given a task to analyse their own feedback behaviour by using their videotaped lessons by the next meeting.

The fourth meeting (week 44) had three goals:
1) To go through the task about teachers' own feedback behaviour in physical education lessons. The teachers were free to explain their perceptions of their own feedback behaviour.
2) To introduce systematic goal-setting programme concerning their teaching (Appendix 4). The principles of the goal-setting programme were explained and the teachers were free to choose the teaching skills they wanted to develop. The purpose of the teachers' goal-setting programme was to learn to analyse and develop their own teaching practices and skills in order to emphasise task-involvement. The elements of the teachers' goal-setting programme were based on the TARGET-model (Epstein, 1989). The main elements of the goal-setting programme were similar for each teacher (task, authority, rewarding, grouping, evaluation, and timing). The idea was that each teacher tries to develop these important teaching skills towards task-involvement. In the intervention meetings the TARGET elements and teachers' goals were discussed. Also, the discussion dealt with how to change each part of teaching TARGET-model into task-involvement.
3) To start increasing the autonomy of the students in PE lessons. The teachers were asked to give the students the opportunity to choose among given alternatives and to develop actions, drills and games by themselves. In addition, the teachers were asked to take the students into decision-making processes concerning different decisions in PE class.

The fifth meeting (week 45) had three goals:
1) To process practical problems perceived by the teachers in implementing intervention. These problems included games, drills and methods concerning the autonomy.

2) To confirm that all teachers understood and started a goal-setting programme of their own.
3) To direct the teachers to discuss task-involving motivational climate and task-orientation with the students. The purpose of this was to make the students understand the meaning of task-involvement. In addition, the teachers directed the students to assess their own behaviour in physical education lessons.

The sixth meeting (week 47) had two goals:
1) To get teachers' comments and feedback about increasing autonomy of physical education lessons. Teachers' feedback was taken into account when further drills and methods were developed in order to increase students' autonomy.
2) To introduce a goal-setting programme for the students (Appendix 5). The students choose voluntarily two or three special sport skills (e.g., volleyball hit, muscular endurance) they wanted to develop. After choosing these skills, the teachers were asked to advise the students how to measure chosen skills three to four times before the end of the season. Teachers' purpose was also to advice the students in developing methods how to improve their special skills in school PE and in their leisure time. The teachers were asked to give the students free time to practice chosen skills after PE lesson once to twice a month. If the students wanted, the teachers offered to help them in developing special chosen skills.

The seventh meeting (week 48) had two goals:
1) To introduce students' self-evaluation format (Appendix 6). The students were supposed to implement self-assessments concerning their PE experiences from the viewpoint of motivational climate, task-orientation, autonomy, and behaviour. The students were also given the opportunity to evaluate their PE grade according to self-evaluation format.
2) To confirm that the teachers understood and started the students' goal-setting programme.

The eighth meeting (week 50):
1) To get teachers' feedback about the intervention from the beginning to that moment. The teachers were asked to give feedback about the theories, methods, devices, and tasks, which had been presented during the autumn.
2) To plan the spring intervention together with the teachers.

5.2 Phase 2 of the intervention (10 meetings from week one to week 18)

Phase 2 of the intervention took place in the spring and the main emphasis was on practical teaching methods. The intervention was implemented thematically. The spring period was divided into three different themes: a) Student's own improvement, b) Student's important role in physical education lesson, and c) Co-operative learning.

Each theme lasted six weeks. For each six weeks period, the teacher concentrated on a particular theme by discussing it with the students and by developing appropriate drills and methods. At the beginning of each theme period, the teachers used approximately fifteen minutes to guide the students to the theme by discussing what the goals of the certain period were and how to develop assessment methods for a particular theme with them. The students were given a possibility to affect the goals and assessment of each theme. After that, in every physical education lesson, the teachers reminded the students about these goals, methods, and assessments in order to increase students' knowledge about the particular theme. In addition, the teachers developed drills and applied games in order to contribute to each theme. For example in co-operative period, the goal of the period was to increase co-operation, particularly between high and low-skill students. The teachers developed, and let the students develop, drills which included co-operation with other pupils. For example in gymnastics, high skill students created ways of how to assist low skill students to implement certain movements. In addition, after the lessons the teacher and the students assessed how the goal of the lesson had succeeded. Although the thematic implementation had an important role in the spring, the teachers continued carrying out methods, which they were introduced in Autumn 1999. The implementation of the intervention including meeting places, participants of meetings, and structure of meetings was held in the same way as in Autumn 1999.

Meeting 9 took place one week before implementing the 18-weeks period system. Meetings 10, 11, and 12 were included in the students' important role period. Meetings 13, 14 and 15 were included in the students' improvement period and the meetings 16, 17, and 18 were included in co-operative learning period. The meetings 19 and 20 were held after the end measure. The last two meetings concluded the whole intervention year. The contents of the formal meetings of the second part of the intervention will be presented next.

The ninth (week 1) meeting had two goals:
1) To introduce teacher's thematic implementation system, which was asked to be included in their daily teaching. The issue how each theme could be implemented in practice in physical education lessons was discussed.
2) To discuss the increasing autonomy of PE lessons with the teachers. The purpose was to continue to increase the autonomy during the spring. This was done by the same methods as in the autumn. In addition, the researchers were given the drills and methods the teachers used to increase autonomy in the autumn. The researchers delivered these devices to all experimental teachers.

The 10th meeting (week 2) had two goals:
1) To introduce the theme of students' important role to teachers. Discussions how the theme could be implemented in practice in physical education lessons were held. Drills and devices were developed together with teachers and practical suggestions, for example lesson plans were delivered to them.

2) To continue implementing a goal-setting programme for students. This was done by the same methods as in the autumn.

