

Physical Activity and Life Satisfaction in Adolescence:
The Mediating Role of Initiative

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Abstract

Background: The ability to take initiative is considered an important developmental task in adolescence. Organised leisure time activities have been suggested as especially conducive contexts for initiative development. Therefore, the aim of this thesis was to investigate the relationship between leisure time physical activity, initiative, and life satisfaction in adolescence. The self-determination theory was used to identify factors that facilitate intrinsic motivation, initiative, and life satisfaction. **Method:** The study used data from Norwegian 15 year-olds ($n = 1534$, response rate 58 %) participating in the 2005/06 Health Behaviour in School-aged Children-study. Correlation analysis, two-way ANOVA's, and regression analyses were performed. **Results:** Organised physical activity participation was associated with higher frequency of physical activity [$F(2, 1464) = 155.18, p < .001$], more initiative experiences [$F(2, 1370) = 139.62, p < .001$], and higher life satisfaction [$F(2, 1360) = 19.35, p < .001$]. In addition, initiative fully mediated the relationship between physical activity and life satisfaction for girls [β reduced from .16 to .02], and partially mediated the same relationship for boys [β reduced from .24 to .12] and the entire sample [β reduced from .23 to .10]. **Discussion:** Organised physical activity seemed to be especially beneficial for initiative development. Learning to take initiative also appeared to be important for adolescents' general life satisfaction. A motivational climate that supports intrinsic motivation, competence-building, and social relationships was recommended, to maximise the psychosocial benefits of organised physical activity participation.

Key words: Adolescence; Physical activity; Initiative; Intrinsic motivation; Life satisfaction.

1.0 Introduction

This Master thesis project employed a health promotion- and psychosocial approach, to investigate the relationship between physical activity, initiative and life satisfaction in adolescence. Particular attention was given to the role of initiative, as a possible mediator in the relationship between physical activity participation and life satisfaction.

1.1 Background

Understanding the pathways that can guide children and adolescents into becoming “motivated, directed, socially competent, compassionate, and psychologically vigorous adults” has gained increasing interest in today’s society (Larson, 2000, p. 170). However, how do we get enthusiastic, motivated, and interested youth who take charge of their lives and grow to be healthy, productive, and happy adults? The purpose of this thesis was to illustrate how the development of initiative in organised physical activity can contribute to adolescents’ positive development and well-being.

Promoting physical and psychosocial health through regular physical activity in adolescence has several advantages. First of all, it is now widely acknowledged that regular physical activity reduces the risk of morbidity and mortality from coronary heart diseases (CHD), obesity, diabetes, and certain cancers (Hjelmsæth, 2007; Fox, 1999). In addition, there is a growing body of evidence emphasising the positive relationship between physical activity and psychological well-being (Fox, 1999). Regular physical activity can enable adolescents to acquire important skills, and to have valuable experiences that benefit their self-perception and mood. Accordingly, adolescents’ behaviour and lifestyle are important determinants of their current and future health. There is however limited knowledge on the

effects of adolescents' psychological development from participation in physical activity. Understanding the underlying factors that contribute to peoples' health, well-being, and functioning in society is an important feature of health promotion.

Health promotion was defined at The Ottawa Charter for Health Promotion as the process of enabling people to increase control over, and to improve their health (WHO, 1986). Strengthening adolescents' health is an explicitly stated priority area in several Norwegian public health policies (Regjeringen, 2007; St.meld.nr.16, 2002-2003; St.meld.nr.39, 2001-2002). It is important to secure that adolescents can develop in contexts that are stimulating, in order to build a sense of responsibility for their own life, and to develop individual skills and resources. Furthermore, equal rights and access to developmental opportunities, regardless of familial background and geographic belonging, are stated as prerequisites to realise healthy development for all (Regjeringen, 2007; St.meld.nr.16, 2002-2003; St.meld.nr.39, 2001-2002).

In line with these policies, advocates of positive youth development emphasise the facilitation of settings where adolescents and adults can work and play together on joint activities. This way, young people can benefit from adults' knowledge and experience, thus develop important initiative skills (Jarrett, Sullivan, & Watkins, 2005; Larson, Walker, & Pearce, 2005). Such organised activity settings can create education-, participation-, and social learning opportunities. Furthermore, they provide adolescents with valuable experiences where they can learn to take responsibility, care for others, and develop critical thinking abilities and self-confidence (Larson, Walker et al., 2005). Social contexts in the local communities that can facilitate these experiences, such as organised physical activities, are considered valuable arenas to promote positive development.

1.2 Initiative development

Reed Larson (2000) has suggested that the development of initiative is a particularly important process of positive adolescent growth, especially in the western culture. In this part of the world, a life path is no longer predetermined from birth but characterised by an increasing pace of change. Modernisation of society has brought about a need for autonomous and determined action to a greater extent than before. The ability to initiate and stick to an action plan is therefore vital in terms of professional as well as private settings of life (Larson, 2000). Positive development and health are important prerequisites for being able to initiate and maintain relations, actualise one's abilities, participate and understand one's surroundings, and to communicate effectively (Dwivedi & Harper, 2004; Weisæth, 2000). Adolescents are in this sense facing increasingly complex circumstances, and thus have to acquire sufficient skills to create order and meaning, to function effectively (Hunter & Csikszentmihalyi, 2003; Larson, 2000). Initiative is considered an important life skill to manage the complexities of the modern world, because it entails the ability to take on actions derived from the self, and direct adequate efforts over time in order to reach a goal (Larson, 2000). In addition, initiative functions as an important prerequisite for the development of a range of other positive qualities such as creativeness, leadership, prosocial behaviour, and civic engagement (Larson, 2000).

Although initiative is a highly valued skill in the western society, it has been argued that western adolescents have limited opportunities to learn the skills necessary to take initiative (Benedict, 1938, in Larson, 2000). There is a discrepancy between what is expected from adults compared to adolescents, in terms of initiative and responsibility. The transition from adolescence to adulthood brings on sudden changes, and many young adults are unable to carry through what they intend to do (Gollwitzer, 1999, in Larson, 2000). It is therefore important to create settings where adolescents can obtain the necessary

experiences and acquire the skills needed, to smoothly transform into resourceful and content adults.

Hypothetico-deductive reasoning is developing in adolescence, together with abilities to understand abstract concepts, think analytically, and comprehend emotional processes (Larson, Hansen, & Walker, 2005). This period of life is therefore suggested to be particularly valuable to promote the development of initiative. Initiative development enables adolescents to set goals, distribute efforts over time, and solve problems, which are skills considered important in order to take initiative (Larson, 2000). These skills facilitate growth of further cognitive strategies that are important for self-regulation of psychological states and action over time (Brandtstädter, 1998; Lerner & Busch-Rossnagel, 1981, in Larson, 2000). Considering that adolescents are just starting to develop these skills, they have cognitive limitations that are likely to impact their performance of taking initiative. However, when assisted by others, especially adults, adolescents are capable of functioning at higher levels of planning. According to Gauvain (1999) and Vygotsky (1978) (Larson, Hansen et al., 2005) children and adolescents' interaction with adults are crucial for their development of abilities related to initiative.

1.2.1 Organised physical activity and initiative development

Organised activities have been recommended as appropriate contexts for positive adolescent development, including the development of initiative (Eccles, Barber, Stone, & Hunt, 2003; Eccles & Templeton, 2002; Larson, 2000). The structure and context of the activity, combined with the individual experience of participation, are the elements considered important for positive growth and learning of valuable life skills (Papacharisis, Goudas, Danish, & Theodorakis, 2005). The World Health Organisation (WHO) also

emphasises the importance of providing settings for teaching life skills, in order to promote healthy development, and to prepare adolescents for the increasingly changing demands in adulthood (WHO, 1999). The criteria for an activity to be categorised as an organised activity, are voluntarism (as opposed to compulsory school activities), and a set of rules, constraints, and goals (Larson, 2000).

In organised activities, adolescents gain knowledge of setting goals, team work, problem solving, handling pressure, failures, and successes, as well as communication, and feedback management (Papacharisis et al., 2005). Sports and organised physical activity is the most popular leisure time activity among Norwegian adolescents (Torsheim, Samdal, Wold, & Hetland, 2004). Therefore, through demonstration and practice, organised physical activities can provide high density of growth experiences and ample opportunities for learning valuable life skills, which can be transferred to other domains in life, for a large proportion of the adolescent population.

Knowledge about how young people become motivated to commence and remain in physical activity, and how they develop initiative, is important. Society can then provide applicable facilities, for adolescents to acquire necessary health behaviours and life skills to cope and thrive as they develop into adulthood. Several reports demonstrate that children and adolescents, along with adults, take part in physical activity because of interest, enjoyment, and challenge (cf. Bagøien & Halvari, 2005, p. 6; Frederick & Ryan, 1995). In addition, intrinsic motivation is recognised as an important factor in generating and maintaining participation in physical activity (Ryan, Frederick, Leps, Rubio, & Sheldon, 1997; Frederick & Ryan, 1995). It is further assumed that physically active adolescents will bring their active lifestyle into adulthood, especially if their participation in physical activity is characterised by enjoyment and competence-building (Duda & Ntoumanis, 2005).

1.2.2 Promoting physical activity

Physical activity is an important determinant of people's health. The many psychological and physical benefits associated with regular physical activity are well documented and can no longer be of doubt (Bouchard, Blair, & Haskell, 2007; Penedo & Dahn, 2005; Valois, Zullig, Huebner, & Drane, 2004; Biddle & Mutrie, 2001; Boreham & Riddoch, 2001; Bouchard, Shephard, & Stephens, 1994). Furthermore, low levels of physical activity are associated with reduced well-being and life satisfaction (Ussher, Owen, Cook, & Whincup, 2007; Valois et al., 2004).

The modern society has undergone immense changes in a relatively short period of time, regarding the daily demands of physical activity. Adolescents are in many ways 'forced' into a sedentary lifestyle. In fact, most school hours are spent seated, and many after-school hours are occupied in front of the computer or watching television (Torsheim et al., 2004). In addition, the energy intake has increased, inevitably causing an epidemic of obesity in the western world (Stubbs & Lee, 2004). Furthermore, obesity is associated with increased risk for several serious diseases such as diabetes mellitus, CHD, certain cancers, and ultimately premature death (Hjelmesæth, 2007). The prevalence of obesity in the adult population in Norway has increased with more than 50 percent over the last 20 years, with about 20 percent of both men and women being overweight (Ulset, Undheim, & Malterud, 2007). Similarly, studies carried out in 2000/01 demonstrated that a significant proportion of Norwegian adolescents – 12 percent of 15 year-old boys and seven percent of the girls – were overweight (Lien, Kumar, & Lien, 2007). More recently, an alarming study revealed that over 20 percent of eight and 12 year-olds were overweight (Vilimas, Glavin, & Donovan, 2005). These findings are in line with international literature, reporting that the severity and prevalence of youth obesity is increasing (Daniels et al., 2005).

Although adolescents are generally more active than adults, their school-, and leisure time holds less dominance of physical activity. The Norwegian recommendations for physical activity in adolescence are a minimum of 60 minutes of at least moderate intensity every day (Departementene, 2005). This is coherent with international proposals in line with current available scientific evidence (Strong et al., 2005). About 55 percent of 15 year-olds in Norway meet this recommendation, and boys show significantly higher activity levels than girls in this age group (Klasson-Heggebø & Anderssen, 2003). Further findings indicate that 11-16 year-olds spend only about 2-3 hours per week outside school hours on physical activity, with boys being slightly more active than girls (Torsheim et al., 2004). Comparably, the same cohort spend 40 hours on average outside school hours on sedentary activities such as watching television, using a computer or doing homework (Torsheim et al., 2004). Thus, due to a considerable decrease of physical activity in modern way of life, many of the challenges, skills and experiences from being physically active must now be actively sought after and prioritised (Biddle & Mutrie, 2001).

The Norwegian government's political vision is for its population to have the opportunity to take part in physical activity (St.meld.nr.14, 1999-2000). The first action plan for physical activity world wide, "Together for physical activity", was published by the Government in 2005 (Regjeringen, 2005). The document highlights the importance of making healthy choices easy choices, in relation to lifestyle changes. Three action areas were emphasised as crucial elements in order to increase the level of physical activity in the population. First of all, the physical environment must be organised to ensure universal access for all. Secondly, efforts must be made to create local, low-threshold facilities, and ample opportunities for physical activity in important arenas such as day care centres, schools, work places and in the leisure time. Finally, attempts must be made to encourage an active lifestyle in the population (Regjeringen, 2005).

Leisure time and local communities were pointed out as priority areas for the promotion of physical activity among adolescents in the action plan (Regjeringen, 2005). This is in line with general health promotion ideas, emphasising the importance of creating supportive local environments whereby healthy choices are easy choices (WHO, 1986). Safe environments with opportunities for participation in a variety of physical activities may increase the likelihood for adolescents to find enjoyable activities, and remain in these. Although the activity level of the population is considered too low (Regjeringen, 2005), physical activity is indeed the most popular leisure time activity among adolescents in Norway: eighty-four percent of 15 year-olds reported that they were physically active at least once a week (Torsheim et al., 2004), and thirty-four percent of eight to 24 year-olds were members of a sports club in 2002 (Regjeringen, 2005). Organised physical activities are arenas where a large proportion of adolescents can be reached, and is therefore an ideal setting for health promotion efforts to foster growth and well-being. Moreover, much health-related behaviour is established in adolescence, and it therefore seems natural to aim public health efforts at this age group (Klepp & Thuen, 1995).

1.3 Positive development, physical activity, and life satisfaction

In light of the above reasoning, it can be assumed that physical activity is a valuable arena for promoting both mental and physical health in adolescence. Furthermore, empirical work on life satisfaction in adolescence has received increased attention over the last decades (Huebner, 2004; Huebner & Gilman, 2002), and life satisfaction is considered an important indicator of positive youth development. High levels of life satisfaction are associated with a range of adaptive outcomes; such as high self-esteem, self concept, and self-mastery (cf. Gilman & Huebner, 2006; Suldo, Riley, & Shaffer, 2006; Gilman, 2001). In addition,

adolescents with higher life satisfaction are more content with their school experiences and close relationships, compared to their peers of generally low life satisfaction (cf. Gilman, 2001).

Most adolescents report that they are happy with their lives in both national (Strømsnes, 2003) and international publications (Huebner, 2004). There is however, great variety within this age group. First of all, adolescents with very high life satisfaction show higher adaptive functioning on measures of social stress, attitudes towards teachers, and various measures of intrapersonal functioning, compared to adolescents of average or low levels of life satisfaction (Gilman & Huebner, 2006; Park, 2004; Diener, 2000). Furthermore, fewer adolescents with high life satisfaction demonstrate clinical levels of mental problems, compared to their peers of average or low life satisfaction (Gilman & Huebner, 2006; Park, 2004). Based on these findings, it seems reasonable to aim efforts towards increasing levels of life satisfaction, and it is therefore important to understand the determinants of positive development and life satisfaction in adolescence.

A variety of factors affect life satisfaction in adolescence (Gilman & Huebner, 2006; Huebner, Suldo, Smith, & McKnight, 2004). Firstly at the intrapersonal level, factors such as self-esteem and internal locus of control, have been found to have positive associations with life satisfaction (cf. Huebner et al., 2004). In addition, certain personality traits such as extraversion, agreeableness, and neuroticism, demonstrate strong links with life satisfaction (cf. Huebner et al., 2004; Ryan & Deci, 2001). Such findings indicate that relatively stable characteristics within the individual determine one's level of life satisfaction. In fact, personality traits do generally produce stronger correlates with life satisfaction, compared to demographic variables (Fogle, Huebner, & Laughlin, 2002).

The strong relationship between certain internal factors and life satisfaction may however be interfered by features in the social environment adolescents live in. Family,

friends, school, leisure time activities, and the local community also play important roles for adolescents' development and well-being (Suldo et al., 2006; Park & Huebner, 2005). Moreover, findings reveal that life satisfaction is better predicted by the presence of daily positive experiences, compared to major or daily stressors (McCullough, Huebner, & Laughlin, 2000, in Huebner et al., 2004). Hobbies such as organised physical activities, are thought to be arenas in which adolescents can have daily positive experiences, and thus influence life satisfaction positively (Larson, 2000). Therefore, in organised physical activities, adolescents may have opportunities to build competences, strengthen self-esteem, and develop close relationships, which may be important for their general life satisfaction.

1.4 Promoting adolescent health

Adolescents face a range of developmental tasks and challenges. Positive youth development-researchers propose that the most salient developmental acquisitions in the western society are: healthy physical and psychological habits; a positive approach to school and general achievement; to get on well with other people; and a value system to understand and adapt to the prevailing rules and conducts (cf. Mahoney, Larson, Eccles, & Lord, 2005). Throughout adolescence, the processes of identity formation, feelings of mastery and efficacy, close relationship with peers, as well as preparing for adulthood, become gradually more central (Mahoney et al., 2005).