The 11th meeting (week 4) had one goal:
1) To discuss implementing the students' important role theme. Experimental teachers and researchers' ideas were shared and feedback on difficulties in implementing the theme was received from the teachers

The 12th meeting (week 6) had two goals:
1) To discuss implementing the students' important role theme. Experimental teachers and researchers' ideas were shared and feedback about difficulties in implementing the theme was received from the teachers
2) To discuss the increasing autonomy of PE lessons with the teachers. The purpose was to continue to increase autonomy in the spring.

The 13th meeting (week 8) had three goals:
1) To introduce the theme of students' own improvement to the teachers. How the theme could be implemented in practice in PE lessons was also discussed.
2) To discuss whether students' observable behaviour had changed in PE during the intervention.
3) To continue implementing a goal-setting programme for the students. This was done by the same methods as during the autumn.

The 14th (week 10) meeting had two goals
1) To deepen the theme of students' own improvement together with the teachers. How the theme could be implemented in practice in physical education lessons was under discussion. Drills and devices were developed together with the teachers and practical, for instance lesson plans, were delivered to them.
2) To discuss the increasing autonomy of physical education lessons with the teachers. This was done by the same methods as in earlier meetings.

The 15th (week 12) meeting had two goals
1) To discuss implementing the students' improvement theme. Experimental teachers and researchers' ideas were shared and feedback on difficulties in implementing the theme was received from the teachers
2) To continue implementing a goal-setting programme for the students. This was done by the same methods as in the autumn.

The 16th (week 14) meeting had two goals:
1) To introduce the theme of co-operative learning to the teachers. How the theme could be implemented in practice in physical education lessons was discussed. Drills and devices were developed together with the teachers and practical suggestions, for example lesson plans, were delivered to them.

2) To discuss the increasing autonomy of physical education lessons with the teachers. This was done by the same methods as in earlier meetings.

The 17th meeting (week 16) had two goals:
1) To facilitate the theme of co-operative learning together with the teachers. The issue how the theme could be implemented in practice in physical education lessons was under discussion. Drills and devices were developed together with the teachers and practical suggestions, for instance lesson plans, were delivered to them.
2) To discuss fulfilling teachers' diaries. The teachers were supported and asked to add to the diary all used drills and methods as well as their feelings during the intervention. This was supposed to reveal more information about the whole intervention process.

The 18th meeting (week 18) had two goals:
1) To discuss implementing the co-operative learning theme. Experimental teachers' and researchers' ideas were shared and feedback on difficulties in implementing the theme was received from the teachers.
2) To ask the teachers to deliver students' self evaluation format to the students. The students were supposed to implement self-assessments concerning their physical education experiences from the viewpoint of motivational climate, task-orientation, autonomy, and behaviour. The students were also given the opportunity to evaluate their physical education grade according to a self-evaluation format.

The 19-20th meetings (weeks 23-24) had two goals:
1) To make sure that the teachers and the researchers had mutual understanding of what had been done during the intervention. The whole year, including all the procedures presented in the previous paragraphs, was gone through step by step.
2) To give the teachers feedback about the preliminary results of the intervention.

6. Teacher-student level in intervention

The purpose of the following section is to employ the intervention at the teacher-student level. The purpose before the intervention was to collect data, for example on used drills and games by using teachers' diaries. The teachers committed to that method before the intervention. However, the teachers found the intervention demanding and they perceived filling in a diary weekly too heavy. Therefore, the original purpose of fulfilling diary did not come true. However, teachers wrote down some drills and examples they used during the intervention. One example drill which the teachers used in physical education lessons is presented in Figure 3 in order to describe how a certain drill cover TARGET-dimension (Table 1). The presented drills indicate how teachers acted in front of their students in practice. The drills were implemented during co-operative period. The goals were to emphasise students' co-operation and autonomy.

TASK	ORGANISATION	EVALUATION
Try to get balls from the basket and make score (G) Ball needs to go certain route (circle) before scoring.	4-5 students work as a group Equipment: balls and floorball sticks.	After drill, students themselves evaluate the action. Teacher gives feedback about each player's important role and co-operation.
Game is over when there are no balls In the basket. Two teams can play against each other.		Re-evaluation of the drill was made by students. Evaluation criteria: Each player's important role and co-operation.
Students' plan each others' role in advance, and help scorer if missing the score.		
After scoring one ball, students' in a group need to change their roles.		

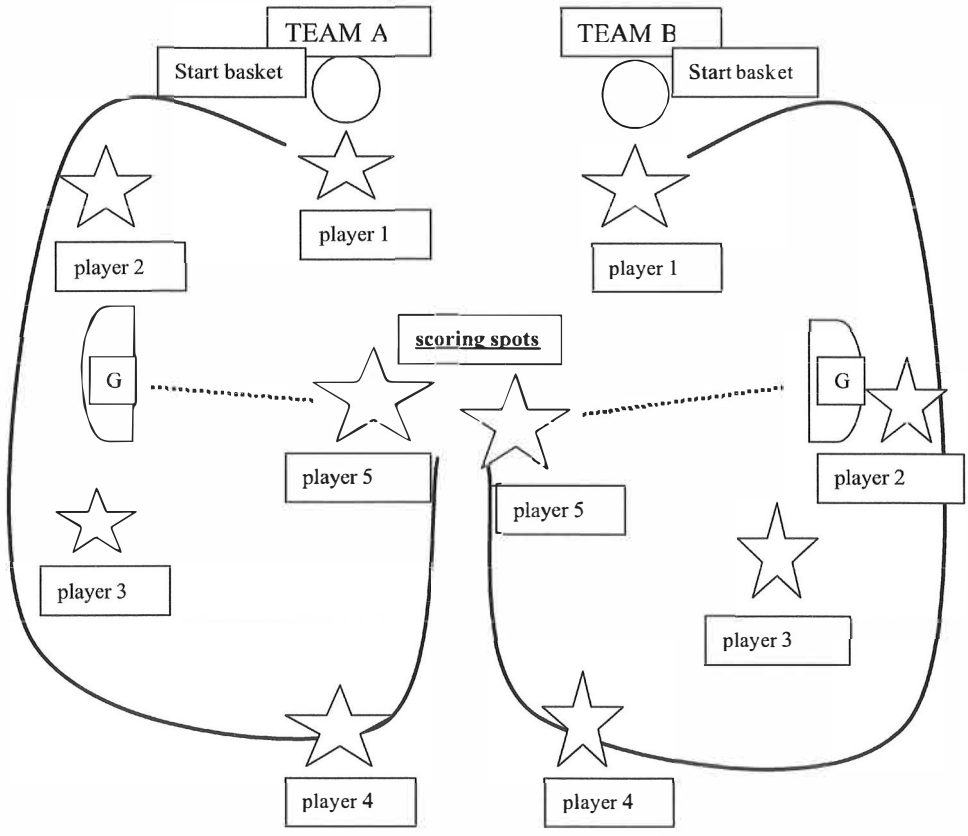

Figure 3. "Floorball scoring" drill.