As outlined above, adolescents face an increasingly complex world that consequently requires increased social versatility during a lifetime. Both family life and the external environment are changing, and social norms play a less significant role in interactions between people (Larson, Wilson, Brown, Furstenberg, & Verma, 2002). Changing family structures provide adolescents with differing levels of social capital,

which in turn may affect their relations to the increasingly diverse group of people they mingle with. Knowledge about the factors that facilitate positive development and initiative in adolescence, may therefore guide more purposeful efforts to reduce the inequalities deriving from such diverse backgrounds (Larson et al., 2002).

Reducing social inequalities in health is a highly prioritised area in Norway (St.meld.nr.16, 2002-2003; St.meld.nr.20, 2006-2007). Such inequalities include systematic differences in people's health condition throughout the social hierarchy (Næss, Rognerud, & Strand, 2007). Although the Norwegian welfare state is characterised by well-functioning educational-, health-, and social services, the inequalities are increasing behind the surface (Mæland, Haug, & Westin, 2002). It is therefore considered important to invest in efforts aimed at minimising such unfair inequalities. Adolescents' health can be strengthened if they find themselves in physical and social environments that provide opportunities, guidance, and support for healthy growth and development. In addition, subsequent challenges can be avoided or reduced by building capacity and competencies in adolescence (Durlak, 2000). Accordingly, motivated and enthusiastic adolescents who are dedicated to learn and develop in school settings, and other arenas of life, may turn out to be invaluable resources for themselves and their surroundings.

Organised leisure time activities are suggested to be particularly suitable arenas for the development of abilities such as initiative, because they assemble features that are important prerequisites for positive development (Larson, 2000). Moreover, organised physical activities are contexts where adolescents can experience feelings of intrinsic motivation, competence, and mastery (Larson, Hansen, & Moneta, 2006; Ryan & Deci, 2000). On top of this, organised physical activities facilitate the development of teamwork and physical motor skills (Scanlan, Babkes, & Scanlan, 2005). Thus, organised physical

activity has the advantage of facilitating psychosocial development and supporting attainment of a physically active lifestyle.

Research on the conditions that foster human growth and well-being is considered important because it can contribute to a broader understanding of the causes of human behaviour. In addition, this kind of research can be valuable to guide the design of social contexts and environments that make the most of human potential. Further research has been called for to investigate the mechanisms that influence adolescents' positive development and well-being. Therefore, rather than focusing on the risks associated with absence from physical activity, this thesis will have an inherently positive outlook by focusing on specific health- and social benefits that arrive from being physically active in adolescence.

1.5 Definitions/descriptions

The main variables used in this thesis are presented below. There are numerous definitions for some of the variables used in the present thesis. However, an attempt has been made to select definitions that embrace important elements of relevance to the concepts at hand.

1.5.1 Physical activity

Physical activity is in this study defined as movements of the body produced by skeletal muscles which result in energy expenditure that can range from low to high, as well as a positive correlation with physical fitness (Caspersen, Powell, & Christenson, 1985). Moreover, for physical activity to have positive physical health outcomes, the energy expenditure must surpass resting level (Bouchard and Shephard, 1994, in Biddle & Mutrie,

2001). A general measure on physical activity, as well as measures indicating whether the activity was done in organised vs. unorganised settings, were applied in the current study.

1.5.1.1 Organised physical activity

Organised leisure time activities are normally voluntary and are characterised by an emphasis on skill- and competence-development, structure in the form of regular scheduled meetings, as well as supervision by adults (Larson, 2000). Adolescents who participate in organised activities have the opportunity to attain competencies and feelings of coping that promote positive functioning. In addition, by building on adolescents' personal and environmental resources, organised activities provide adult-supervised opportunities to develop prosocial skills, in addition to reducing recruitment to "problem-behaviour" (Mahoney et al., 2005).

1.5.2 Initiative

Reed Larson (2000) has defined initiative as the capacity to direct cumulative effort over time to achieve a goal. The ability to take initiative is proposed as fundamental in order to successfully manage the transition from childhood to adulthood in the western world (Larson, 2000). However, in order to take initiative, adolescents must learn the necessary skills required to carry out a desired enterprise, namely goal setting, effort distribution, time management, and problem solving. These skills are thought to be nurtured in settings that facilitate the three elements of intrinsic motivation, determined engagement, and a time perspective (Larson, 2000). Consequently, initiative involves not just starting to do something, but also to stick to the activity (Larson, 2000). According to Larson, all three

elements must come together for initiative to develop. An adapted version of Larson's Youth Experience Survey was used to measure initiative in this study.

1.5.3 Life satisfaction

Life satisfaction is a component of the more comprehensive construct of subjective well-being (SWB). SWB comprises along with life satisfaction the elements of positive and negative affect (Diener, 2000). Although positive and negative affect influence individuals' well-being, life satisfaction involves cognitive judgements and is thought to be a more general, stable, and lasting assessment about a person's life (Gilman, 2001; Huebner, 2004). This study therefore adopted a widely used definition of life satisfaction as the "global evaluation by the person of his or her life" (Pavot, Diener, Colvin, & Sandvik, 1991, p. 150). This definition embraces a subjective, holistic assessment concerning a person's experienced level of happiness, content, well-being, and coping (Diener, 2000). The Student Life Satisfaction Scale (Huebner, 1991) was used as the instrument to measure global life satisfaction in the current study.

2.0 Theoretical framework

The theoretical framework used in this study combines elements from Larson's conceptual structure about initiative development, and the Self-Determination Theory, to illustrate how initiative experiences may mediate the relationship between physical activity and life satisfaction in adolescence. The proposed relationship is illustrated in Figure 1.

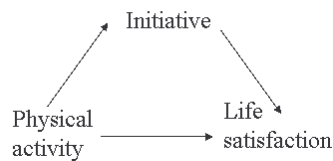


Figure 1. A model where initiative mediates the link between physical activity and life satisfaction

2.1 Initiative development in organised activities

Reed Larson (2000) suggests that initiative develops and emerges from the everyday experiences adolescents have. It is the daily bursts of interest and engagement that is considered important for initiative experiences. However, the majority of adolescents' time is devoted to activities that Larson suggests are not initiative-conducive, because they lack the combination of intrinsic motivation and engagement over time. Participation in organised activities constitutes a small proportion of adolescents' time. However, research indicates that organised activities have positive implications for adolescents' initiative skills (Larson, 2000). Such activities may therefore play a more important role for initiative development, as opposed to schools, where adolescents often are concentrated over time, but lack intrinsic motivation.

Considering that intrinsic motivation is a key element in initiative development in adolescence, it is important to identify the factors that facilitate and promote intrinsic motivation. The Self-Determination Theory attempts to explain the basic features of human

motivation, and is therefore used as this thesis' framework to understand the underlying factors of intrinsic motivation and well-being.

2.2 Self-Determination Theory

Self-Determination Theory (SDT) is a comprehensive theory of human motivation which has developed over the past 30 years, by employing both quantitative and qualitative methods (Ryan & Deci, 2000). It has been applied to a range of domains, including that of physical activity (Hagger & Chatzisarantis, 2007). Furthermore, it has been used in studies with samples of children, adolescents, and adults. Gagné & Blanchard (2007) emphasise that an advantage of SDT is that it allows predictions of environmental factors that influence people's motivation and well-being, as it provides a structure of the needs requiring satisfaction in order to reach a state of well-being.

SDT proposes that human behaviour and well-being must be considered in relation to people's motivation, and the socio-contextual environment they live in (Ryan & Deci, 2000). In terms of physical activity and initiative development in adolescence, SDT can postulate factors that facilitate intrinsic motivation and positive development in settings of physical activity. According to the theory, human motivation varies to the extent that behaviour is self-determined or autonomous. Peoples' motivation ranges on a continuum from amotivated- through extrinsically- to intrinsically motivated behaviour (Ryan & Deci, 2000). Autonomous behaviour is characterised by free will, agency, and choice, whereas extrinsically motivated/controlled behaviours are regulated by external forces and/or involves feelings of pressure (Edmunds, Ntoumanis, & Duda, 2006). SDT suggests that humans have an inherent tendency to "internalise" externally motivated behaviours or

motives, and integrate them to the self, in order to experience that the behaviour or value is deriving from within (Deci, Eghrari, Patrick, & Leone, 1994).

Intrinsic motivation is in SDT defined as the inherent tendency for people to actively develop new skills, take on challenges, and show interest in new activities, even when external rewards are absent (Ryan & Deci, 2007). When adolescents participate in play and physical activities in their leisure time – freely from choice and without coercion or compulsion from external forces – their behaviour is truly self-determined. SDT is based on the assumptions that people have a natural tendency towards self-determination and positive psychological development (Deci & Ryan, 2000; Ryan & Deci, 2000). This inborn tendency is illustrated by people actively seeking situations and activities they can enjoy, and at the same time be challenged in (Deci & Ryan 2000). These descriptions of intrinsic motivation have many similarities regarding taking initiative, and such abilities are important facets of people's natural development. In children and young adolescents, intrinsic motivation can be seen in spontaneous play, whereas older adolescents and adults tend to seek interesting and challenging activities in more organised settings, such as physical activity.

Although adolescents inherently have the tendency to seek challenges and integrate their experiences, the social environment they live in can have great impacts on the propensity to behave in such an active and engaged manner. SDT proposes three basic psychological needs that are essential for healthy psychological growth and well-being (Ryan & Deci, 2000). These include the needs for autonomy, competence, and relatedness. Satisfaction or thwarting of the three needs lead to variations in motivation, development, and well-being. In consequence, as proposed theoretically in this thesis, variations in basic need fulfilment may also lead to variations in initiative experiences.

2.2.1 The needs for autonomy, competence and relatedness

The need for autonomy involves humans having a desire to feel that they are the source of their actions and choices (Deci & Ryan, 2000). For example, when adolescents freely take part in physical activity because they have fun and enjoy the activity, their behaviour is said to be self-determined. Self-determined behaviour entails feelings of volition, agency, and initiative; coherent with Larson's initiative concept. A range of studies suggest that contexts which frustrate the need for autonomy – such as monetary and tangible rewards, threats, surveillance, evaluation, and deadlines – undermine intrinsic motivation because they reduce the individual's feeling of control and freedom (cf. Deci & Ryan, 2000, p. 234). On the other hand, satisfaction of the need for autonomy – such as providing people with freedom and choice – lead to positive outcomes including intrinsic motivation, creativity and endurance (cf. Deci & Ryan, 2000, p. 234). Summing up, the need for autonomy has implications for participants in organised physical activity. If adolescents experience that they have the opportunity to choose and make decisions about what, when, and how they do the activity at hand, the need for autonomy is satisfied. In addition, adult leaders play an important role in either enhancing or undermining intrinsic motivation, by varying the degrees of involvement and control.

Secondly, the need for competence in SDT is based on the suggestion that humans have an innate energy source that seek to influence and manage challenges effectively in the surroundings (Deci & Ryan, 2000). Competence is thus linked to feelings of mastery over one's capacity to act in the environment (Véronneau, Koestner, & Abela, 2005). Physical activity is a popular and important context for many adolescents where they can build on their physical skills, and at the same time develop their interpersonal relations. Competence in this sense therefore involves physical, social, as well as cognitive skills. To take initiative involves competence in the form of various cognitive skills (Larson, 2000).

Therefore, it can be assumed that it is important for adolescents to perceive themselves as competent, in order to initiate, and carry through an action plan. In organised physical activity settings there are many opportunities for satisfying the need for competence: physical activity is by nature an activity where people seek challenges, apply and develop skills, and improve their competences. However, for positive development to occur, it is important that the activity is arranged and facilitated in a manner which ensures that adolescents experience the combination of autonomy and competence (Sheldon, Ryan, & Reis, 1996, in Reis et al., 2000).

Thirdly, the need for relatedness involves a desire to have close and meaningful relationships to significant others (Deci & Ryan, 2000). Building social competence is an important developmental task in adolescence (Mahoney et al., 2005). They must learn to create social networks, and trade the social capital they gain, into the development and maintenance of friendships. Organised physical activity is for many adolescents an important social arena (Wold & Hendry, 1998), and studies have verified that physical activity is important for adolescents to establish social networks (Ommundsen, 2000). The need for relatedness is more distal to intrinsic motivation than the needs for autonomy and competence, as intrinsically motivated actions also are performed in solitude. However, SDT theorises that contexts creating a sense of safe relatedness, will provide more opportunities for intrinsic motivation to flourish (Ryan & La Guardia, 2000, in Deci & Ryan, 2000). Also, the need for relatedness is connected to the need for competence, because constructive feedback from significant others is important for peoples' skill development (Hein & Koka, 2007). In an organised physical activity setting, there are ample opportunities for adolescents to develop and maintain close relationships with their peers, in addition to receiving feedback from peers and adult coaches. Therefore, team-activities may be especially conducive for satisfaction of the need for relatedness.

Essentially, SDT suggests that complementary satisfaction of the three basic needs discussed above, provides favourable conditions for intrinsic motivation, positive development, and ultimately well-being (Deci & Ryan, 2002; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Thus, organised physical activity seems to be an appropriate arena for basic need satisfaction. Consequently, if adolescents experience need satisfaction, as well as concerted engagement over time in organised physical activities, they are more likely to develop initiative as well. Therefore, if adolescents feel that they have some sort of control over their participation in physical activity, feel related to others, and learn skills and feel good about themselves, they will be motivated from within to participate. Intrinsically motivated adolescents will more likely be eager to participate, and consequently be more enthusiastically involved in the activity (Mandigo & Holt, 2000). The following section will elaborate on the basic needs in relation to initiative development.

2.3 Initiative development and the basic needs

As described in the sections above, SDT proposes how adolescents' motivational regulation and satisfaction of three basic needs influence their development and well-being. Organised physical activity is thought to be a safe arena where adolescents can experience satisfaction of these psychological needs, and learn many of the important skills needed for healthy development and functioning.

Intrinsically motivated participation in organised physical activity is characterised by a range of positive developmental outcomes – similar to the “flow”-experience postulated by Csikszentmihalyi – namely commitment, interest, excitement, and enjoyment (Hunter & Csikszentmihalyi, 2003; Larson, 2000). The “flow”-theory suggests that when

people are engaged in activities they find interesting, enjoyable and offers some achievable challenge, they experience “flow”; a state of engaged pleasure and happiness (Henry, 2006). The “flow”-experience is utterly positive, and makes the person experiencing it willing to replicate the activity, and thus facilitates endurance and commitment to an activity. Such “flow”-experiences, or feelings of intrinsic motivation in combination with concentration, plays an important role in development, learning, and socialisation in most domains in life (Frederick & Ryan, 1995; Ryan & Deci, 2000). This is also considered an important element in the development of initiative in organised leisure time activities (Larson, 2000). In consequence, adolescents who experience these feelings of enjoyment and interest in physical activity over time, are expected to believe that they are their own agents and more in control of choosing their actions, thus feeling additionally intrinsically motivated. Furthermore, corresponding to the need for relatedness, Hunter and Csikszentmihaly (2003) suggest that interested and motivated adolescents build psychological capital and relate optimally to their surroundings, by developing more sophisticated and effective internal coping resources.

Physical activity, especially in organised forms, seizes by nature many of the elements that facilitate “flow” and intrinsic motivation, by being interesting, providing opportunities for optimal challenge, allowing social relationships to develop, and enable individual freedom and choice (Vallerand, Deci, & Ryan, 1987). Participation in organised physical activity provides valuable and regular opportunities for adolescents to experience the elements that are considered important for initiative development. Thus, physical activity settings facilitate satisfaction of the basic psychological needs and initiative development in adolescence, illustrating the tight conceptual links between Larson’s initiative construct and SDT. However, the way physical activity is organised in order to satisfy the basic psychological needs, have implications for the development of the skills

needed for initiative experiences. The cognitive and self-regulating abilities required to take initiative, are more likely to be facilitated in settings where adolescents experience autonomy, and where they feel ownership to the activity they participate in (Larson et al., 2004). In addition, if adolescents have the opportunities to reach towards challenging, yet achievable goals, they can learn to cope with the difficulties they meet and experience mastery, which is important for their feeling of competence (Ryan & Deci, 2000). Furthermore, peers and adult leaders play a vital role regarding the social- and motivational climate in the activity (Amorose, 2007). Accordingly, if adolescents experience that the three basic needs are satisfied when taking part in organised physical activity, they will have more experiences of intrinsic motivation, initiative, coping, and commitment, which again will have positive implications for their life satisfaction.