Table 1. Task-involving TARGET-dimensions in "floorball scoring" drill.

TASK	Students were able to choose as challenging and diverse ways of action as they wanted. The student groups' purpose was to plan how to implement the drills and how to evaluate the outcomes. Students were able to plan the ways of action based on abilities of each group members. Each student had an important role gaining a good outcome. There were many ways to get a good result as a group. The drills emphasised co-operation between members. Students' actions were in their own control contributing feelings of autonomy.
AUTHORITY	Teacher let the students act on their own as a group. All solutions were accepted. Students were responsible for their actions.
REWARDING	Teacher gave feedback on co-operation, each student's important role and improvement as well as effort as a group.
GROUPING	Groups were formulated on the basis of the colour of students' eyes.
EVALUATION	Evaluation was based on students' self-assessments as a group. After the task, group assessed their actions and co-operation by themselves. Each student's role in the group was evaluated. If necessarily, teacher supported and directed students' self-assessments toward task-involvement.
TIMING	Performing time was flexible.

7. The evaluation of the intervention

In the following section the whole intervention is assessed on the basis of teachers comments and researchers' experiences. The teachers' comments on the diary and discussions of that last two intervention meetings were used as examples to illustrate the teachers' feelings during the year. In order to make it easy to follow the responses of the same teacher, four different teachers were coded from 1 to 4 in parentheses, provided after each example. After teachers' comments, researchers evaluate their own experiences concerning the intervention. In addition, recommendations for future motivational climate intervention studies are presented based on researchers' experiences.

7.1 Procedures in the intervention

The procedures within the intervention include the structure of intervention, the number, length and quality of the meetings, teachers' recommendations for further research. Teachers perceived that the structure of intervention was reasonable and flexible. According to the teachers, the meetings included important motivational issues which were rather easy to adopt in practice. In addition, the number and length of the meetings were appropriate in relation to the presented themes. However, teachers suggested that in the future, accurate content of the intervention would be good to deliver before the intervention (e.g., after confirming their willingness to participate in intervention). Secondly, although teachers were satisfied with their autonomy, for instance to develop drills during the intervention, they wished to have more prepared lesson and drill plans during the intervention, which would have decreased their workload.

7.2 Phase one

Teachers had mainly positive experiences with phase one of the intervention. They said their awareness of the basic concepts changed a lot and they learned to recognise these concepts in their teaching. *"The concepts were new and it was important to know the basic concepts before transferring these into practice (1)".* The teachers also observed that phase one of the intervention did not affect students' behaviour and perceptions of the motivational climate completely because the meetings were theoretical. *"In the autumn, a lot of work was done but it was mainly theoretical (3); The intervention did not reach the practice completely in the autumn (2)"* All in all, the teachers were satisfied with the autumn intervention and they did not feel that the autumn was too demanding.

7.3 Phase two

The teachers found the methods in phase two in the spring to be more effective and useful in comparison to the autumn. Specifically, the teachers reported that the strategies were more practical. They had a feeling that there was a "real" intervention going on in the physical education lesson. However, the teachers felt that the spring was much more demanding in comparison to phase one. *"The difference between autumn and spring in implementing the intervention was huge regarding theory and practice; The spring put much more demands on teacher than the autumn did (2); It was hard but afterwards very educational and satisfying (3); I have a feeling that the pupils liked the methods of spring (1)".*

7.4 Delivered material

Teachers perceived that the delivered material was useful and fit for students' age level. However, teachers were slightly confused about the great amount of material at the beginning of the intervention. In addition, some teachers had difficulties in reading scientific articles. In the future, the focus should be in understandable rather than scientific articles and chapters. Also, the delivery of material should be more regular during the intervention. *" I'm going to read the folder in the future in order to develop myself more on motivation and especially in the case of low physically competence pupils"(1).*

7.5 Teachers' and researchers' perceptions of the intervention

At the emotional level, teachers found the autumn to be easier than the spring. Summer holiday had just finished and they were full of energy at the beginning of the intervention. In addition, in the autumn researchers concentrated more on theory and the basic concepts. This more theoretical viewpoint was not so demanding for the teachers. In the spring, teachers were more stressed and tired because of the long autumn. In the spring, teachers concentrated more on practical issues, which demanded more effort. Although teachers were tired and loaded, they said that they were motivated for the intervention the whole time. *"Motivation towards intervention increased during the intervention (1)"*. In the beginning, teachers said that if some particular task or week was too heavy for them they could forget the intervention for a while. Afterwards all four teachers reported that they were satisfied with the participation in the study.

They had a feeling that they had ideas how to develop their teaching. *"It was very satisfying to participate in the intervention, because it had been a long time since I graduated (2); Teaching methods have changed a lot during these years, now the concentration is more on psychological aspects (3); I have no possibility to learn this kind of teaching methods anywhere (1); I'm going to continue this kind of teaching manner, because I noticed that pupils liked them, specially low competence pupils (1)"*.

Researchers' emotions during the intervention followed mainly teachers' emotions. The beginning of the intervention was rather stressful because of the insecurity of practical implementation of the intervention and the motivation of teachers. After that "first confusion" researchers were enthusiastic in implementing the intervention the whole autumn period. In the middle of the spring term researchers perceived tiredness in conducting the intervention, which turned to enthusiasm again. The most difficult issues at the emotional level were organising all meetings and measures as well as researchers' enthusiasm in motivating teachers.

7.6 Teachers comments on used pedagogical practises and means

In the next section, teachers' comments on used teaching methods and devices are collected. In addition, researchers' subjective opinions on methods are presented. These opinions are based on researchers' interpretation of conversations with teachers.

A. Feedback observation system concerning teachers' own teaching

Teachers found the observation system useful. *"Awareness of the motivational climate in my teaching increased (2); Now, I see physical education in a wider scope, including more psychological aspects in my teaching (3)"*. Researchers also found the teachers' observation system useful and educational. It was easy to concretise task and ego involving way to give feedback by using observation system. In future interventions and even in teachers' education, the observation system is a good device to learn feedback behaviour.

B. Increasing autonomy of PE lessons

Teachers found autonomy increasing methods difficult and demanding. *"It was difficult for pupils to understand their own responsibility when increasing autonomy in physica education classes"(2*). Researchers thought that the increasing autonomy was difficult to implement due to its' moderate scheduled nature. In addition, the intervention included a lot of "compulsory" aspects (e.g., students' goal- setting programme, self-evaluation) which complicated the implementation of autonomy in physical education lessons. In the future, more drills and devices should be developed in order to ease teachers' workload in planning process of lessons.

C. Students' self evaluations

The teachers saw students' self-evaluations useful. *"Students understood better what is important in their own behaviour in physical education lesson when implementing self-evaluation (3)"*. Researchers also found students' self-evaluations an educational device for students. All teachers perceived that students' consciousness of their behaviour and expected behaviour in physical education lessons increased. Therefore, students' self-evaluation forms should be further developed in the future.

D. Students' goal-setting programme

Teachers found these goal-setting strategies for the students useful. *"Low perceived competence pupils liked very much the goal-setting procedure (1); They showed enthusiasm toward developing their own skills and they put a lot of effort on these goal*

setting tasks (2); Many of low competence pupils got a new perspective on physical education (4)". Researchers found students' goal-setting programmes worthwhile. It was a good teaching device for students to learn noticing their own development in physical education lessons. In the future, outside school physical activities should be included also to goal-setting programmes

E. Thematic implementation of intervention

Teachers found thematic implementation rather hard because it demanded a lot of planning and work before lessons. *"The thematic implementation was easy to apply to teaching (2); It was a good way to get pupils understand the issues included in the intervention (4), It was a very hard but satisfying job (2); Thematic implementation was educational and it gave a lot of new aspects in my own teaching (3)"*. Researchers' perceptions on the thematic implementation of the intervention mostly followed the perceptions of the teachers'. It was easy to focus on one theme at a time comparing to dealing with all three themes at the same time. In the future, drills and methods where all three themes are considered at the same time, should be developed. In addition, new themes should be designed.

7.7 Evaluation of research methods

Quantitative questionnaires formed the main research method. No problems were found in delivering and filling in the questionnaires. In the future, the challenge would be to implement a persistence test to follow the subjects' development in motivational factors. In this study this was impossible because the subjects did not continue studying in the same school and in the same physical education groups. As mentioned before, the purpose of the researchers was also to collect qualitative data by teachers' diaries, motivational climate observation system, students' thematic interviews, and observers' subjective total assessment of the lesson. However, the goals of collecting qualitative data were not fulfilled for two reasons. First, teachers perceived the intervention demanding and they perceived keeping in diary weekly too heavy. Therefore, the original purpose of keeping a diary did not come true. Secondly, the researchers did not have enough resources to videotape an adequate number of physical education lessons. The same concern existed in the observers' subjective total assessment of the lesson. In addition, it was impossible to arrange the same sport at the same time in each school, which would had been the necessity for videotaping.

The students' thematic interviews were implemented during the intervention. One Master's thesis has been published based on these interviews (Koskimies & Mäkynen, 2000). However, the interview data did not adequately deepen the quantitative data. Therefore the interview data was excluded from Jaakkola's and Kokkonen's PhD thesis.

In the future, deeper interview themes and more often arranged interviews would offer more knowledge of students' perception of motivational climate

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Appendix 2. The contents of the folder distributed to the teachers in the experimental groups

1. Motivational climate; task and ego-involving climate, goal orientation

2. Intrinsic-extrinsic motivation

3. Task-involving feedback, goal-setting for the students

4. Differentiation, grouping and autonomy as foundation of task-involving climate

5. Goal-setting model for teachers

6. Co-operation

7. Helping behaviour

8. Perceived competence, attribution styles in physical education lessons

9. Interaction between teacher and pupils

10. Conclusion of the autumn, ideas for development

Appendix 3

feedback unit	1.publicity				2. specificity				3. affectiveness						4. timing			
	private		public		Specific		general		positive		neutral		negative		immediate		delayed	
	T	E	T	E	T	E	T	E	T	E	T	E	T	E	T	E	T	E
1.																		
2.																		
3.																		
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		
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21.																		
22.																		
23.																		
24.																		
25.																		
26.																		
27.																		
28.																		
29																		
TOTAL																		

Observation scale
continued

5. acceptance of Mistakes		6. comparison		7. attribution		8. direction		9. focus		10. object			total	weighted total
accepts	does not	Self	others	trying	ability	behaviour	Person	process	outcome	individual	group	class		
T E	T E	T E	T E	T E	T E	T E	T E	T E	T E	T E	T E	T E	T E	T E

Appendix 4. The goal-setting model for teachers

Set particular goals for your teaching you want to develop. You can divide the main themes as feedback on sub-dimensions. These can be, for example, emphasising effort, learning from mistakes, and emphasis on self-evaluation. Assess your development on set goals once a month in a continuum of 1 to 10. Also, write down (on the other side of paper) how you can develop each goal.