Nevertheless, many organised physical activities are characterised by a range of extrinsic elements. For instance, in many local communities, organised physical activity is the only leisure time activity for adolescents to engage in. It can therefore be assumed that a number of adolescents get involved in such activities because of social pressure and lack of alternatives. Furthermore, many organised activities are inherently competitive. Prizes, trophies, or monetary awards for winning competitions are examples of external rewards that may undermine intrinsic motivation. In line with this, it has been found that athletes who received scholarships reported more extrinsic reasons for participation, and less enjoyment than non-scholarship athletes (Ryan, 1977, in Vallerand et al., 1987). However, extrinsic incentives are not solely negative. When coupled with positive, verbal feedback relevant to the performance and competence of the participant, extrinsic rewards were found to promote intrinsic motivation when autonomy was ensured (Ryan, 1982, in Vallerand et al., 1987). Thus, from an SDT perspective, it is acceptable to award adolescents for their accomplishments, as long as the external reward is unconditional

(ensuring autonomy) and coupled with adequate, positive feedback. According to SDT, external motivations can be integrated to the self, so that behaviours which are not originally intrinsically motivating or interesting, can become internalised (Deci et al., 1994). Internalised, integrated, and intrinsic motivations are associated with higher levels of life satisfaction and well-being (Deci & Ryan, 2000). It is further theorised that intrinsic motivation facilitates greater involvement and commitment, which is important for developmental experiences in organised activities (Larson, 2000).

The tight links between Larson's initiative concept and SDT was illustrated in a recent study which demonstrated that satisfaction of the basic needs were related to feelings of initiative in physical activity in adolescence (Schistad & Bergstøl, 2007). The need for competence was found to be especially salient in relation to initiative development in physical activity, along with adult leadership as an important feature in supporting need satisfaction. Furthermore, autonomy did not seem to be as important for the adolescents' initiative experiences in physical activity as suggested by Larson (2000). Schistad and Bergstøl therefore proposed that the more extrinsic forms of motivation may be compatible with initiative as well. They suggested that initiative cannot be equated with intrinsic motivation. Rather, whilst intrinsic motivation is the ultimate driving force behind human behaviour, initiative can be said to be the ability to carry out the action plans people are more or less internally motivated to do (Schistad & Bergstøl, 2007).

Therefore, Schistad and Bergstøl (2007) proposed, that by combining SDT with Larson's theory of initiative, a theoretical framework is suggested, where the transition from motivation to action can be understood. Furthermore, this framework can provide productive grounds for understanding how motivation contributes to the development of the skills necessary for experiencing initiative in adolescence. Hence, as suggested in this

thesis, social contexts such as organised physical activity, facilitate satisfaction of the three psychological needs, foster initiative development, and promote well-being.

2.4 Initiative as a mediator linking physical activity and life satisfaction

Many studies have demonstrated and confirmed the association between physical activity and life satisfaction (cf. Biddle & Mutrie, 2001; Fox, 1999). The main aim of this thesis was to add Larson's initiative concept to this well-established relation, to empirically test if initiative experiences in physical activity mediated the impact of physical activity on life satisfaction. A mediator is a variable that accounts for the relationship between a predictor and an outcome variable (Baron & Kenny, 1986). In this thesis, the mediation model essentially entails that physical activity participation causes experiences of initiative, which in turn causes increased life satisfaction. If physical activity participation is positively associated with initiative experiences, this may explain why physical activity is associated with higher life satisfaction, and conversely, why a lack of physical activity is related to lower life satisfaction. It can be assumed that the life skills learned from regular physical activity participation have positive effects for adolescents' development, which in turn transfers to other domains in life, and thus provides these adolescents with a strong basis for coping and thriving in a complex world. Therefore, this thesis proposes that adolescents' who experience themselves as active agents in everyday life, are more likely to reach their goals, and therefore also more likely to be satisfied with their life.

The theoretical assumptions emanating from SDT and Larson's work on initiative above, support this thesis' assumption that adolescents who participate in physical activity have more opportunities to experience satisfaction of the three basic needs; autonomy, competence, and relatedness. Moreover, satisfaction of these needs facilitate intrinsic

motivation and integration of more extrinsic motives. The more internally regulated forms of motivation are considered an important element in initiative development and experiences. Ultimately, initiative is considered an important indicator of positive development and as such a predictor of life satisfaction.

3.0 Previous Research

No studies have been found that directly investigate the relationship between participation in physical activity, the experience of initiative, and life satisfaction in adolescence. Research on the concept of initiative is only starting to emerge, as part of the wider research on positive youth development. SDT has on the contrary been researched thoroughly, and has been applied to a range of domains, including that of leisure time activities and physical activity. Some of the studies reviewed in the following sections are SDT research, which can be related to Larson's initiative concept. However, the most important criteria for inclusion in the following sections, were that the studies clarified or supported the expected associations between physical activity, initiative, and life satisfaction in adolescence.

3.1 Research on initiative in organised activities

This thesis adopted Larson's (2000) definition of initiative as the capacity to direct cumulative efforts over time to reach a goal. In fact, most research on the concept of initiative as a central indicator of positive youth development has been conducted by, or in collaboration with Larson. This section includes previous research on adolescents' experiences of initiative in organised activities.

First of all, in a study investigating adolescents' own experiences of their perceived growth processes when taking part in organised activities, Dworkin, Larson, and Hansen (2003) arranged focus groups to get in-depth, phenomenological descriptions of the youth's experiences. The adolescents accentuated the importance of learning to set realistic goals, time management, continuous efforts, and personal responsibility, in organised activities. These are considered the core cognitive skills required to take initiative, and to act on a plan (Larson, 2000). Furthermore, adolescents reported the importance of being "agents of their

own development” by explaining valuable experiences of self-teaching and self-evaluation, whilst taking part in organised activities (Dworkin et al., 2003, p. 24). Feelings of being the driving force behind their own actions seemed to be imperative (Dworkin et al., 2003). In line with these findings, Hunter and Csikszentmihalyi (2003) studied the characteristics of interested adolescents, and demonstrated that feelings of interest had strong parallels with initiative. The authors also found that interested adolescents considered themselves as more “effective agents in their world”, as compared to bored adolescents, in addition to possessing a more positive self-image and attitude to the future (Hunter and Csikszentmihalyi, 2003, p. 33). Thus, interested adolescents can be assumed to be more likely to experience feelings of coping and effective functioning, and consequently more likely to take initiative and develop skills.

Furthermore, when following adolescent participants in three organised activities over a period of time, Larson and colleagues confirmed that in relation to initiative experiences, the cognitive abilities highlighted in Dworkin et al.’s (2003) study above, were skills that developed throughout the course of participation (Larson et al., 2004). Moreover, the capacity to take initiative and the confidence gained, transferred to other arenas in life as well (Larson et al., 2004). Additionally, in line with SDT, the adolescents also experienced an internalisation of motivation whilst taking part in the activities, as a great majority of participants reported a change to intrinsic reasons for continuing the activity over time. The voluntary element of choosing which activity to participate in was emphasised as the reason for the change in motivation (Larson et al., 2004). In addition, Csikszentmihalyi’s idea of “flow” emerged in the adolescents’ narratives; as they participated in the various activities, they experienced that the challenge of doing the activity was in itself internally rewarding and fun (Csikszentmihalyi, 1990, in Larson et al., 2004). Organised activities thus seem to facilitate adolescents’ opportunities to experience

the important balance of challenge and enjoyment. These findings support the idea that autonomous actions, in combination with challenge, are important elements for the development of initiative, but also for internalisation of motivation.

Similarly, Larson et al. (2005) found that adolescents who participated in organised activities, reported consistently higher levels of motivation and attention, attributes that are likely to promote initiative development. Additionally, research has revealed that significantly higher rates of learning experiences related to the development of initiative were found when adolescents took part in organised activities, compared to general school work, or when they spent time with friends (Hansen, Larson, & Dworkin, 2003). This implies that structured activities have the potential to fill a gap in developmental opportunities outside school hours. Combined, high levels of motivation, concentration, and challenge seemed to be salient features of adolescents' developmental experiences in organised activities (Larson et al., 2004).

Furthermore, a recent study examined the differing elements of developmental experiences in organised activities (Larson et al., 2006). First of all, organised physical activity stood out as an activity associated with conspicuously more experiences related to initiative, compared to other activities, indicating that the nature of physical activity is especially valuable for initiative development. Continuous efforts and goal setting were salient elements of initiative experiences in physical activity settings. However, all the activities measured showed a generally higher level of developmental experiences, compared to the control settings of school, work, and hanging out with friends (Larson et al., 2006).

Moreover, Hansen and Larson (2007) found that the more time adolescents spent in organised activities, the more positive developmental experiences were reported, indicating a dose-response relationship. Secondly, in line with SDT, participation based on enjoyment,

fun, and future goals were associated with increased intensity of growth processes. Thirdly, holding a lead role in the organised activity also independently predicted more positive experiences. Finally, the number of adolescents per adult leader was only a modest predictor of positive experiences. The authors found that the factors above were more important for the developmental experience, than the type of activity itself. This finding emphasises that it is the structure of organised activities that is significant for growth opportunities, not the activity per se (Hansen & Larson, 2007).

When the developmental states reported above are seen in relation to SDT, it can be inferred that the needs for autonomy, competence, and relatedness are important for the development of initiative, as well as general life satisfaction. In organised activities, adolescents have great prospects for developing close friendships, and increase their social capital with peers and adult leaders (Dworkin et al., 2003; Larson et al., 2004). The adults' role in organised activities is also important, as they must manage to balance the adolescents' feeling of autonomy, in addition to providing directions and guidance. Findings indicate that adult leaders who are either too passive, or leaders who overtake control, remove important opportunities for adolescents to experience the necessary agency that promote positive development (Larson et al., 2004).

Combined, this sample of previous research on initiative development and experiences, supports this study's assumption that organised activities are suitable arenas for positive developmental experiences. Organised physical activity seems to be especially valuable for the development of initiative, because it entails learning experiences that are considered important for positive growth.

3.2 Research on life satisfaction and physical activity

Physical activity habits have been widely researched in the western world, and implications for both physical and psychological health have been well documented, especially in adults (cf. Biddle & Mutrie, 2001). Expanded focus has, in recent years, also been given to study the health-enhancing effects of physical activity participation in adolescence (Biddle, Gorely, & Stensel, 2004). Findings from such studies indicate that on the one hand, participation in physical activity is positively associated with well-being. Lack of physical activity, is on the other hand linked to reduced well-being. This section provides a selection of relevant literature that illustrates the relationship between physical activity and life satisfaction in adolescence.

Firstly, in a sample of Danish adolescents, physical activity was positively related to life satisfaction, in addition to other positive outcomes, such as social integration with friends and family (Holstein, Ito, & Due, 1990). Secondly, findings from Norway indicate that more physically active adolescents, have more positive attitudes towards own health, compared to the less active (Nesheim & Haugland, 2003). Furthermore, when investigating the relationship between television-habits, life satisfaction, and physical activity among Norwegian adolescents, researchers found that physical activity was positively associated with life satisfaction. On the contrary, adolescents who spent a lot of time watching television indicated lower life satisfaction (Henrikson & Nordenson, 2004). Thirdly, more participation in vigorous sports was associated with reduced risk of psychological problems, in a study investigating the association between sports participation and well-being of 16 year-olds, even when gender, socioeconomic status and disability/illness was controlled for (Steptoe & Butler, 1996). Furthermore, the Youth Risk Behaviour Survey measured life satisfaction and physical activity habits in a representative sample of 9 to 12 graders (Valois et al., 2004). The main findings indicated that low levels of physical

activity were associated with lower life satisfaction. Finally, other findings demonstrate that the more active students had better perceived health, fewer depressive symptoms, and higher life satisfaction than their peers (Piko & Keresztes, 2006).

Combined, these findings indicate that physical activity is positively associated with life satisfaction in adolescents.

3.2.1 Research on organised physical activity and life satisfaction

Organised activities have been suggested as arenas with ample developmental opportunities for adolescents. One aim of the present thesis was to explore whether the structure of the physical activities had implications for adolescents' life satisfaction. Previous research which indicate that there are positive relations between participation in structured activities and life satisfaction, are presented next.

For example, Maton (1990) found a positive association between participation in organised activities and life satisfaction, in an adolescent sample. In a similar vein, Gilman (2001) assessed the link between frequency of extracurricular activities and life satisfaction. The author reported that adolescents who took part in more organised activities, demonstrated higher school satisfaction than their peers, with minimal or no such participation. Furthermore, in a study investigating the association between psychological well-being, delinquent behaviour, and organised activity participation, both parent/caregiver and adolescents' self-reports on identity-experiences were explored (Palen & Coatsworth, 2007). General activity participation was positively related to adolescent-reported well-being, and was negatively associated with adult-reported externalising behaviour and adolescent-reported delinquent behaviour. More specifically, goal-directed behaviour, "flow", and personal expressiveness, were positively associated adolescents'

well-being. Interestingly, goal-directed behaviour, which is an important feature of initiative development, contributed uniquely to well-being in the 16 year-olds in this sample. The authors argued that learning to set and achieve goals in organised activities, are valuable skills in adolescents' identity-formation, which has implications for their well-being (Palen & Coatsworth, 2007).

The theoretical framework used in this study, proposes that intrinsic motivation is a key indicator of life satisfaction. Therefore, social contexts such as physical activity which facilitate intrinsic motivation, can be assumed to promote general satisfaction and well-being. Wang and Biddle (2007) for example, conducted several studies where they incorporated elements from SDT with other conceptually related motivational theories. They used cluster analysis to investigate the relationship between various motivational profiles of 12 to 16 year-olds, and their physical activity behaviours and self-beliefs. They found that the combination of self-determination, achievement goals, and ability beliefs, were associated with adolescents' motivational characteristics, physical activity habits, physical self-worth, and self-esteem. Furthermore, higher self-determination, incremental ability beliefs, and a task-oriented goal approach were associated with positive outcomes. These included increased physical activity participation and positive self-worth (Wang & Biddle, 2007), which are features that can be assumed to have positive relations with individuals' life satisfaction. Moreover, linking these findings to Larson's initiative construct, adolescents with high incremental beliefs, perceived autonomy, and high self-worth, may be more likely to develop and improve their skills, and to take initiative and develop strategies for future actions.

Other studies demonstrate that physical activity settings are suitable for promoting intrinsic motivation, if the context supports satisfaction of autonomy, relatedness, and competence. For example, in a sample of females enrolled on a physical activity program it

was found that perceived autonomy support from friends, were positively associated with internalised and intrinsic motivation (Wilson & Rodgers, 2004, in Edmunds et al., 2006). In addition, an autonomy supportive physical education climate was positively related to satisfaction of the three psychological needs posited in SDT, and consequently predicted increased intrinsic motivation (Standage, Duda, & Ntoumanis, 2003, in Edmunds et al., 2006). There has however been limited research on the relation between satisfaction of the psychological needs and well-being (Wilson & Rodgers, 2007). Nevertheless, tentative findings suggest an association between satisfaction of the basic needs and well-being in adults, in the domain of organised physical activity (Wilson & Rodgers, 2007). Corresponding to the above findings, Bagøien and Halvari (2005) found strong support for a positive association between participation in leisure time physical activity and autonomous motivation among adolescents. The authors also reported findings of a reciprocal relationship between involvement in physical activity, motivation, and perceived competence. Thus, participation in physical activity may influence competence and motivation, and conversely, motivation and competence may lead to physical activity involvement (Bagøien & Halvari, 2005). In line with this, Schistad and Bergstøl (2007) also found that feelings of competence have implications for motivation in physical activity.

The above findings indicate that there is a link between the positive experiences emanating from participation in organised physical activity, and life satisfaction, thus supporting this thesis' supposition that involvement in such activities is associated with increased life satisfaction.

3.2.2 Research on gender differences in initiative and life satisfaction

Little research has been conducted on gender differences in developmental experiences, such as initiative. However, autonomy and agency are important features of initiative, and research on autonomy among adolescents suggests that boys and girls differ on this dimension. Girls are more likely to have a sense of communion – a caring orientation towards others with an emphasis on cooperation – whilst boys seem to be more agentic and self-assertive (Helgeson, 1994, in Zimmer-Gembeck & Collins, 2006). These findings indicate that adolescent boys may feature more of the characteristics that are considered important for initiative development, than their female counterparts. However, in a study investigating the associations between SDT's basic needs and Larson's initiative construct, no gender differences were found in the need for autonomy (Schistad & Bergstøl, 2007). Both genders therefore seemed to experience satisfaction of the need for autonomy whilst taking part in organised physical activity. Moreover, Larson's research on developmental experiences in organised activities have not found consistent results revealing gender differences in experiences of initiative (Larson et al., 2006).

Furthermore, in relation to autonomy, Helgeson (1994) also reported that agency was associated with increased well-being. Communion was on the one hand linked to social support and positive relationships, yet on the other hand with greater mental distress. Given that girls are more communion-oriented than boys, they are more likely to experience psychological distress than their male equivalents. Further findings confirm that girls experience more negative affect and higher frequencies of depressive symptoms, than boys during adolescence (Nolen-Hoeksema & Girgus, 1994, in Rosenblum & Lewis, 2006). Despite this, Gilman and Huebner (2003) report equivocal results on global life satisfaction across age and gender. Their review of research on life satisfaction with children and adolescents, revealed that some studies reported higher life satisfaction amongst males.