Task formulation	1 2 3 4 5 6 7 8 9 10
Authority of teaching style	1 2 3 4 5 6 7 8 9 10
Rewarding	1 2 3 4 5 6 7 8 9 10
Grouping practises	1 2 3 4 5 6 7 8 9 10
Evaluation	1 2 3 4 5 6 7 8 9 10
Timing	1 2 3 4 5 6 7 8 9 10

Appendix 5. The goal-setting model for students

Name_____

Class_____

M1 G1 M2 G2 M3 G3 M4

(M= measurement G= goal)

Set three goals concerning
increasing your fitness at
your leisure time during the year
("I go jogging twice a week")

My goals are:

1._____
2._____
3._____

Set three goals for yourself you want to
develop during the year in PE
(if needed teacher gives examples on
sport skills)

My goals are:

1._____
2._____
3._____

Write down how I can improve the set goals in practice ("I have to....three times a week etc.)
1._____
2._____
3._____

Appendix 6. The self-evaluation format of students

Gender_____

School_____

Class_____

Day of birth_____

Date_____

1. What is important in school PE?

Fitness _____

Skills ____

Satisfaction and refreshment_____

Social relationships__ _____

All pupils have an important role in PE class_____

Co-operative learnin_____

Own improvement _____

2. How do you evaluate yourself on a scale from 4 to 10 in PE lessons in this autumn

Fitness ____

Skills_____

Behaviour_____

Report grade_____

3. Answer briefly the following questions

A. Why is sport important

B. What do I want from sport

C. How can I develop and maintain my fitness

4. Develop a training programme for yourself you can implement in the future. Think what kind of sport you want to do, how often, on what intensity, and what your goals are

Appendix 7. The Finnish version of the scales used in the intervention

The Finnish version of the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2)

Seuraavassa sinua pyydetään arvioimaan itseäsi ja omaa liikuntaryhmääsi yleensä. Ympyröi ainoastaan yksi numero, joka parhaiten vastaa sinun käsitystäsi:

Yleensä liikuntatunneillani: 1=täysin eri mieltä...5=täysin samaa mieltä

1. Liikuntatunneilla oppilaat ovat tyytyväisiä silloin, kun yrittävät parhaansa	1	2	3	4	5
2. Liikunnanopettaja hermostuu, jos oppilas tekee virheitä suorituksissaan	1	2	3	4	5
3. Liikunnanopettaja suosii joitain oppilaita toisten kustannuksella	1	2	3	4	5
4. Liikuntatunneilla jokainen oppilas osallistuu tärkeällä tavalla tunnin kulkuun.	1	2	3	4	5
5. Liikuntatunneilla muut haukkuvat sellaista oppilasta, joka pärjää muita paremmin.	1	2	3	4	5
6. Liikunnanopettaja kannustaa oppilaita kehittämään niitä liikuntataitoja, joissa he eivät ole hyviä	1	2	3	4	5
7. Liikuntatunneilla oppilaat auttavat toisiaan oppimaan	1	2	3	4	5
8. Opettaja haukkuu oppilaita, jos nämä metelöivät liikuntatunnilla	1	2	3	4	5
9. Liikunnanopettaja jakaa huomiota vain parhaille urheilijoille	1	2	3	4	5
10.Jokainen oppilas tuntee itsensä tärkeäksi urheillessaan liikuntatunneilla	1	2	3	4	5
11.On tärkeää osoittaa opettajalle, että on parempi kuin muut	1	2	3	4	5
12.Liikunnanopettaja huolehtii, että oppilaat kehittävät niitä liikuntataitoja, joissa eivät ole hyviä	1	2	3	4	5
13.Oppilaat tuntevat onnistuneensa silloin, kun he kehittyvät liikuntataidoissa	1	2	3	4	5
14.Liikunnanopettaja haukkuu oppilaita, jos he tekevät virheitä suorituksissaan	1	2	3	4	5
15.Liikunnanopettaja suosii joitakin oppilaita enemmän kuin toisia	1	2	3	4	5
16.Opettajan mielestä jokaisella oppilaalla on tärkeä tehtävä liikuntatunneilla	1	2	3	4	5
17.Liikunnanopettaja kehuu oppilaita vain silloin, kuin nämä pärjäävät paremmin kuin toiset.	1	2	3	4	5
18.Liikuntatunnilla on tärkeintä mennä eteenpäin jokaisella taitoalueella	1	2	3	4	5
19.Opettaja on tyytyväinen silloin, kun yritämme kovasti	1	2	3	4	5
20.Opettaja antaa ymmärtää, keitä hän pitää parhaina oppilaina liikuntatunneilla	1	2	3	4	5
21.Riippumatta taitotasosta jokaisella oppilaalla on tärkeä tehtävä liikuntatunnilla	1	2	3	4	5
22.Oppilaat auttavat toisiaan tulemaan yhä paremmiksi liikuntataidoissa	1	2	3	4	5
23.Liikunnanopettaja huomioi vain lahjakkaita oppilaita	1	2	3	4	5
24. Liikunnanopettaja kannustaa oppilasta yrittämään aina parhaansa	1	2	3	4	5
25.Oppilaat ”puhaltavat yhteen hiileen” liikuntatunneilla	1	2	3	4	5
26.Jos oppilas tekee pelissä virheitä, hänet otetaan pois pelistä	1	2	3	4	5
27.Liikunnanopettaja kannustaa vain niitä oppilaita, jotka ovat saaneet parhaat tulokset liikuntasuorituksissa	1	2	3	4	5
28.Opettaja kannustaa oppilaita auttamaan toisiaan liikuntatunneilla	1	2	3	4	5
29.Liikuntatunneilla oppilaat pelkäävät tekevänsä virheitä	1	2	3	4	5

Appendix 7 (continues)

The Finnish version of the shortened Helping Behaviour Scale

Seuraavassa sinua pyydetään arvioimaan itseäsi ja omaa liikuntaryhmääsi yleensä. Ympyröi ainoastaan yksi numero, joka parhaiten vastaa sinun käsitystäsi:

Yleensä liikuntatunneillani:	1=täysin eri mieltä...5=täysin samaa mieltä				
1. Olen iloinen, jos saan auttaa	1	2	3	4	5
2. Ei kuulu minulle, jos joku jää jälkeen tehtävässä	1	2	3	4	5
3. Minä todella pidän auttamisesta	1	2	3	4	5
4. Jos itse osaan tehtävän, mutta joku muu ei osaa, autan mielelläni	1	2	3	4	5
5. Minun tehtäväni ei ole auttaa, jos joku ryhmässä tarvitsee apua	1	2	3	4	5
6. Pidän siitä, että joku pyytää apuani	1	2	3	4	5
7. Minä todella pidän siitä, että saan auttaa muita heidän tehtävissään	1	2	3	4	5
8. Mielestäni minun ei tarvitse auttaa	1	2	3	4	5
9. Autan mielelläni, jos joku ryhmästä tarvitsee apuani	1	2	3	4	5

Appendix 7 (continues)

The Finnish version of the adapted and shortened Leadership for Sport Scale (LSS)

Seuraavassa sinulle esitetään väittämiä koskien omaa liikunnanopettajaasi ja hänen toimintaansa liikuntatunneilla. Ympyröi yksi vastausvaihtoehto, joka parhaiten vastaa käsitystäsi

Liikunnanopettajani: 1=täysin eri mieltä...5=täysin samaa mieltä

1. Kysyy oppilaiden mielipidettä tehtävien suorittamiseen liittyvää taktiikkaa laadittaessa	1	2	3	4	5
2. Auttaa oppilaitaan heidän henkilökohtaisissa ongelmissa	1	2	3	4	5
3. Hankkii luokan hyväksynnän tärkeissä asioissa ennen kuin siirtyy asioissa eteenpäin	1	2	3	4	5
4. Auttaa luokan oppilaita ratkaisemaan kiistojaan	1	2	3	4	5
5. Antaa oppilaiden olla mukana päätöksenteossa	1	2	3	4	5
6. Huolehtii oppilaiden henkilökohtaisesta hyvinvoinnista	1	2	3	4	5
7. Kannustaa oppilaita tekemään ehdotuksia tavoista, joilla harjoitukset voitaisiin suorittaa	1	2	3	4	5
8. Kehuu jokaista oppilasta erikseen tarvittaessa	1	2	3	4	5
9. Antaa oppilaiden asettaa itselleen omat tavoitteensa	1	2	3	4	5
10. Ilmaisee avoimesti kaikki tunteensa oppilaita kohtaan	1	2	3	4	5
11. Antaa oppilaiden yrittää omalla tavallaan, vaikka nämä tekisivätkin virheitä	1	2	3	4	5
12. Rohkaisee oppilaita luottamaan opettajaan	1	2	3	4	5
13. Kysyy oppilaiden mielipidettä tärkeistä opetukseen liittyvistä asioista	1	2	3	4	5
14. Pyrkii liikuntatunneilla läheisiin ja välittömiin suhteisiin oppilaiden kanssa	1	2	3	4	5
15. Antaa oppilaiden harjoitella omalla nopeudellaan	1	2	3	4	5
16. Antaa oppilaiden päättää suoritustaktiikoista	1	2	3	4	5

Appendix 8. Statements and response percentages of the PMCSQ-2 at the baseline measurement.

Gender 1=boy 2=girl Date
Day of birth: day month ear
School_____
Class_____

In the following you are asked to evaluate yourself and your physical education group in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
IN MY PE LESSONS:					
1. Pupils feel good when they try their best	6	3	29	40	22
2. The teacher gets mad when a pupil makes a mistake.	37	40	12	8	3
3. The teacher has her or his favourites.	29	33	18	11	9
4. Each pupil contributes in some important way.	5	15	43	23	14
5. Pupils are "psyched" when they do better than their classmates.	50	32	10	6	2
6. Teacher makes sure pupils improve on skills they are not good at.	4	10	26	45	15
7. Pupils help each other learn.	8	21	38	26	7
8. The teacher yells at pupils for messing up.	20	26	30	17	13
9. The teacher gives most of his or her attention to the 'stars'.	27	37	23	11	2
10. Each pupil has an important role.	10	23	44	16	7
11. The teacher praises pupils only when they outplay classmates.	32	35	18	12	3
12. The pupils are encouraged to work on their weaknesses.	7	18	43	24	8
13. Pupils feel successful when they improve in skills.	4	4	14	48	30
14. Pupils are punished when they make a mistake.	48	33	13	5	1
15. The teacher favours some pupils more than others.	19	24	26	20	11
16. The teacher believes that all of us are crucial to the success of the class.	5	11	45	23	16
17. The teacher praises pupils only when they outplay classmates.	20	30	34	12	4
18. The focus is to improve each game/practice.	3	12	22	43	20
19. Trying hard is rewarded.	2	2	10	38	48
20. The teacher makes it clear who she or he thinks are the best pupils.	15	26	31	15	13
21. Pupils at all skill levels have an important role in this class.	5	14	30	30	21
22. Pupils help each other to get better and excel.	11	20	33	28	8
23. Only the top pupils 'get noticed' by the teacher.	28	38	20	11	5
24. The teacher emphasises always try your best.	2	4	18	40	35
25. The pupils really 'work together ' as a team.	10	24	37	20	9
26. Pupils are taken out of the game for mistakes.	55	30	9	3	3
27. Only the pupils with the best "stats" get praise.	34	38	16	7	5
28. The teacher encourages pupils to help each other learn.	5	14	38	30	13
29. Pupils are afraid of making mistakes.	24	20	34	18	4

Appendix 9. Statements and response percentages of the PMCSQ-2 at the end measurement.

Gender 1=boy 2=girl Date_____
Day of birth: _____day _____month _____ __,ear
School_____
Class __ __

In the following you are asked to evaluate yourself and your physical education group in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
IN MY PE LESSONS:					
1. Pupils feel good when they try their best	2	7	30	40	21
2. The teacher gets mad when a pupil makes a mistake.	37	42	15	4	2
3. The teacher has her or his favourites.	22	31	24	16	7
4. Each pupil contributes in some important way.	8	13	36	28	15
5. Pupils are "psyched" when they do better than their classmates.	38	38	16	6	2
6. Teacher makes sure pupils improve on skills they are not good at.	6	10	34	35	15
7. Pupils help each other learn.	6	18	40	30	6
8. The teacher yells at pupils for messing up.	19	27	26	16	12
9. The teacher gives most of his or her attention to the 'stars'.	25	35	23	15	2
10. Each pupil has an important role.	5	18	49	20	9
11. The teacher praises only when they outplay classmates.	26	30	27	12	5
12. The pupils are encouraged to work on their weaknesses.	5	19	36	31	9
13. Pupils feel successful when they improve.	3	8	21	42	26
14. Pupils are punished when they make a mistake.	41	40	13	4	2
15. The teacher favours some pupils more than others.	18	27	29	20	6
16. The teacher believes that all of us are crucial to the success of the class.	3	20	38	23	16
17. The teacher praises pupils only when they outplay classmates.	20	33	31	10	6
18. The focus is to improve each game or practice.	2	12	30	40	16
19. Trying hard is rewarded.	2	4	16	46	32
20. The teacher makes it clear who she or he thinks are the best pupils.	15	26	31	14	14
21. Pupils at all skill levels have an important role on this class.	4	14	31	28	23
22. Pupils help each other to get better and excel.	10	21	34	29	6
23. Only the top pupils 'get noticed' by the teacher.	27	39	20	11	3
24. The teacher emphasises always trying your best.	2	11	27	35	25
25. The pupils really 'work together ' as a team.	10	13	44	26	4
26. Pupils are taken out of the game for mistakes.	48	33	9	5	5
27. Only the pupils with the best "stats" get praise.	28	40	20	8	4
28. The teacher encourages pupils to help each other learn.	4	14	37	31	13
29. Pupils are afraid of making mistakes.	24	22	33	18	3

Appendix 10. Statements and response percentages of the Helping Behaviour Scale at the baseline measurement.

In the following you are asked to evaluate yourself and your physical education group in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
IN MY PE LESSONS:					
1. I am happy, if I have the possibility to help	5	6	25	44	20
2. It isn't my concern, if someone isn't able to perform the task	11	14	47	20	8
3. I really like helping others	5	13	40	30	12
4. If I can perform the task but someone else doesn't, I am happy to help him	4	7	22	45	22
5. It is not my concern to help, if someone in a group needs help	5	8	20	44	23
6. I like it, if someone asks for my help	7	9	33	33	18
7. I really like to have an opportunity to help someone in the PE group	8	11	44	24	13
8. I think that I don't need to help	27	29	24	10	10
9. I am happy to help, if someone in the PE group needs my help	4	9	30	36	21

Appendix 11. Statements and response percentages of the Helping Behaviour Scale at the end measurement.

In the following you are asked to evaluate yourself and your physical education group in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
IN MY PE LESSONS:					
1. I am happy, if I have the possibility to help	2	7	21	46	24
2. It isn't my concern, if someone isn't able to perform the task	9	15	47	20	9
3. I really like helping others	4	12	40	30	14
4. If I can perform the task but someone else doesn't, I am happy to help him	2	7	22	45	24
5. It is not my concern to help, if someone in a group needs help	6	12	22	42	18
6. I like it, if someone asks for my help	5	6	35	36	18
7. I really like to have an opportunity to help someone in the PE group	3	9	42	30	16
8. I think that I don't need to help	23	29	35	8	5
9. I am happy to help, if someone in the PE group needs my help	2	8	30	38	22

Appendix 12. Statements and response percentages of the LSS at the baseline measurement

In the following you are asked to evaluate your physical education teacher and his or her action in PE lessons in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
MY PE TEACHER					
1. Asks for the opinion of the pupils on strategies for specific competitions	8	12	42	25	13
2. Helps pupils with their personal problems	11	19	38	23	9
3. Gets group approval on important matters before going ahead	6	18	43	25	8
4. Helps pupils in the class settle their conflicts	6	16	43	28	7
5. Lets the pupils share in decision-making	7	10	27	36	20
6. Looks after the personal welfare of the pupils	5	17	40	28	10
7. Encourages pupils to make suggestions for ways to conduct practices	6	13	30	33	18
8. Does personal favours for the pupils	3	14	25	41	17
9. Lets the pupils set their own goals	5	10	23	37	25
10. Lets the pupils try by their own even if they make mistakes	6	16	50	17	11
11. Expresses any affection felt for the pupils	3	13	40	28	16
12. Encourages the pupils to confide in the teacher	4	14	41	29	12
13. Asks for the opinion of the pupils on important teaching matters	4	17	36	33	10
14. Encourages close and informal relations with pupils	5	17	47	25	6
15. Lets the pupils work at their own speed	4	10	30	41	15
16. Lets the pupils decide on plays to be used in PE lessons	4	12	38	33	13

Appendix 13. Statements and response percentages of the LSS at the end measurement

In the following you are asked to evaluate your physical educatation teacher and his or her action in PE lessons in general. Circle the number which most resembles your perception:

	1=Fully disagree…5=Fully agree				
	1 %	2 %	3 %	4 %	5 %
MY PE TEACHER:					
1. Asks for the opinion of the pupils on strategies for specific competitions	4	15	44	27	10
2. Helps pupils with their personal problems	10	18	40	23	9
3. Gets group approval on important matters before going ahead	5	16	45	28	6
4. Helps pupils in the class settle their conflicts	6	15	44	29	6
5. Lets the pupils share in decision-making	4	11	27	37	21
6. Looks after the personal welfare of the pupils	7	19	40	28	6
7. Encourages pupils to make suggestions for ways to conduct practices	4	13	33	37	13
8. Does personal favours for the pupils	3	12	25	42	18
9. Lets the pupils set their own goals	2	10	24	40	24
10. Lets the pupils try by their own even if they make mistakes	6	18	50	17	9
11. Expresses any affection felt for the pupils	3	13	42	30	12
12. Encourages the pupils to confide in the teacher	3	15	41	29	12
13. Asks for the opinion of the pupils on important teaching matters	4	12	36	35	13
14. Encourages close and informal relations with pupils	5	14	48	26	7
15. Lets the pupils work at their own speed	4	9	31	41	15
16. Lets the pupils decide on plays to be used in PE lessons	4	13	37	35	11

Appendix 14. Descriptive statistics of Effort/Improvement, Ego-Climate, Co-Operative Learning, Helping Behaviour, and Teacher's Teaching Style at the baseline and end-measurement

	Boys							Girls						
	baseline			end			%change	baseline			end			%change
	x	s.d.	n	x	s.d.	n		x	s.d.	n	x	s.d.	n	
Effort/Improvement														
Experimental	3.92	.58	91	3.76	.63	91	-4%	3.81	.46	87	3.74	.62	87	-2%
Control	3.56	.71	9	3.50	.70	97	-2%	3.65	.55	58	3.47	.64	58	-5%
Ego Climate														
Experimental	2.44	.80	91	2.45	.73	91	0%	2.21	.74	87	2.07	.70	87	-7%
Control	2.67	.89	97	2.61	.74	97	-2%	2.57	.79	58	2.64	.73	58	3%
Co-operative Learning														
Experimental	2.69	.84	91	2.92	.77	91	8%	3.12	.83	87	3.13	.85	87	0%
Control	2.97	.82	97	2.97	.85	97	0%	3.02	.77	58	3.03	72	58	0%
Helping Behaviour														
Experimental	3.20	.75	91	3.42	.70	91	7%	3.94	.66	87	3.98	.69	87	1%
Control	3.33	.72	97	3.31	.77	97	-1%	4.04	.58	58	3.98	.61	58	-2%
Teacher's Teaching style														
Experimental	3.25	.72	91	3.33	.71	91	3%	3.66	.57	87	3.65	.62	87	0%
Control	3.30	.69	97	3.31	.70	97	0%	3.26	.61	58	3.32	.55	58	2%

Appendix 14 continues

	Baseline			End			%Change
Effort/Improvement							
Experimental	3.86	.53	178	3.75	.62	178	-3%
Control	3.60	.66	155	3.49	.70	155	-3%
Ego climate							
Experimental	2.33	.78	178	2.26	.74	211	-3%
Control	2.62	.83	155	2.61	.73	155	0%
Co-operative learning							
Experimental	2.90	.86	178	3.02	.82	178	4%
Control	3.00	.80	155	3.00	.81	155	0%
Helping behaviour							
Experimental	3.56	.80	178	3.70	.75	178	4%
Control	3.59	.76	155	3.56	.78	155	-1%
Teacher's teaching style							
Experimental	3.45	.80	178	3.48	.68	178	-1%
Control	3.29	.65	155	3.32	.64	155	1%

Appendix 15. Intercorrelations between the variables Effort/Improvement, Helping Behaviour, and Teacher's Teaching Style among boys and girls for the baseline measurements (total n=333; 188 boys and 145 girls)

Variables		2	3	4	5
1. Effort/Improvement		-.38**	.37**	.31**	.36**
2. Ego Climate	-.39**		-.30**	-.14	-.28**
3. Co-operative Learning.	.41**	-.33**		.24**	.34**
4. Helping Behaviour.	.19*	-.03	.21*		.48**
5. Teacher's Teaching Style.	.33**	-.57**	.23**	.12	

Note. boys above and girls below the diagonal

** significant at the 0.01 level; * significant at the 0.05 level

Appendix 16. Intercorrelations between the variables Effort/Improvement, Helping Behaviour, and Teacher's Teaching Style among boys and girls for the end-measurements (total n=333; 188 boys and 145 girls)

Variables		2	3	4	5
1. Effort/Improvement		-.42**	.41**	.38**	.60**
2. Ego Climate	-.41**		-.16**	-.18*	-39**
3. Co-operative Learning.	.53**	-.17*		.32**	.39**
4. Helping Behaviour.	.38**	-.05	.40**		.50**
5. Teacher's Teaching Style.	.50**	-.52**	.36**	.25**	

Note. boys above and girls below the diagonal

** significant at the 0.01 level; * significant at the 0.05 level

Appendix 17. Test of within-subjects contrasts as physical education teachers as between-subjects (n =7)

Source	Measure	df	Mean Square	F	p
TIME	Imp./Effort	1	1,687	7.556	.006**
	Ego Climate	1	.193	.587	.444
	Co-operat.	1	.614	1.489	.223
	Helping Be.	1	.768	3.260	.072
	Teaching Sty.	1	.302	1.130	.289
TIME*TEACHER					
	Imp./Effort	6	.218	.977	.441
	Ego Climate	6	.344	1.048	.394
	Co-operat.	6	.416	1.009	.419
	Helping Be.	6	.423	1.798	.099
	Teaching Sty.	6	.146	.545	.774

Appendix 18. Test of within-subjects contrasts as single physical education group as between-subjects (n =17)

Source	Measure	df	Mean Square	F	p
TIME	Imp/Effort	1	2.382	10.768	.001***
	Ego Climate	1	.269	.846	.358
	Co-operat.	1	1.376	3.396	.066
	Helping Be.	1	.580	2.452	.118
	Teaching Sty.	1	.268	1.020	.313
TIME*PE GROUP					
	Imp./Effort	16	.261	1.178	.284
	Ego Climate	16	.548	1.725	.041*
	Co-operat.	16	.561	1.384	.147
	Helping Be.	16	.286	1.211	.257
	Teaching Sty.	16	.310	1.180	.283