However, the majority of studies maintained that life satisfaction is invariant across age and gender (Gilman & Huebner, 2003).

Regarding physical activity, it has been well documented that boys participate more than girls (Torsheim et al., 2004; Livingstone, Robson, Wallace, & McKinley, 2003; Larson & Verma, 1999; Steptoe & Butler, 1996). This is also reflected in the membership distribution among 13 – 19 year-olds in the Norwegian Olympic and Paralympic Committee and Confederation of Sports (NIF), where 57 percent of members are boys (NIF, 2006). Also, in a study assessing general trends of adolescents' behaviour and habits in Norway, over half the boys and four of ten girls, reported that they exercised in an organised physical activity setting during the last week (Øia & Bakken, 2002). There also seemed to be a tendency for boys to be more engaged in organised physical activities compared to girls, who to a greater extent exercised on their own (Øia & Bakken, 2002). In addition, it has been found that boys across countries most often report sports and physical activity as self-defining experiences (Sharp, Coatsworth, Darling, Cumsille, & Ranieri, 2007). Girls, on the other hand, more often reported socialising-, instrumental-, and literary activities. The experiences boys have in physical activity may therefore be qualitatively different from girls' experiences, and thus accordingly affect the genders differently.

Although previous research is inconclusive with respect to gender differences in adolescent experiences of initiative and life satisfaction, this thesis assumed that boys have increased opportunities to participate in valuable developmental experiences in organised physical activity, and thus demonstrate higher levels of initiative and life satisfaction.

3.3 Research on dosage of physical activity and initiative

In a study where a set of factors related to growth experiences in leisure time activities were evaluated, it was found that adolescents who spent more hours per week in organised

activities, had more developmental experiences (Hansen & Larson, 2007). The researchers also investigated the impact of dosage on negative experiences in such activities, and found that the amount of time spent in the activity was not significantly related to experiences of stress, inappropriate adult behaviour, negative influences, nor social exclusion. Given these findings, and the theoretical framework outlined above, this thesis also suggests that increased participation in physical activity is associated with increased initiative experiences.

3.4 Research on initiative as mediator

No previous research was found that explicitly explored the mediating role of initiative, in the relationship between physical activity and life satisfaction in adolescence. Nevertheless, the compilation of the above research supports the proposed relationships between the variables in the mediation model. The mediated relationship essentially involves that physical activity participation causes experiences of initiative, which, in turn causes life satisfaction. There are however certain factors that must be considered when evaluating the causal nature of the relationship between variables (cf. Adrian, James, David, & Neville, 2002). First of all, strong statistical associations between the variables and replication of the findings must be in place to support a causal relationship. Secondly, the predictor variables must precede the outcome variable in time. Thirdly, a dose-response relationship between the variables verifies the causal nature of the association. And finally, the suggested causal model must have a sound theoretical basis. The following paragraph demonstrates how this thesis features the majority of the above assumptions of the causal role of a mediator.

First of all, empirical findings indicate a range of positive physical and psychological consequences from regular physical activity participation (Biddle et al.,

2004; Biddle & Mutrie, 2001; Boreham & Riddoch, 2001; Bouchard et al., 2007). Secondly, organised physical activity is suggested as an especially appropriate setting for the development of initiative (Larson, 2000; Larson et al., 2006; Larson, Hansen et al., 2005; Larson et al., 2004). Third, Larson's initiative construct incorporates many of the elements proposed in SDT as fundamental for intrinsic motivation and well-being. Furthermore, SDT claims that satisfaction of the basic psychological needs of competence, autonomy and relatedness is a necessary prerequisite for people to experience intrinsic motivation and well-being in life (Ryan & Deci, 2000). In line with this, Larson (2000) has suggested that the needs underlying life satisfaction in SDT, also has implications for development of initiative. Fourth, a recent study supports the theoretical foundations of SDT and Larson's concepts on positive youth development, by demonstrating that satisfaction of the three psychological needs facilitates experiences of initiative among adolescents in the area of physical activity (Schistad & Bergstøl, 2007). In addition, research on the dosage of participation in physical activity indicates that the more participation, the more experiences of initiative (Hansen & Larson, 2007), and thus, the higher life satisfaction, supporting the causal relationship between the variables.

In light of the above reasoning and empirical findings emanating from SDT and Larson's initiative concept, it can be hypothesised that varying degrees of initiative experiences in physical activity, account for variations in the strength of the relationship between physical activity and life satisfaction.

Given the research on gender differences in section 3.2.2, the same suppositions apply to the mediating role of initiative. Considering that boys participate in more physical activity than girls, and that they are more agentic and self-assertive – which has positive implications for their well-being – it can be assumed that initiative experiences in physical activity play a larger role for their life satisfaction compared to girls.

4.4 Research on socioeconomic differences in health in adolescence

Socioeconomic differences in health involve systematic variations in health status, as a result of social position (St.meld.nr.16, 2002-2003). Such differences are an increasing challenge in the Norwegian society (Mæland et al., 2002). Research on social inequalities in adolescence has received augmented attention over the recent years, and more appropriate and valid measurements have been developed to measure socioeconomic status (SES) in this age group (Currie et al., 2008). This section provides research that illuminates socioeconomic issues in relation to the indicators of relevance to this study.

The SES of families has been shown to influence adolescents' participation in organised leisure time activities, with decreased participation among adolescents with low SES (Casey, Ripke, & Huston, 2005). Regarding physical activity, recent data from Statistic Norway revealed that there is no clear-cut relation between children and adolescents' physical activity habits and their socioeconomic status (Vaage, 2006). Children and adolescents of parents with high income were most active, but the general activity level in all groups did not differ to a great extent. There was however, a tendency for those from low income families to be less active, than youth from more affluent homes (Vaage, 2006). In line with this, international studies from the western world report that the amount of time spent on physical activity was greater among adolescents with higher SES (Larson & Verma, 1999). Furthermore, several studies demonstrate that SES predicts moderate and vigorous physical activity among adolescents (Currie et al., 2008).

Concerning socioeconomic differences in life satisfaction, studies have revealed that psychological distress and poor well-being was associated with lower SES in adolescents across countries (Currie et al., 2008). In addition, strong associations have been found between SES and health related quality of life in adolescents from a range of European countries. Furthermore, findings on social inequalities among adolescents in Germany,

revealed that the influence of SES on adolescents' health was multifaceted (Richter, 2005). Although the impact of SES did affect a variety of health outcomes, no significant health inequalities were found regarding life satisfaction (Richter, 2005).

Larson et al. (2006) did not find any interaction effects, when controlling for demographic variables whilst evaluating developmental experiences among a range of organised activities, and concluded that adolescents have relatively similar experiences independent of their gender and socioeconomic background.

Combined, these findings demonstrate inconsistency regarding the effect of SES on adolescents' health and well-being. Although SES is not a key variable in the current study, it is considered necessary to control for SES because it may be a confounding variable that accounts for important variation in the relationship between the main variables. In this thesis, SES is included as a possible moderator that affects the relationship between physical activity and initiative/life satisfaction. A moderator is a variable that is assumed to change the relationship between a predictor and an outcome variable.

4.0 Research Questions

Based on the theoretical assumptions and the empirical findings presented above, this thesis extended previous research by examining the relationship between physical activity, initiative, and life satisfaction. More specifically, initiative was suggested as a possible mediator, explaining how physical activity predicts life satisfaction. Figure 1, page 22, illustrates the hypothesised relationship. The proposed model is simplistic in nature, as it attempts to explain how only two variables account for variation in life satisfaction.

Research on initiative development in adolescence is a relatively new endeavour, and research on the topic in Norway can still be considered explorative. An aim of this thesis was therefore to describe the sample thoroughly, in terms of the adolescents' physical activity habits in relation to their initiative- and life satisfaction scores, on top of the mediation hypothesis. The research questions are presented next.

Research question 1. **1a.** To what extent do levels of initiative- and life satisfaction differ, among adolescents who participate in organised physical activity, adolescents who participate in physical activities unorganised, and adolescents who do not participate in physical activity?

1b. To what extent do the genders differ in levels of initiative and life satisfaction, in the three physical activity groups stated above?

Research question 2. **2a.** To what extent is there a dose-response relationship between participation in physical activity and initiative experiences?

Research question 3. **3a.** To what extent does initiative mediate the relationship between physical activity and life satisfaction?

3b. To what extent does the mediation effect differ for boys and girls?

Research question 4. **4a.** To what extent does SES moderate the relationship between physical activity and initiative / life satisfaction?

5.0 Method

The analyses conducted for this study was based on Norwegian data from a WHO cross-national survey; Health Behaviour in School-aged Children (HBSC). The overall aim of the HBSC-survey is to increase our understanding of children and adolescents' health, in order to inform and influence health policies and practices from a health promotion point of view (HBSC, 2002). The HBSC-network currently consists of 43 countries.

The HBSC-survey focuses on health and health behaviours in 11- to 16 year-old adolescents. The survey views health in its broadest sense, as a resource for everyday living. It therefore includes questions that tap into aspects of social, physical, and emotional well-being (Currie et al., 2004). The questionnaire is developed by an international research network, and was piloted in a sample of the participating countries before data collection. In addition, test-retest analyses were carried out to examine the scales' reliability. The standard questionnaire is used by all participating countries. It contains a core set of questions which examine demographics and social background, individual and social resources, health behaviours, and health outcomes (HBSC, 2002). In addition, the survey has focus areas that vary from year to year. Furthermore, countries may add supplementary items of particular interest in their national questionnaires. The HEMIL-centre, Centre for Research on Health Promotion in Bergen, is responsible for the international data bank, which is stored at the Norwegian Social Science Data Services.

There have been seven data collections in Norway since 1983. The Norwegian questionnaire is translated from the international standard instrument. Data from the last collection in 2005/2006 was the basis for the analyses carried out in this study. The current HBSC-study was financed by the Research Council of Norway – Medicine & Health, the Norwegian Board of Health Supervision, and the Directorate for Health and Social Affairs.

5.1 Participants

Participants in the study were recruited in 2005/06. The sample was selected by systematic cluster sampling, and the primary sampling unit was a school class. The participating classes were drawn from a list of all secondary schools in the country. The list was ordered by region, and by the municipalities' number within the region. Every 'x' school was drawn from the list, starting on a random number between one and 'x'. All students in the selected classes were invited to participate in the study.

The entire 2005/06 sample consisted of 515 school classes, with a total of 7664 students distributed over four class levels. Data based on responses from 15 year-olds was used in this study, as they responded to all the measures of relevance to answer the current research questions. The sample (n = 1534) thus consisted of 815 boys (53.1 %) and 719 girls (46.9 %), with a mean age of 15.5 years. They were all in their final year of upper secondary school at the time.

The final response rate for the 15 year-olds was 58 percent. Thirty-one percent of the schools rejected participation, whereas only 15 percent of the students dropped out. An 85 percent response rate at student level can be considered high for this type of surveys. The high withdrawal at school level is assumed to reflect a lack of time and resources in the schools. Schools are asked – and sometimes instructed – to participate in a range of surveys throughout the year. It is therefore expected that it was the excessive work load that hindered schools from participating in the HBSC-study, rather than actual underlying differences in the schools that participate. It was therefore not considered necessary to include replacement schools, similar in for example locality and economic structure, to the withdrawers in the Norwegian HBSC-study.

5.1.1 Sampling issues

Cluster sampling encompasses a possible source of error, because the samples are drawn from bigger groups (classes in this case), not random individuals (students). Students from the same class are normally more similar than students in general, and their responses can therefore not be considered completely independent of each other (Currie et al., 2004; Wold, Hetland, Aarø, Samdal, & Torsheim, 2000). Therefore, a consequence of cluster sampling is a higher standard error compared to simple random sampling. When standard error increases, the sample size should also be increased to maintain a satisfactory level in the precision of estimates. This project does however satisfy the minimum required sample size, and high precision can be assumed (Currie et al., 2004).

Variance components estimates were calculated using SPSS, to test the design effect of cluster sampling on the outcome variables of initiative and life satisfaction. The analyses revealed that a very small proportion of the variance in both initiative (eight percent), and life satisfaction (six percent), were explained by the school class they belonged to. This was expected, considering that the scales used were not directly linked to school situations. Previous research using cluster sampling conducted at the HEMIL-centre, has indeed demonstrated that school class predicts very little of the variance in variables not related to the school environment.

5.1.2 Generalisability

Regarding the generalisability of the results, participants in this study were selected based on systematic cluster sampling, derived from a stratified list of schools. Such stratification ensures that a true proportion of the population is represented in the sample (Cresswell, 2003). Schools were randomly selected from the stratified list, which further ensures

generalisability. However, almost a third of the invited schools from the stratified list declined participation. Although finding replacement schools to the withdrawers were considered unnecessary, it must be acknowledged that the abandonment at school level possibly was selective. It may be that the withdrawer schools were characterised by common factors, such as disadvantaged area, understaffing, problem behaviour among students, et cetera. Such factors may affect the representativeness of the sample of adolescents participating in the current study, and it must be considered when interpreting the results. However, the sample size in this study was high, and a high degree of generalisability can therefore be presumed.

5.2 Procedure

The HEMIL-centre initially appealed the Ministry of Church, Education, and Research Affairs to recommend the HBSC-project to educational departments and schools in the country. Next, the educational departments in all the municipalities selected from the cluster sampling were approached. When the project was accepted by the educational departments, requests were sent out to all the schools. Finally the surveys, including an instruction letter, were sent to the schools a short time before the surveys were to be carried out.

The questionnaires were administered by teachers and carried out in the class room. Before handing out the forms, a short instruction letter describing the procedure was read aloud by the teacher responsible for the data collection. A standard procedure was followed by the teachers to ensure school- and student anonymity; to secure that the conditions under which the surveys were carried out were as similar as possible for all participants; and to

make sure that the students had peace and quiet when filling in the forms. The students completed the survey forms individually and had a whole school lesson to disposal.

The procedure secured anonymity by ensuring that no one in the schools could see the completed survey responses. First of all, participants did not put their names on the forms, and no codes were used to identify individual students. Secondly, students put the filled-in forms in an envelope which was immediately sealed and sent unopened to the HEMIL-centre. The completed forms were then read optically and checked manually in cases of doubt. Finally, the information was transformed to an SPSS data file and screened and cleaned after standard procedures common for all the participating countries in the HBSC-study. The quality check included screening the data for inconsistencies, removing responses from participants that did not state their gender, as well as removing responses from participants with more than 25 percent missing on key variables.

5.3 Ethical considerations

Ethical considerations must always be taken seriously when conducting research with human participants, and especially when dealing with vulnerable groups such as adolescents. The HBSC-study was approved for ethical clearance by the Regional Committee for Research Ethics in Norway, and the Privacy Protection Officer at the University in Bergen. There are nevertheless ethical issues regarding participation in the study. Firstly, participation was based on passive consent from parents, i.e. parents had the opportunity to decline participation in advance for their child(-ren). Secondly, when entire school classes fill in the forms in a lesson there is a degree of social pressure involved. Free participation was however emphasised, by making sure that participants knew they could

withdraw from the study at any point in time during the study, both at school- and student level.

Certain items in the questionnaire might have caused distress for some students, for example questions regarding individual abilities and popularity. However, the societal benefits from such studies are considered to compensate for the discomfort experienced by some students. The knowledge gained from studying adolescent subjective health can expectantly contribute to changes in a positive direction for all adolescents, and especially for those who are most vulnerable. Anonymity was ensured throughout the survey process, which should make students feel safe when completing the questionnaire.

5.4 Instruments

The specific measures used for analysis in this study are demographic measures (gender and school class), the Student Life Satisfaction Scale (SLSS) (Huebner, 1991), an adapted version of the Youth Experience Survey (YES) (Hansen et al., 2003), and two measures concerning frequency, type, and characteristics of the participants' physical activity habits. The Family Affluence Scale (FAS) (Boyce, Torsheim, Currie, & Zambon, 2006; Currie, Elton, Todd, & Platt, 1997) was also used to control for socioeconomic status in relevant analyses. These variables will be described in more detail in the following sections.

5.4.1 Demographic measures

The demographic measures used were adolescents' self-reported gender and school class. In addition, SES was included in specific analyses (see section 5.4.5 below for more details on the SES measure).

5.4.2 Physical activity measures

In the HBSC-survey, physical activity is defined as any activity that makes the participant get short of breath or sweat. Three physical activity items were used and combined in different ways in this thesis. These measures were all developed by the international HBSC-research network (see appendix 1a and 1b for original items).

First of all, a general one-item measure of vigorous physical activity was included, asking how many times per week participants were active: *Outside school hours: How many TIMES a week do you usually do sports or are active to the extent that you get short of breath or sweat?* The response categories were (coding in parenthesis): “every day” (7); “4-6 times a week” (5); “2-3 times a week” (2.5); “once a week” (1); “once a month” (.25); “less than once a month” (0); and “never” (0). The recoding of the values was done in order to better reflect the real frequency of physical activity participation. This way, interval level data were created that better met the assumptions underlying some of the statistical procedures. Consequently, the higher score participants had on this activity measure, the more active they were. Being physically active to the extent that one gets short of breath or sweat on a regular basis several times a week, is from a health promotion perspective more beneficial and preferable than exercising for example three hours once a week.

Second, participants were asked if, and how often they participated in any of 18 activities (*Which of these activities do you usually do in your spare time?*). The activities listed were football, handball, basketball, athletics, karate, wrestling, boxing, weightlifting, gymnastics, dancing, running, aerobics, swimming, cycling, hiking, alpine, ice hockey, and cross-country. These activities were thought to be an assortment of the most common physical activities Norwegian adolescents participate in. Participants were requested to give one response per activity. The response categories were (coding in parenthesis): “don’t do

this activity” (1); “*2-3 times a month or more seldom*” (2); “*about once a week*” (3); and “*two times or more a week*” (4).

This measure was accompanied by a question requesting information about whether the activity was normally carried out in organised settings (*Do you normally do this activity in an organisational setting/sports club?*). The response categories were (coding in parenthesis): “*yes*” (1); and “*no*” (2).

A new physical activity variable with three levels was created, by combining the two items described last in the previous paragraph. Firstly, those who responded that they participated in any of the listed activities, and in addition that they were usually doing the activity in organised settings, were recoded into a group labelled “organised active”. Secondly, participants reporting that they were physically active, yet not in organised settings were put in a group labelled “unorganised active”. And finally, those who did not take part in any of the activities on the list were labelled “inactive”.

5.4.2.1 Reliability and validity, physical activity measures

Physical activity is a complex and multidimensional variable to measure. It is therefore challenging to measure physical activity in a precise and reliable manner within survey designs, and especially when assessing children and adolescents (Boreham & Riddoch, 2001). Nevertheless, the physical activity-measure assessing how many times per week participants were physically active, have been shown to have satisfactory validity and reliability properties (Booth, Okely, Chey, & Bauman, 2001).

The measures requesting information about how often adolescents participated in a set of listed activities, and whether the activity was regularly undertaken in an organised

setting, were new in the most recent HBSC-study. It was pilot tested in Norway in February 2005 and found satisfactory.

5.4.3 Initiative measure

A modified version of the Youth Experience Survey (YES 2.0) was used to assess participants' level of initiative when participating in physical activity. The complete YES-scale has been applied to measure positive and negative developmental experiences in various domains of adolescents' everyday life (Hansen & Larson, 2002; Hansen & Larson, 2005; Larson et al., 2006). Reed Larson has approved the use of the YES-instrument in the HBSC-survey. Larson's concept of initiative has not been measured in Norway before. The HEMIL-centre's research on this topic, including the current thesis, is therefore considered explorative.

The initiative scale in the original YES-instrument consists of four sub-scales: goal setting, effort, problem solving, and time management. The HBSC-study applied a revised version adapted for Norwegian adolescents. Firstly, the questions were translated to Norwegian. It was considered important to use the most precise language possible, to conserve the content and meaning of the original items. A part of the sentence specifying physical activity was therefore added to every of the six items, in order to make the items as precise as possible in relation to the context.

Secondly, the translated version was tested in three focus group interviews among 14 - 15 year-olds in February and September 2005. These interviews were undertaken to gather information about how well the translated items were comprehended by Norwegian adolescents. Focus group interviews are considered useful in both the development and evaluation of questionnaires, because they are informal and produce qualitative data on

participants' experiences and understanding of concepts (Nøtnes, 2001). The HBSC-study applied a free and open structure of the focus group interviews, in line with scientific recommendations (Nøtnes, 2001). The six items of the initiative scale were revised applicably, to match the everyday language of Norwegian adolescents. Guidelines on formulations of questionnaires recommend that items are written in a language that reflects the everyday language of the target group, to facilitate understanding and avoid misinterpretations (Haraldsen, 1999). The initiative-scale was tested during autumn 2005 in a pilot study, including 45 students in two secondary schools. The preliminary alpha values were satisfying.

The items in the initiative-scale intend to refer to domain-specific experiences of initiative. The YES-scale in this study thus consisted of six items following a short introductory text: "*During this school year: How often have you had the following experiences whilst taking part in physical activity?*". The six items that followed were (see appendix 1c for original):

- a. *I put all my energy into the physical activity I do in my spare time.*
- b. *I test and push my limits through physical activity in my spare time.*
- c. *I focus my attention when I do physical activity in my spare time.*
- d. *It is my own decision to take part in physical activity in my spare time.*
- e. *I learn to find ways to achieve my goals when I do physical activity.*
- f. *I organise my day in order to do physical activity in my spare time.*

Three of the questions regards effort experiences (a, b, and c); one question regard goal setting (e); one question regard time management (f); and one question taps into both problem solving and time management aspects (d). The original instrument included three questions for every sub-category.

The response categories on a four-point scale were (coding in parenthesis): “*very often*” (3); “*pretty often*” (2); “*sometimes*” (1); “*not at all*” (0). A new variable was computed for the total score on the initiative-scale. The higher the score, the more initiative did participants experience.

5.4.3.1 Reliability and validity, YES initiative-scale

High internal consistency has been reported in studies using the YES initiative scale, with a Cronbach’s alpha coefficient of .91 (YES 1.0) and .94 (YES 2.0) (Hansen & Larson, 2002; Hansen & Larson, 2005). In the current study, the Cronbach’s alpha coefficient was .85, indicating high internal consistency.

The validity of the initiative part of the YES-scale has been shown to be satisfactory in American studies (Hansen & Larson, 2002; Hansen & Larson, 2005). There are however always challenges when questionnaires are translated from a language to another, because the underlying meaning of the original item may change. In addition, there are cultural issues that must be considered. The item “*It is my own decision to take part in physical activity in my spare time*”, is quite different from the original items. It might be understood as a measure of autonomy and inner motivation, rather than problem-solving and time management. However, a more direct translation of the original item caused confusion among the adolescents in the focus groups, as they did not understand the original question on goal setting in relation to physical activity.

Another aspect in relation to the validity of the initiative-measure, is whether the scale measures aspects relevant for the development of initiative, or if it measures an underlying ability to be focused and determined. More cross-cultural research and further validation of the initiative-construct is needed, to improve the validity of the scale.

5.4.4 Life Satisfaction measure

Self-report scales are the most common technique for measuring life satisfaction. This technique has been consistently supported, in spite of the potential limitation of social desirability issues (Gilman & Huebner, 2003). A translated version of the Student Life Satisfaction Scale (SLSS) was used to measure global life satisfaction in the current study (Huebner, 1991).

The scale consists of nine items designed to evaluate adolescents' life satisfaction on the whole, rather than looking into specific domains (Huebner, 1991). The scale included the following statements (see appendix 1d for original items):

- b) *I like the way things are going for me.*
- c) *My life is going well.*
- d) *My life is just right.*
- e) *I would like to change many things in my life.*
- f) *I wish I had a different kind of life.*
- g) *I have a good life.*
- h) *I feel good about what's happening to me.*
- i) *I have what I want in life.*
- j) *My life is better than most my age.*

Two of the items are negatively worded, and had to be reversely coded prior to analyses. The response categories were on a four-point scale (coding in parenthesis): “never” (0); “sometimes” (1); “often” (2); “almost always” (3). A new variable was computed for the total SLSS-score. The higher score the participants had on this scale, the higher life satisfaction.

The original English version of SLSS was translated to Norwegian by researchers in the Norwegian HBSC-network. The translated version was pilot tested on a sample of Norwegian adolescents, prior to applying it in the HBSC-survey.

5.4.4.1 Reliability and validity, SLSS

High internal consistency has been reported for the original SLSS-scale, with an alpha value of .84 (Huebner, 1991). The scale had a Cronbach's alpha of .90 in the current study, indicating high internal consistency. In addition, the validity features of SLSS have been found to be satisfactory (Dew & Huebner, 1994).

5.4.5 The Socioeconomic Status measure

The Family Affluence Scale (FAS) was included in certain analyses to control for the effect of SES. The FAS is developed by researchers in the HBSC-network (Boyce et al., 2006; Currie et al., 1997). See appendix 1e for original items. The scale is composed of four items (response alternatives in brackets, coding in square brackets):

- a. *Does your family own a car, van, or truck? (No [0], yes, one [1], yes, two or more [3])*
- b. *Do you have your own bedroom for yourself? (No [0], yes [1])*
- c. *During the past 12 months how many times did you travel away on holiday with your family? (Not at all [0], once [1], twice [2], more than twice [3])*
- d. *How many computers do your family own? (None [0], one [1], two [2], more than two [3]).*

A total FAS-score was calculated for each student based on hers/his responses to the four items. The total score ranged from zero to nine, with zero indicating the lowest possible SES, and nine being the highest possible SES.

5.4.5.1 Reliability and validity, FAS

The FAS measure has adequate validity and reliability qualities (cf. Currie et al., 2008).

5.5 Data preparation and steps of analysis

The analytical software SPSS for Windows, version 15.0, was used to perform the statistical analyses. Next follows a presentation of the steps taken to analyse the data:

1. The sample was selected based on which items in the questionnaire participants had responded to. The selected cases were copied into a new dataset and saved for further analyses.
2. Missing data was considered separately for each analysis. This was done because the number of missing responses was very high for two groups of variables ('type of leisure time physical activities' and 'organised vs. unorganised activity'). These variables were transformed in SPSS to reduce the number of missing cases. The number of missing responses in the other measures was acceptably low.
3. The main variables (physical activity frequency, initiative, and life satisfaction) were checked for outliers. Although several respondents reported maximum and minimum scores on these measures, the outliers were not excluded from the data because they were considered to be within a reasonable range.

4. Items that were worded in a certain way to avoid response bias were reversely coded where applicable.
5. All scales were recoded to provide a minimum value of zero.
6. Scales were computed where appropriate, and total scores of scales were calculated.
7. Scale properties were explored and reliability checked by Cronbach's α .
8. Preliminary analysis included frequency distributions and descriptive statistics. Relevant variables were also explored using graphs to check for normality distributions.
9. Independent sample t-tests were performed to check for gender differences. In cases where the variance of the groups was very different according to Levene's test for equality of variance, the compensating t-value was reported.
10. Correlation analyses were performed on the variables that met the following assumptions that underlie a range inferential statistics techniques (Pallant, 2005):
 - Continuous variables (one IV can be dichotomous)
 - Random sampling
 - Related pairs
 - Independence of observations
 - Normal distributions
 - Linearity
 - Homoscedasticity.

Analyses were run on the physical activity frequency-, initiative-, and life satisfaction-variables to test for correlational relationships.

11. Where applicable, variables were transformed and recoded into tertiles, as preparation for ANOVA's.
12. Two-way ANOVA's were performed to check for gender differences within the physical activity groups on initiative and life satisfaction.
13. The relevant variables were checked for the underlying assumptions of regression analysis (Pallant, 2005):
 - Sample size
 - Multicollinearity and singularity
 - Outliers
 - Normality, linearity, homoscedasticity, independence of residuals.
14. Mediation analyses were conducted using multiple regressions to test if initiative functions as a mediator between physical activity and life satisfaction (see section 5.5.1 for details).
15. Relevant variables were centralised, in order to avoid multicollinearity between the predictor variables in regression analyses (Cohen, Cohen, West, & Aiken, 2003). In addition, centralising can provide more meaningful interpretations of the regression coefficients. When variables are centred, the coefficient for one IV, (a), estimates the association between (a) and a DV, (y), when a second IV, (b), equals its average. In the non-centered method, the association between (a) and (y) is estimated, where (b) equals zero. Many social and psychological phenomena do not

have a natural zero point, thus centering the predictors is reasonable in order to interpret the results in a meaningful way (Cohen et al., 2003).

16. Several hierarchical regression analyses were performed to test for interaction effects.

Only variables that met the assumptions underlying the statistical techniques were included in analyses.

5.5.1 Mediation analysis

The main analysis performed in this study was a series of regression analyses, exploring the relationship between physical activity, initiative and life satisfaction. A main aim was to test the model where initiative is hypothesised to act as a mediator in the relationship between physical activity and life satisfaction. The underlying principles for mediation analyses are presented next.

The most commonly used method for testing mediation effects in psychological research is that developed by Baron and Kenny (1986) (MacKinnon, Fairchild, & Fritz, 2007). The mediation model is used to specify how and why three variables are related. In this study, it was theorised that initiative may function as a mediator that accounts for some of the relation between physical activity and life satisfaction. This three-variable system assumes two causal paths feeding into the outcome variable of life satisfaction: the direct impact of the independent variable physical activity, and the impact of the mediator variable initiative, as well as a path from physical activity to initiative (see Figure 2) (Baron & Kenny, 1986).

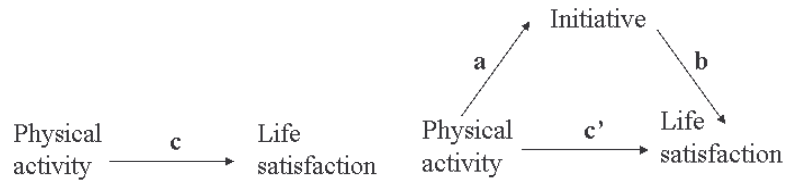


Figure 2. Diagrams of paths in the mediation model, where initiative mediates the link between physical activity and life satisfaction

Four steps, performed with three regression equations, must be followed to establish mediation (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004; MacKinnon et al., 2007; MacKinnon, Lockwood, Hoffmann, West, & Sheets, 2002; Preacher, 2004):

1. The predictor must correlate with the criterion (estimates and tests path c in Figure 2).
2. The predictor must correlate with the mediator (estimates and test path a in Figure 2).
3. The mediator must affect the criterion variable (estimates and tests path b). It is important that the mediator is not merely correlated with the criterion variable at this stage.
4. The predictor must be controlled for in establishing the effect of the mediator on the criterion. The effect of the predictor on the criterion variable should be zero when controlling for the mediator (path c'), if initiative completely mediates the relationship between physical activity and life satisfaction. However, when testing psychological constructs it is more plausible to expect a partial mediation, where the effect of the predictor on the criterion is significantly reduced when controlling for the mediator, rather than (c') equalling to zero.

6.0 Results

One aim of this thesis was to describe the sample thoroughly, in terms of adolescents' physical activity habits and associations with initiative and life satisfaction. Sections 6.1 to 6.3.3 therefore present preliminary descriptive statistics, independent sample t-tests, correlations, and two-way between groups ANOVA's, to describe and compare individuals and groups within the sample.

Sections 6.4 and 6.5 include mediation- and moderation analyses, to test the proposed models of interrelationships between physical activity, initiative, and life satisfaction, as well as interaction effects of SES.

Given the large sample size, a more rigid alpha level was employed for all significance tests, i.e. $p < .01$.

6.1 Descriptive statistics

The descriptive statistics are presented in Table 1 below, and are extended in more detail in the following sections, 6.1.1 to 6.1.3.

Table 1. Distributions of physical activity-, initiative-, and life satisfaction scores, across gender

	<i>All</i>			<i>Girls</i>			<i>Boys</i>			<i>t^a</i> <i>(η²)</i>
	<i>n</i>	<i>Mean</i> <i>(SD)</i>	<i>Skewness/</i> <i>Kurtosis</i>	<i>n</i>	<i>Mean</i> <i>(SD)</i>	<i>Skewness/</i> <i>Kurtosis</i>	<i>n</i>	<i>Mean</i> <i>(SD)</i>	<i>Skewness/</i> <i>Kurtosis</i>	
Physical activity	1518	3.18 (2.12)	.26/ -.99	711	2.82 (1.95)	.41/ -.71	807	3.50 (2.22)	.09/ -1.15	6.44* ^b (.03)
Initiative	1408	1.80 (.72)	-.20/ -.55	661	1.71 (.71)	-.11/ -.59	747	1.87 (.73)	-.29/ -.47	3.96* (.01)
Life satisfaction	1414	1.96 (.65)	-.59/ -.34	662	1.84 (.66)	-.43/ -.67	752	2.07 (.61)	-.74/ .10	6.98* ^b (.03)

NOTE:

^a t-value from independent samples t-tests

^b equal variances not assumed

η² = eta squared

* p < .001

Physical activity, measured as times per week of moderate to vigorous physical activity

Initiative, as measured by YES (Hansen & Larson, 2005)

Life satisfaction, as measured by SLSS (Huebner, 1991)

The effect sizes of the differences were demonstrated by calculating an eta squared value, ranging from zero to one. Eta squared signifies the amount of variance in the dependent variable explained by the independent variable (Pallant, 2005). The eta squared value for independent sample t-tests are calculated using the following formulae:

$$\frac{t^2}{t^2 + (N1 + N2 - 2)}$$

. Cohen (1988, in Pallant, 2005) has suggested that effect sizes less than

.05 are considered small, effect sizes between .06 and .13 can be regarded as moderate, and effect sizes above .14 are large.

Regarding the normality distribution of the variables, deviation from zero does not play a significant role when the sample size is large, as was the case in the current study (Tabachnick & Fidell, 2006). Thus, although the scores diverged slightly from the normal curve, it should not have implications for the further multivariate analyses conducted.

In cases where Levene's test of equality of variance was significant (i.e. p < .05), the t-value accounting for unequal variance in the groups were reported.

6.1.1 Physical activity

The average frequency of participation in physical activity, to the extent that the adolescents reported that they get out of breath or sweat, was 3.18 times a week (see Table 1). The range was large, going from zero to seven times a week. Boys had a significantly higher activity level than girls. The effect size was however small, indicating small practical differences. The distribution of scores in the frequency measure of physical activity was slightly positively skewed and had a small negative kurtosis. This should however not violate the assumptions underlying the statistical analyses performed further on, because of the large sample size (Tabachnick & Fidell, 2006).

Table 2. Frequencies of physical activity across three physical activity groups and gender

	<i>All</i>		<i>Boys</i>		<i>Girls</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Inactive	62	4	28	3.4	34	4.7
Unorganised active	520	33.9	270	33.1	250	34.8
Organised active	895	58.3	480	58.9	415	57.7

NOTE:

N = 1477 for all participants, n = 778 for boys, and n = 699 for girls

When considering the adolescents' broader activity profile (see Table 2), almost 60 percent reported that they were physically active in an organised setting. About 34 percent were active, but not in organised settings, and four percent of the adolescents were inactive. Both active groups included a larger proportion of boys compared to girls, whereas girls were the majority in the inactive group.

6.1.2 Initiative

On a scale from 0 – 3, with a score of three indicating high levels of initiative, the average score was 1.80 (see Table 1). Boys scored significantly higher than girls, but the magnitude

of the difference had little practical impact because of the low eta squared value. This indicates that the association between initiative and gender was limited. The normality curve for the initiative measure tilted slightly to the right, and was a little flat.

6.1.3 Life satisfaction

The mean score on the life satisfaction measure was 1.96, on a range from zero to three (see Table 1). Boys scored significantly higher than girls, yet the difference had limited practical impact because of the low eta squared value. The distribution of life satisfaction scores had a negative skew, and the normality curve was a little flat.

6.2 Correlations among main variables

Table 3 demonstrates the correlational associations between the main variables in the study.

Table 3. Pearson product-moment correlations between key variables

	<i>Life satisfaction</i>			<i>Initiative</i>		
	<i>All</i>	<i>Girls</i>	<i>Boys</i>	<i>All</i>	<i>Girls</i>	<i>Boys</i>
Physical activity	.23*	.16*	.24*	.59*	.58*	.58*
Initiative	.28*	.26*	.27*			

NOTE:

p < .01 (two-tailed)

Physical activity, measured as times per week of moderate to vigorous physical activity

Initiative, as measured by YES (Hansen & Larson, 2005)

Life satisfaction, as measured by SLSS (Huebner, 1991)

The relationships were investigated using Pearson product-moment correlation coefficients. To determine the strengths of the associations, the following guidelines were applied: First, $r = \pm .10$ to $\pm .29$ indicates a weak relationship, second $r = \pm .30$ to $\pm .49$ indicates a medium relationship, and third, $r = \pm .50$ to ± 1 signifies a strong relationship

between the variables (Cohen, 1988). When looking at the whole sample, life satisfaction was weakly positively related to physical activity and initiative, whereas physical activity was strongly positively correlated with initiative. Next, when evaluating the correlates by gender, the main difference was found in the association between physical activity and life satisfaction. Although the correlations for both genders were modest, boys had a stronger association between physical activity and life satisfaction than girls. The other associations were almost identical for both genders.

6.3 ANOVA-results

The following sections present a series of two-way, between-groups ANOVA's. They were performed to investigate differences in the physical activity groups on initiative and life satisfaction, as well as gender variations within the physical activity groups.

The sample sizes in the three activity groups were very different ($n = 62$ in the inactive group; $n = 520$ in the active, unorganised group; and $n = 895$ in the organised active group). Therefore, the Hochberg's GT2 post hoc test was used (Connolly, 2007). In analyses where the assumption of homogeneity of variance was violated, the Welsh and Brown-Forsythe tests were consulted in addition to the F-statistic, to avoid Type 1 error (Pallant, 2005). Effect sizes of the group differences were reported using eta squared.

Pallant (2005) recommended that a more rigorous significance level ($p < .05$) was set for the ANOVA when the Levene's test of error variance was significant, as was the case in the current analyses. Table 4 gives the descriptive statistics relevant for the two-way analyses.

Table 4. Descriptive statistics, two-way ANOVA's: impact of gender and physical activity group on frequency of physical activity, initiative, and life satisfaction

		<i>Physical activity</i>		<i>Initiative</i>		<i>Life satisfaction</i>	
		<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>
		(<i>SD</i>)		(<i>SD</i>)		(<i>SD</i>)	
	Inactive	1.37 (1.83)	27	1.17 (.68)	26	2.05 (.59)	26
Boys	Unorganised active	2.49 (2.10)	269	1.57 (.70)	248	1.96 (.65)	253
	Organised active	4.27 (1.93)	476	2.10 (.63)	450	2.15 (.58)	443
	Inactive	0.93 (1.91)	34	.82 (.61)	29	1.65 (.65)	32
Girls	Unorganised active	2.04 (1.84)	248	1.45 (.65)	229	1.68 (.70)	224
	Organised active	3.47 (1.69)	410	1.95 (.63)	394	1.94 (.62)	388

NOTE:

Physical activity, as times per week of moderate to vigorous physical activity

Initiative, as measured by YES (Hansen & Larson, 2005)

Life satisfaction, as measured by SLSS (Huebner, 1991)

6.3.1 Group differences in frequency of physical activity participation

Two measures of physical activity were used to capture group differences in frequency of physical activity participation. The first measure evaluated adolescents' moderate to vigorous activity by requesting the frequency of weekly participating to the extent that they got out of breath or sweat. The second measure, the grouping variable described in previous sections (see section 5.4.2), accounted for the general structure of the physical activity (i.e. whether the participants were organised active, unorganised active or inactive). Combining the two measures provided an overall activity profile of participants. In addition, the combination of these measures validated the more general physical activity variable, and indicated that the three activity groups captured the intended elements. However, as can be seen in Table 5, about half of the participants in the inactive group reported that they were

active several times a week, and a small proportion of the organised and unorganised active participants reported that they were hardly ever active. These findings are due to methodological constraints when measuring physical activity behaviours, and must be taken in consideration when interpreting the further results.

The crosstab summary in Table 5, including the two physical activity measures, was produced to get a descriptive overview of the frequency of participation in the three groups. The table demonstrates that the organised active group had the highest frequency of activity, followed by the active group. Expectedly, the inactive group had the lowest activity frequency.

Table 5. Frequency of moderate to vigorous physical activity, by physical activity group and gender

	<i>Inactive</i>						<i>Unorganised Active</i>						<i>Organised Active</i>					
	<i>All</i>		<i>Boys</i>		<i>Girls</i>		<i>All</i>		<i>Boys</i>		<i>Girls</i>		<i>All</i>		<i>Boys</i>		<i>Girls</i>	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
< once a month/never	32	2.2	10	1.3	22	3.2	80	5.5	38	4.9	42	6.1	7	.5	4	.5	3	.4
Once a month	5	.3	2	.3	3	.4	28	1.9	16	2.1	12	1.7	13	.9	6	.8	7	1
Once a week	9	.6	7	.9	2	.3	123	8.4	56	7.3	67	9.7	72	4.9	31	4	41	5.9
2-3 times/week	9	.6	5	.6	4	.6	182	12.4	92	11.9	90	13	329	22.5	145	18.8	184	26.6
4-6 times/wk	3	.2	2	.3	1	.1	68	4.6	44	5.7	24	3.5	348	13.8	196	25.4	152	22
Every day	3	.2	1	.1	2	.3	36	2.5	23	3	13	1.9	117	8	94	12.2	23	3.3
Total	61	4.2	27	3.5	34	4.9	517	35.3	269	34.8	248	35.8	886	60.5	476	61.7	410	59.2

NOTE:

n = 1464 for the whole sample, n = 772 for boys , and n = 692 for girls

A two-way ANOVA was then performed, to investigate how the level of moderate to vigorous physical activity varied between the three physical activity groups. Gender was also included in this analysis, to investigate the extent to which the genders differed within the physical activity groups. Figure 3 illustrates the difference between the activity groups, as well as gender variations within the groups, in terms of frequency of physical activity.

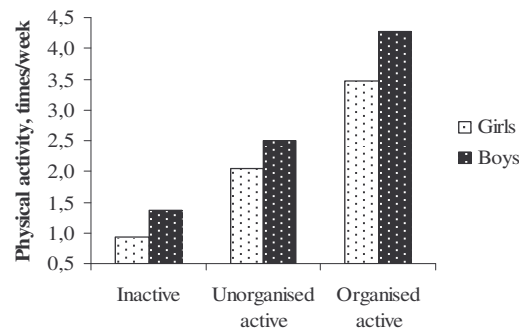


Figure 3. Differences in moderate to vigorous physical activity between the physical activity groups, including gender variations

The analysis disclosed significant main effects for both physical activity group [$F(2, 1464) = 155.18, p < .001$], and gender [$F(1, 1464) = 10.23, p < .001$]. The power of the main effects did however vary dramatically in size: the effect size of gender was less than .01, whereas physical activity group differences had an effect size of .18, indicating large differences. Post hoc comparison revealed large differences within all three physical activity groups.

6.3.2 Group differences in initiative experiences

A second two-way ANOVA was performed, to explore the impact of gender and physical activity profile on initiative. Figure 4 illustrates the physical activity group-, and gender differences, in initiative.

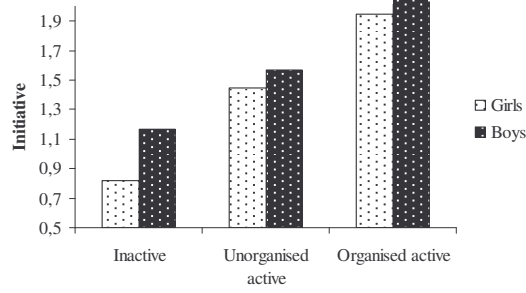


Figure 4. Differences in initiative between the physical activity groups, including gender variation

A significant main effect was found for gender [$F(1, 1370) = 1.76, p < .001$] and activity group [$F(2, 1370) = 139.62, p < .001$]. The effect size for activity group was large ($\eta^2 = .17$) indicating considerable group differences. Gender, on the contrary, had a small effect size ($\eta^2 = .01$). Post hoc tests disclosed significant differences between all three physical activity groups. Table 4 provides the relevant descriptive statistics. The interaction effect [$F(2, 1370) = .80, p = .45$] did not reach a level of statistical significance.

6.3.3 Group differences in life satisfaction

Some evidence was found of a relationship between life satisfaction and physical activity profile. Figure 5 depicts the physical activity group differences, as well as gender variations, in life satisfaction.

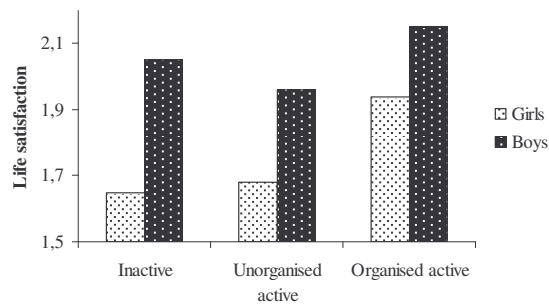


Figure 5. Differences in life satisfaction between the physical activity groups, including gender variations

The two-way ANOVA revealed a statistically significant main effect for gender [$F(1, 1360) = 24.35, p < .001$], and activity profile [$F(2, 1360) = 19.35, p < .001$]. Post hoc comparison demonstrated that the organised active group differed significantly from both the unorganised active, and the inactive groups, whereas the two latter groups did not differ remarkably (see Table 4 for means and standard deviations). The effect size for gender and activity group was small ($\eta^2 = .02$, and $\eta^2 = .03$ respectively), indicating relatively small practical implications. The interaction effect [$F(2, 1366) = .93, p = .394$] did not reach statistical significance.

6.4 Mediation effects

Table 6 contains the analyses necessary to examine the mediational hypothesis, as outlined by Baron and Kenny (1986).

Table 6. Testing the mediating effect of initiative on the relationship between physical activity and life satisfaction using multiple regression

<i>Testing steps in mediation model</i>	<i>All</i>				<i>Girls</i>				<i>Boys</i>			
	<i>B (SE)</i>	<i>95 % CI</i>	<i>β</i>	<i>R²</i>	<i>B (SE)</i>	<i>95 % CI</i>	<i>β</i>	<i>R²</i>	<i>B (SE)</i>	<i>95 % CI</i>	<i>β</i>	<i>R²</i>
Testing step 1 (Path c), Outcome: Life satisfaction												
Predictor: Physical activity	.07 (.01)	.05, .09	.23*	.05	.06 (.01)	.03, .08	.16*	.03	.07 (.01)	.05, .09	.24*	.06
Testing step 2 (Path a), Outcome: Initiative												
Predictor: Physical activity	.20 (.01)	.19, .21	.59*	.34	.21 (.01)	.19, .23	.58*	.34	.19 (.01)	.17, .21	.58*	.34
Testing step 3 & 4 (Paths b and c'), Outcome: Life satisfaction												
Mediator: Initiative	.20 (.03)	.14, .26	.22*		.23 (.04)	.15, .32	.25*		.17 (.04)	.10, .24	.20*	
Predictor: Physical activity	.03 (.01)	.01, .05	.10*	.08a	.01 (.02)	-.03, .04	.02	.07a	.03 (.01)	.01, .06	.12*	.08 ^a

NOTE:

CI = confidence interval

* p < .01

^a = adjusted R² when > two variables are included in the model

First of all, it was established that physical activity was related to life satisfaction, satisfying the requirement in Step 1 of the mediation model. Next, physical activity was regressed on initiative (path a), establishing a significant relation between the variables and confirming step 2 in the mediation outline. Life satisfaction was then regressed simultaneously on both initiative and physical activity, testing path b and c'. A significant relation between initiative and life satisfaction was found, thus the requirement for Step 3 was met. This third regression equation also provided an estimate of the relation between physical activity and life satisfaction, controlling for initiative (path c'). When path c' is zero there is complete mediation. However, in this case path c' was .10 and still significant at $p < .05$ level. It was nevertheless smaller than path c, which was .23, indicating partial mediation. Figure 6 illustrates the mediation model with the corresponding β -values.

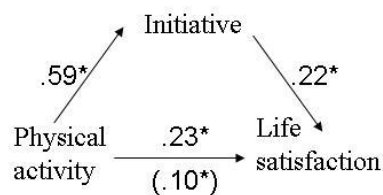


Figure 6. The partially mediated relationship between physical activity, initiative, and life satisfaction, whole sample included in analysis, β -values, * $p < .01$

The online calculation tool MedGraph was applied to test whether the drop from .23 to .10 was significant, (Jose, 2003). This calculation tool presents information about the type of mediation (whether there is full, partial or none mediation), in addition to the Sobel-test result. The Sobel-test examines the significance of the indirect effect of the predictor on the output variable via the mediator (Baron & Kenny, 1986). MedGraph demonstrated that the drop from .23 to .10 was significant (Sobel z-value = 6.32, $p < 0.001$), thus confirming that initiative functions as a partial mediator between physical activity and life satisfaction.

Initiative thus partially mediated the relationship between physical activity and life satisfaction for the whole sample. In this case 56 percent of the effect of physical activity on life satisfaction went through initiative (.10) and 43 percent of the effect was direct (.13).

6.4.1 Mediation results, girls

All the three steps required for the mediation model to be valid were fulfilled for girls (see Table 6). The third step in the mediation outline, where life satisfaction was regressed on both initiative and physical activity, revealed that the effect of physical activity on life satisfaction was close to zero and not significant when controlling for initiative. Subsequent tests using MedGraph verified that initiative fully mediated the relationship between physical activity and life satisfaction for girls (Sobel z-value = 1.97, $p < 0.05$). Figure 7 shows the β -values and the drop of the direct influence of physical activity on life satisfaction.

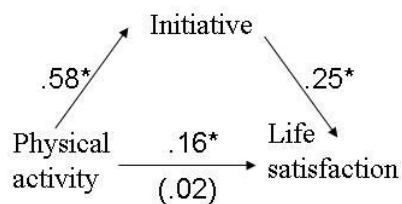


Figure 7. The fully mediated relationship between physical activity, initiative, and life satisfaction for girls, β -values, * $p < .01$

In fact, 87.5 percent of the effect of physical activity on life satisfaction went through initiative for girls in this sample.

6.4.2 Mediation results, boys

As for the girls, Steps 1 – 3 in the mediation outline were satisfied for boys (see Table 6).

Figure 8 illustrates the relationship between the variables.

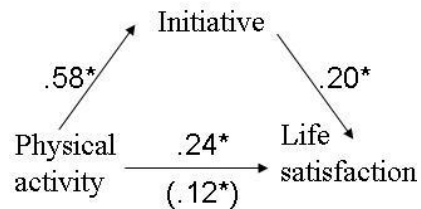


Figure 8. The partially mediated relationship between physical activity, initiative, and life satisfaction for boys, β -values, * $p < .01$

The third regression equation, where life satisfaction was regressed on both initiative and physical activity, did however demonstrate that Path c' was significant, yet smaller than Path c. Further examination using MedGraph, showed evidence of a partial mediation (Sobel z-value = 4.15, $p < 0.001$). About half of the effect of physical activity on life satisfaction went through initiative for boys, whereas the other half was explained by the direct effect. These results indicate that initiative functioned as a partial mediator in the relationship between physical activity and life satisfaction for boys.

6.5 Moderation effects

No significant interactions were found when investigating the main variables for moderating effects of SES (see Table 7).

Table 7. Testing moderator effects of SES on the relationships between physical activity and initiative/ life satisfaction, using hierarchical multiple regression

<i>Step and variable</i>	<i>B</i>	<i>SE B</i>	<i>95 % CI</i>	β	R^2
Model 1: SES moderating PA → life satisfaction relationship					
Step 1					
SES	.06	.01	.04, .08	.16*	
PA	.06	.01	.05, .08	.20*	.07*
Step 2					
SES x PA	-.01	.01	-.02, .00	-.05	n.s. ^a
Model 2: SES moderating PA → initiative relationship					
Step 1					
SES	.04	.01	.02, .06	.08*	
PA	.20	.01	.18, .21	.58*	.35*
Step 2					
PA x SES	.00	.00	-.01, .01	-.00	n.s. ^a
Model 3: SES moderating initiative → life satisfaction					
Step 1					
SES	.06	.01	.04, .08	.14*	
Initiative	.23	.02	.18, .28	.26*	.10*
Step 2					
SES x initiative	.02	.01	-.01, .04	.03	n.s. ^a

NOTE:

CI = confidence interval

PA = physical activity measured in times per week of moderate to vigorous physical activity

SES = socioeconomic status measured by FAS

* $p < .05$

n.s. = not significant

^a = R^2 change

7.0 Discussion

This thesis investigated the nature of the association between adolescents' initiative experiences in physical activity, and life satisfaction. The overall results substantiate the theoretical assumptions and previous research findings of the relationship between involvement in organised physical activity and positive adolescent outcomes. The following paragraphs will elaborate on, and discuss the findings.

7.1 Summary of results ~ main findings

This section will provide a brief overview of the main findings in the current study. The results affirmed the research questions by demonstrating that:

1. The main variables in the study, physical activity, initiative, and life satisfaction, were positively related with each other.
2. There were significant, albeit modest gender differences within the variables, with boys scoring higher on all measures.
3. A majority of the adolescents participated in regular, organised physical activity.
4. There were large, significant differences in frequency of activity among the three physical activity groups. The organised active were significantly more active than the unorganised active, and the inactive were as expected the least active.
5. The organised active had significantly more experiences of initiative in contrast to the comparison groups.
6. The organised active had significantly higher life satisfaction than the comparison groups.
7. There was a dose-response relationship between participation in physical activity and initiative experiences.

8. The mediation analyses revealed that initiative fully mediated the relationship between physical activity and life satisfaction for girls, whereas partial mediation effects were found for boys, and the entire sample combined.
9. There were no significant interaction effects of SES.

7.2 Organised active adolescents are more frequently active

Organised physical activities were in this thesis understood as activities that are normally carried out in a sports club, or a structured setting. Such activities are characterised by voluntary participation, an emphasis on skill- and competence-development, and structure in the form of regular scheduled meetings, as well as supervision by adults (Larson, 2000).

A majority of the 15 year-olds in this sample were regularly physically active in an organised setting. Furthermore, about a third reported that they were physically active, but not in organised forms, whereas a minority (only four percent) did not participate in any of the activities listed in the HBSC-questionnaire. Both physically active groups included a slightly larger proportion of boys compared to girls, whereas girls were the majority in the inactive group.

Previous findings on gender differences in physical activity participation, demonstrate that boys are generally more active than girls (Torsheim et al., 2004; Livingstone et al., 2003; Larson & Verma, 1999; Steptoe & Butler, 1996), and that girls to a greater extent than boys exercise on their own (Øia & Bakken, 2002). The current study however, revealed minor discrepancy between the genders' leisure time physical activity, indicating that girls may be more actively involved in physical activity than before. Traditionally, physical activity has been a male dominated arena, with competitive sports as a symbol of masculine identity development (Messner, 2006). The traditional gender roles

are however changing in the Norwegian society, and – as evident from the current research – girls seem to approach boys' physical activity level. This finding is in line with previous research, indicating that physical activity participation among girls is higher in countries with high equality between the genders (Wold & Hendry, 1998). However, the current study did not look into gender differences regarding which activities the adolescents participated in.

The average frequency of participation in moderate to vigorous physical activity was just over three times a week for the 15 year-olds in this study. Moderate to vigorous physical activity was measured by a “sweat- and out of breath-measure”; an indicator of physical activity that is enhancing physical health, because the body's resting level is surpassed (Bouchard et al., 1994). When examining the adolescents' physical activity habits further, large group differences were found in the quantity of health promoting physical activity. First of all, the organised active group had the highest activity level, with an average of nearly four times a week. Secondly, adolescents in the unorganised active group were active typically just under three times a week, and finally, the inactive group was active just above once a week in their leisure time.

These findings indicate that a relatively large proportion of the 15 year-olds in Norway are physically active several times a week, to the extent that it has positive consequences for their health. However, the Norwegian governmental recommendations for physical activity in adolescence – 60 minutes of moderate to vigorous intensity every day (Departementene, 2005) – were only met by a fraction of the participants in this study. Nevertheless, adolescents in the organised active group were most frequently active, and are thus more likely to attain the physical health benefits from such participation. In addition – and more central to the perspective of this thesis – the organised active adolescents have significantly more frequent opportunities to learn important life skills, and

attain valuable competencies and feelings of coping, which is thought to promote positive functioning (Biddle & Mutrie, 2001). It is not surprising that the organised active adolescents were more frequently active, considering that they are more likely to have regular, scheduled meetings for exercise classes, on top of the occasional activities many young people undertake in their leisure time. The next sections will have a more in depth discussion of the developmental advantages of organised physical activity participation.

7.3 Organised active adolescents experience more initiative

As pointed out in the previous paragraph, the majority of adolescents in this study took part in organised activities in their leisure time. These adolescents also reported substantially more frequent experiences of initiative whilst taking part in physical activity, compared to their peers who were unorganised physically active, or inactive. Although boys in all groups reported more initiative experiences than girls, the effect size of the difference was very small, indicating that the gender distinction has limited practical significance.

The findings above are in line with previous work on initiative experiences among adolescents in North-America, which demonstrate that organised activities provide superior opportunities for adolescents to develop their initiative skills, compared to other settings such as in school, or whilst hanging out with friends (Larson et al., 2006; Larson, Hansen et al., 2005; Dworkin et al., 2003; Hansen et al., 2003). This thesis thus verifies previous work, demonstrating that adolescents who are involved in organised physical activities have more frequent experiences of putting down effort, solving problems, setting goals, and managing their time effectively – compared to their peers. Moreover, the current study adds to previous research by revealing that there are differences in initiative experiences within the same leisure activity domain; between those who take part in organised physical activity

and those who do not. Earlier studies have typically compared growth experiences across different types of activities, or developmental processes in organised activities versus school setting or being with friends (Hansen & Larson, 2007; Larson et al., 2006). The finding from this study thus strengthens Larson and colleagues' argument; whereby the structure of the activity is considered important for positive development, not the mere activity by itself.

In general, physical activities are characterised by many of the elements that are considered important for initiative development, such as exerting efforts, working towards a goal, and planning strategies for reaching the goal. Organised physical activity has indeed been found to provide more of the experiences that are conducive for initiative development, compared to other organised activities (Larson et al., 2006). Additionally, physical activity is characterised by an emphasis on challenge, and achievement of results. The adolescents' perceived performance and competence is therefore likely to influence their personal experience in the activity.

It has been suggested that adolescents' way of perceiving their own level of competence is important, in terms of their wellbeing and development in organised physical activity (Duda & Ntoumanis, 2005). The achievement goal theory proposes that there are two main conducts of ability judgement: task- and ego-orientations (Duda & Ntoumanis, 2005). Task-oriented judgements emphasise competence and personal improvement as important to achievement. Conversely, ego-oriented judgements accentuate superior performance in comparison with others. The achievement goal theory further theorises that task achievement goals are more likely to lead to adaptive performance in physical activity – such as putting forth adequate effort, sustaining participation, and optimising performance in line with one's abilities – whether it being in a practice, or competition settings (Duda & Ntoumanis, 2005). These abilities, which may emanate from a task-oriented motivational

climate, correspond well to the skills that are considered important for being able to plan an action, and carry out an initiative (Larson, 2000).

May it be that adolescents who take part in organised activities experience a more task-oriented climate compared to the unorganised, and therefore experience more initiative? Adolescents' achievement orientation depends partly on their individual tendency to behave in a certain manner. However, it also depends on the motivational climate of the surroundings (Duda & Ntoumanis, 2005). Advocates of the achievement goal theory emphasise that interventions that promote a task-oriented motivational climate, will facilitate development of adaptive coping- and reaction patterns in adolescents (Duda & Ntoumanis, 2005). Adult leaders in organised physical activities thus have a great responsibility to balance the right amount of structure and challenging tasks, and at the same time promote a task-oriented climate and allow self-determined behaviours (Larson, 2000). Moreover, it has been emphasised that adult leaders in organised activities should aim at helping the youth teach themselves, rather than teaching them directly (Dworkin et al., 2003). Therefore, in line with achievement goal theory, Larson recommends a task-oriented motivational climate which facilitates adolescents' development of individual skills, over an ego-oriented, competitive atmosphere with a focus on recognition and winning (Larson, 2000). A task-oriented climate promotes efforts and perseverance 'when the going gets tough', and thus further promotes individual development and growth experiences, over time.

Although adult leadership was not included as a variable in the current study, it can be assumed that most organised physical activities are adult-led. Adult leadership has been identified as a significant contributor to initiative development in physical activity (Schistad & Bergstøl, 2007). Hence, the guidance and support provided by adult leaders may be an important factor that facilitates initiative development. Interactions between adults and

adolescents in organised activities are valuable, because adolescents are able to function at higher cognitive and rational levels when assisted by adults (Larson, Hansen et al., 2005). Research from the field of linguistics has demonstrated that adolescents in organised activities acquired and adapted what Larson labelled a “language of agency” (Larson, 2000, p. 176). In joint activities with adults as well as peers, adolescents learned to forecast, plan, adapt to others, supervise development, and adjust their own behaviour over time, in order to reach a goal. The researchers observed an increased use of contingencies and probabilistic thinking in the adolescents’ language, and understood this development as a sign of agency and initiative (Heath, 1994, in Larson, 2000; 1999; Heath & Langman, 1994). Adolescents who are physically active in their leisure time, yet not in organised settings, are less likely to experience such valuable interactions with adults. As adolescents grow into adulthood, less time is spent with parents or caregivers who are normally the main role models. Organised activities thus create a window of opportunities for adolescents to continue the learning and interaction with positive adults, in the absence of parents. Adolescents who do not take part in organised activities may receive less feedback and assistance from adult role models. They may thus miss out on important developmental achievements, such as initiative development.

The theoretical framework in this thesis suggested that satisfaction of the needs for autonomy, competence, and relatedness in physical activity, will foster intrinsic motivation, and provide a safe environment that facilitates positive development (Ryan & Deci, 2000). Previous research on initiative experiences in physical activity, found that all three needs correlated positively with experiences of initiative. The need for competence was the strongest predictor of initiative (Schistad & Bergstøl, 2007). It is not surprising that feeling competent is an important factor in initiative development, considering that initiative ultimately concerns wanting to do something, followed by efforts exerted over time in order

to work towards reaching the set goal. Having the feeling of being competent to carry out such an action plan is therefore necessary. Such theorising is in line with Bandura's concept of self-efficacy. Self-efficacy refers to a person's expectancies that he or she is capable of coping and producing desired outcomes (Bandura, 1997). It is more fun and rewarding to strive for something, when feeling competent and self-efficacious. Thus, it seems that adolescents who are competent both in the motor skills necessary to master physical activity, but who also master the cognitive elements necessary to plan and understand the activity, have more positive, developmental experiences in physical activities.

To summarise, participants who were physically active in organised settings had significantly more initiative experience compared to those who were physically active, yet not in a sports club or organised team. Adolescents who did not take part in any of the physical activities naturally reported significantly fewer experiences related to initiative in physical activity, than the two other groups of adolescents. These findings indicate that being physically active per se is important in relation to initiative experiences, yet organised settings seem to provide adolescents with more frequent experiences of the elements important for the development of initiative. The large power found in the current analyses demonstrated that the differences between the groups were of a considerable size, which may have practical implications.

7.4 The more physical activity the more initiative

It was assumed that the more physically active adolescents would experience more initiative. The results supported this assumption, and thus corroborated a previous finding which revealed that the more hours adolescents spent in an organised activity, the more positive developmental experiences did they have (Hansen & Larson, 2007). There was a

strong, positive correlation between frequency of physical activity and initiative experiences in physical activity. The items in the initiative scale concern issues regarding exertion and concentration, problem solving, goal setting, and time management – elements that are highly present in physical activity, and especially organised physical activity. It is therefore not surprising that the more often adolescents are involved in physical activity, the more of the abovementioned experiences do they have.

Moreover, it is reasonable to presume that the more time adolescents spend in an activity, the better the outcome. Therefore, in addition to more frequent developmental experiences, the organised active adolescents probably experience more continuity in those experiences, compared to those who are active in unorganised settings. Organised activities generally arrange practices two to three times a week, in addition to possible competitions. As seen in preceding paragraphs, the organised active adolescents were more frequently active than those in the comparison groups. They thus have more regular opportunities to experience the elements required for initiative to develop.

7.5 Organised active adolescents have higher life satisfaction

It was assumed that adolescents who were actively involved in organised physical activities would have higher life satisfaction compared to their peers. The results revealed that adolescents in the organised active group reported significantly, albeit modest, higher life satisfaction compared to the unorganised active and the inactive adolescents. Adolescents in the latter groups had similar levels of life satisfaction. The power impact of physical activity on life satisfaction was however very small, indicating that the real difference between the physical activity groups was marginal. However, the findings may imply that being in an organised setting facilitates satisfaction of elements that are of importance for adolescents' life satisfaction.

Physical activity participation has in previous research been associated with increased life satisfaction among adolescents (cf. Biddle & Mutrie, 2001, Biddle, Gorely, & Stensel, 2004). This study substantiates such findings, by demonstrating a positive, although weak, correlation between physical activity and life satisfaction. In addition, the current study verifies that organised physical activity stands out as especially conducive for adolescents' well-being. Organised activity participation, such as physical activity, are associated with a range of positive developmental outcomes, for example improved and prolonged educational achievements, decreased antisocial behaviour, and increased and improved psychological competencies and well-being (cf. Mahoney et al., 2005). Why is it that organised contexts, such as organised physical activity, is salient for adolescents' life satisfaction relative to unorganised physical activity and inactivity?

SDT proposes that intrinsic motivation is a key contributor to well-being and life satisfaction, and that experiences of the three psychological needs are necessary for intrinsic motivation to be developed and maintained (Ryan & Deci, 2007). Adolescents' participation in physical activity is by and large intrinsically motivated (Bagøien & Halvari, 2005). Moreover, intrinsic motivation is an important factor for maintaining participation over time (Ryan et al., 1997). The age period between 13 and 18 years has the greatest decline in physical activity participation (Sallis, 2000). A longitudinal study from the Netherlands, found that withdrawal from physical activity was greatest among participants in unorganised activities, whereas organised activities became a relatively more salient contributor to adolescents weekly physical activity (van Mechelen, Twisk, Post, Snel, & Kemper, 2000). Therefore, the adolescents which are still involved in organised physical activity at the age of 15 can be assumed to be intrinsically motivated, as they participate out of free will because they experience fun, enjoyment, and interest in the activity. Indeed, Bagøien and Halvari found that physical activity participation and intrinsic motivation was

strongly correlated among Norwegian 16 year-olds (Bagøien & Halvari, 2005). The positive experiences from intrinsically motivated behaviour may thus explain why the organised adolescents in this study had slightly higher life satisfaction, than those who were not organised, or inactive. Adolescents in organised activities are also more likely to have additional opportunities to receive constructive feedback from adult leaders. Supportive behaviour and constructive feedback from significant others, such as coaches in an organised activity setting, are thought to lead to increased perceived competence and control, and in turn increased intrinsic motivation (Hein & Koka, 2007).

Moreover, adolescents in organised activities may have more "flow" experiences, because the structure of the activity provides more optimal challenges than just playing around with friends for fun. To experience "flow", there must be a fine balance between the skills and competencies of the participant, and the demands of the activity (Csikszentmihalyi, 1990). Adult-led activities may offer more appropriate levels of challenge and constructive feedback on performance, which are important elements of "flow", and thus also central to positive development and well-being.

However, it may also be that adolescents with higher life satisfaction are more likely to participate in organised physical activity because they have higher self-esteem (Gilman, 2001; Gilman & Huebner, 2006), are more extrovert (Huebner et al., 2004), and generally have more energy to be engaged in such activities. Organised activities are by nature characterised by social interactions with others, and physical activity is for many adolescents mainly a social activity (Wold & Hendry, 1998). It can therefore be assumed that extrovert adolescents, with high self-esteem, will thrive especially well in organised settings. The design of this study does not allow predictions of the causal direction of the relationship between physical activity and life satisfaction. Nevertheless, the SDT-framework holds that social factors in the environment influence adolescents' perception of

autonomy, competence, and relatedness. Satisfaction or thwarting of these needs determine their motivational orientation, which again affect their well-being. Based on the theory and knowledge of adolescents intrinsic motives of participation in physical activity (e.g. Bagøien & Halvari, 2005), it can be inferred that adolescents in organised activities possibly have more experiences of need satisfaction compared to the comparison groups.

It may also be that the unorganised active- and the inactive adolescents are highly involved in some other sort of leisure activity, which accounts for their comparable level of life satisfaction to the organised active. Contrary to the initiative-measure, the measure of life satisfaction in the current study assesses global life satisfaction, that is, it is not domain specific. If a more differentiated assessment of life satisfaction was applied, larger group differences may have been observed.

Regarding gender differences within the physical activity groups, boys reported significantly higher levels of life satisfaction compared to girls in all groups. The power of these differences was nonetheless also very low, indicating that the real distinction between the genders is small. The large sample size in this study allowed detection of statistical significant differences, even when the effect of these differences was small. The diminutive gender differences observed, are in line with most research in the area of adolescents' life satisfaction, where global life satisfaction is similar across genders, albeit some report that boys have a tendency to report higher life satisfaction than girls (Gilman & Huebner, 2003).

To recapitulate, although significant differences were found in levels of life satisfaction between the genders and the three physical activity groups, the distinctions were of low power. This implies that adolescents overall have relatively high life satisfaction across gender and physical activity group, with the organised active boys showing the highest level of life satisfaction.

7.6 Initiative mediates the relationship between physical activity and life satisfaction

The theoretical assumptions stemming from research on physical activity in the domain of SDT, in combination with Larson's pioneering work on initiative development in adolescence, made the basis for proposing that initiative might mediate the relationship between physical activity and life satisfaction. It is well-established that regular physical activity participation has positive impacts on both physical and psychological health. However, it is important to know how and why this relation exists in order to understand which underlying mechanisms are involved. A mediator, in this case initiative, is a suggested mechanism through which a given predictor variable, physical activity, influences an outcome variable, life satisfaction. The following sections will first discuss the mediation results including the whole sample, then the genders are considered separately, before the findings are evaluated as a whole.

Initiative experiences partially mediated the relationship between physical activity and life satisfaction, when the entire sample was included in the analysis. The mediation was partial, because the direct path from physical activity to life satisfaction remained significant when initiative was included in the model. Nevertheless, the results revealed that almost 60 percent of the effect of physical activity on life satisfaction went through initiative, whereas just over 40 percent of the effect was direct. There are of course many factors that affect adolescents' life satisfaction, and the relationship is complex. In the current study only three variables were included, in an attempt to increase our knowledge of which factors in adolescents' everyday life influences their well-being. The model explained about eight percent of the variance in adolescents' global life satisfaction for the entire sample and across genders, disclosing that there is a range of other influences both within the individual and in the environment.

Still, based on this finding and the theoretical assumptions underlying the mediation model, it can be implied that physical activity participation resulted in higher life satisfaction, because it produced more experiences of initiative, which in turn lead to higher life satisfaction. The data from the 15 year-olds in this study was thus to a certain extent consistent with the model in which initiative experiences in physical activity causes life satisfaction. The finding will be discussed in more detail after the gender specific results are examined.

7.6.1 What role does initiative play for girls compared to boys?

Contrary to what was expected, the results revealed that initiative fully mediated the relationship between physical activity and life satisfaction for girls, whereas for boys there was a partial mediation.

For girls, almost 90 percent of the effect of physical activity on life satisfaction went through initiative experiences, indicating that such experiences were salient in girls' physical activity participation. This finding might imply that girls who are regularly physically active at the age of 15, are particularly dedicated, determined, and motivated, and value the positive developmental experiences from such participation dearly. For boys, on the other hand, half of the effect of physical activity on life satisfaction went through initiative. Therefore, experiences related to initiative did not seem to play the same role for adolescent boys, compared to girls.

Several factors may explain the observed gender differences. For example, findings from the field of cognitive psychology suggest that girls tend to perform better than boys on planning and attention tasks (Naglieri & Rojahn, 2001). Planning and attention are important cognitive processes, which affect many areas of people's everyday life, and they

are also highly salient for the development of initiative (Larson et al., 2004). Naglieri and Rojahn argue that the gender differences in these abilities may be due to girls' earlier maturation of the prefrontal cortex, which is responsible for the brain's executive functions, and thus vital for individuals' problem-solving and planning skills. Being able to make plans, and pay attention to the given tasks at hand, are vital for many of the skills that are considered important for positive development, such as self-control, self-monitoring, and decision making (Naglieri & Rojahn, 2001). Girls' moderately advanced abilities in these areas may help explain why initiative experiences in physical activity seemed to play a very important role for girls' life satisfaction, yet not so much for boys'.

It is interesting to notice that boys in general scored higher than girls on physical activity frequency, dosage of initiative experiences, and level of life satisfaction. Concurrently, initiative experiences seemed to play a more significant role for girls in relation to their life satisfaction. These findings indicate that the genders may appreciate the experiences they have in physical activity differently. Further research is needed to increase the scientific understanding of these gender differences, as suggested in section 7.8.1 below.

7.6.2 The impact of initiative in physical activity on life satisfaction

As conferred in the above sections, initiative seemed to play a different role for adolescents' life satisfaction when the entire sample was examined, compared to when the genders were considered separately. On the whole though, it can be inferred that initiative did contribute significantly as an important element in the relationship between physical activity participation and life satisfaction in adolescence.

The majority of the physically active adolescents in this study were regularly active in an organised setting several days a week. The theoretical assumptions of this thesis are based on the notion that organised activities are especially suitable for initiative development, because they entail a certain structure where adolescents have the opportunity to be voluntarily involved, build on their competences, and receive valuable feedback and guidance from adult leaders, over time (Larson, 2000). Previous research has demonstrated that physical activities are particularly beneficial for initiative development (Larson et al., 2006). The current study adds to this finding, by indicating that initiative experiences in physical activity are at least partially important for adolescents' life satisfaction. In addition, SDT suggests that physical activity is a suitable setting for satisfaction of the basic psychological needs, by being an arena where adolescents participate voluntarily, they build on their competences, and they relate to others (Ryan & Deci, 2007).

In line with the results reported in this thesis, qualitative research confirms that adolescents involved in organised activities learn skills and values such as discipline, team work, responsibility, time management, hard work, persistence, and dealing with disappointments - abilities central to initiative development (Fredricks et al., 2002). Moreover, enjoying the activity at hand and feeling competent, as well as socialising with friends, are salient reasons for participation. The combination of enjoyment and competence building seem to be important motivating factors, whereby adolescents spend time and efforts, and remain in the activity (Fredricks et al., 2002). In a similar vein, the physically active adolescents in this study, who experienced the elements necessary for initiative development on a regular basis, might have felt more competent and motivated than their peers.

Furthermore, Fredricks et al. found that adolescents who experienced that their level of ability was not matched with the demands of the activity, would leave (Fredricks et al.,

2002). According to SDT, satisfaction of the need for competence is important, because it is linked to feelings of mastery over one's capacity to act in the environment (Deci & Ryan, 2000). If adolescents feel that they master a given task, their self-efficacy and confidence may improve. However, too little challenge may lead to de-motivation and reduction in effort, whereas too much challenge on the other hand can produce frustration, and adolescents may terminate the activity (Fredricks et al., 2002). Therefore, in line with Csikszentmihaly's "flow" theory, these findings suggest that it is vital to provide optimal challenges to adolescents, in order for them to develop their skills, and remain in the activity. When children reach adolescence and gain more autonomy, they can to a greater extent decide whether they want to stick with the activity or leave, depending on their perceived match between their competence and values, and the demands of the activity (Fredricks et al., 2002).

Recognition and feedback from significant others have been emphasised as important for adolescents perception of own competence (Fredricks et al., 2002; Ryan & Deci, 2000). SDT proposes that the basic needs must co-occur for people to experience intrinsic motivation and well-being. The adolescents in Fredrick et al.'s study who continued and thrived in the organised activities experienced that the needs for autonomy, competence, and relatedness were satisfied. In addition they learned vital skills necessary for cognitive advancement (Fredricks et al., 2002).

Based on the findings in the current study, it can be assumed that adolescents who participated in physical activity on a regular basis, experienced many of the elements observed in Fredricks et al.'s qualitative study. The findings from this study adds to Larson's previous work on initiative, by demonstrating that the experiences adolescents have whilst taking part in physical activities, contributes significantly to their life satisfaction.

However, it could also be the case that adolescents with higher life satisfaction are more likely to participate in physical activity, and thus feel more initiative. It must be acknowledged, that the mediational relations found in the current study might not have been evident, if other variables that cause both initiative and life satisfaction had been included in the model. There may therefore be alternative models, and further research is needed to investigate the relationships in more depth. In addition, longitudinal data using the same variables can provide models of causation with more certainty. More detailed suggestions for further research is discussed in section 7.8.1 below.

7.7 Moderating effects of SES?

Socioeconomic status was included in certain analyses to investigate a possible moderating role of socioeconomic background. No moderating effects of SES were found, indicating that the associations between physical activity and initiative/life satisfaction were of a similar nature for the adolescents in this study, regardless of their socioeconomic background. This finding is in line with previous work on developmental experiences in leisure time activities, where no interaction effects were found for demographic variables including SES (Larson et al., 2006).

7.8 Strengths and limitations

The following sections will first consider the strengths and weaknesses of the current research, before suggestions regarding further research on the topic are proposed.

First of all, this thesis adds to previous work in the field of positive psychology by investigating the nature of underlying elements in the relationship between physical activity

and life satisfaction in adolescence. Furthermore, it extends Larson and colleagues' work on positive youth development and initiative, by revealing that initiative mediates the relationship between physical activity participation and life satisfaction. Considering that research on initiative experiences in adolescence is a relatively new endeavour – and most of it has taken place in North America – it is important to apply the newly developed instruments on large samples, in different places of the world. This thesis therefore strengthens the theoretical foundation of Larson's work, by substantiating the assumption that organised settings are especially conducive for initiative development also among adolescents in Norway.

Secondly, this thesis used a survey instrument that is widely used and acknowledged in a range of countries across the world. Moreover, it included a large, representative sample of Norwegian adolescents. The random selection of participating schools, in combination with the large sample size allows inferences about generalisability to be made. Consequently, it can be assumed that the responses from the adolescents in this sample are a realistic representation of 15 year-olds in Norway. Nevertheless, the high withdrawal rate at school level may indicate selective, underlying characteristics in the schools, which may affect the generalisability of the study. Care must therefore be taken when interpreting the results. However, although cluster sampling was used, the impact of school class on the outcome variables was minimal.

Thirdly, the findings in this study may have implications for the way society organises leisure time activities for adolescents. Scientific knowledge about the basic features which underlie the relationship between important variables in adolescents' lives, may facilitate, and impact, changes in existing policy and practice. This will be discussed in more detail in the “implications”-section below.

However, methodological limitations must also be considered. Firstly, the cross-sectional design used in the study cannot provide predictions about causality. Rather, the study explores possible associations between physical activity, initiative, and life satisfaction, and further longitudinal design is needed to predict causal relationships between these variables.

In addition, there are methodological issues regarding the survey method, and the instruments used to measure physical activity, initiative, and life satisfaction. First of all, the survey method “dictate” the responses participants can give. The provided questions and response categories limit participants’ opportunity to express their true feelings and experiences, and the researchers cannot easily obtain clarifications or elaborations from the participants. On the other hand, an advantage of survey design is that a large number of people are reached in a relatively short period of time.

Secondly, measuring physical activity is a complex matter. The overall question on weekly frequency of moderate to vigorous physical activity, covers by nature a wide range of activities. Although the reliability and validity of this measure have been found to be satisfactory (Booth et al., 2001), self report measures are likely to be biased in terms of social desirability-, over- and under representation-, and recall issues (Sallis & Saelens, 2000), which must be considered when interpreting the results. The methodological challenges just mentioned are exaggerated in research with adolescent participants, because measurement error is likely to increase (Boreham & Riddoch, 2001). Nevertheless, such biases are likely to be systematic throughout the sample, and should not influence the results to a large extent (Booth et al., 2001).

Furthermore, the physical activity variable measuring whether activities were carried out in organised settings or not, was recoded, transformed, and adapted in order to group adolescents into three physical activity profiles. By rearranging variables in such a

way, the error rate is expected to increase. However, because of the large sample size, the nature of the associations between the variables in this study is likely to be reliable, in spite of increased error. Thus, even though there are important issues regarding subjective measures of physical activity, it is assumed that the instruments used in this study captured the intended elements of adolescents' leisure time physical activity habits.

The initiative measure is a relatively new instrument, and the construct validity – the degree to which an instrument measures the intended hypothetical construct (Cresswell, 2003) – should be considered. It can be questioned if the items in the initiative scale measure underlying individual differences in personality that already exist – which are not dependent on external influences – rather than experiences related to initiative in physical activity. However, considering the findings from the current and previous research, initiative experiences do seem to vary depending on situational factors, such as organised against unorganised activities. Further research is however needed on the initiative construct, in order to clarify any ambiguity regarding validity. This will be discussed in more detail in the below section on future research.

Considering the life satisfaction instrument, it can be argued that stronger associations may be found, if a domain specific life satisfaction measure was used. Life satisfaction in adolescence is influenced by a vast array of factors. The current study employed a psychosocial theoretical framework, and assessed only a few of the variables involved in generating people's well-being. Consequently, a limited part of the picture was captured. However, the findings from this study reveal that physical activity and initiative experiences explain about eight percent of variation in adolescents' general life satisfaction. More sophisticated measurements using multiple indicators for the variables in question are needed, in order to be able to explain variations in life satisfaction with more certainty.

A further limitation is that the basic needs from SDT were absent in the statistical analyses, although they were used as indicators of intrinsic motivation and well-being in the theoretical assumptions underlying the current research questions. Future research should aim to include an assessment of need satisfaction in physical activity, in addition to initiative experiences and life satisfaction, to get a more accurate picture of the associations between these variables. Further suggestions for future research are presented next.

7.8.1 Future research

Considering that research on positive youth development is only starting to emerge, there are ample opportunities for further, innovative research in this area.

First of all, regarding the initiative construct, more research is needed to improve the adaptability of the instrument, across countries. The current Norwegian translation lost some of the intended elements from the American original, which may influence comparability, and interpretation of the results. Further research should also be undertaken to examine if the initiative scale measures underlying personality differences, rather than initiative experiences. However, in the mean time, assuming that the instrument measures the intended construct, initiative experiences should be also investigated across different types of activities, in addition to various domains of physical activity such as individual-versus team activities. It would also be interesting to examine gender differences in the abovementioned suggestions, in order to increase our understanding of why and how the genders experience participation in physical activity differently.

Furthermore, more sophisticated and precise measurements of the nature of adolescents' physical activity participation should be developed, and applied in future studies. This way, one can obtain more accurate information regarding the influence of

different kinds of physical activity involvement (e.g. organised vs. unorganised), on adolescents' developmental outcomes.

Regarding socioeconomic differences, future research should perform multilevel modelling to examine the influence of socioeconomic status on the mediated relationships found in the present study.

In addition to the abovementioned suggestions of quantitative research, it is considered necessary to perform complimentary qualitative research, to get a more in-depth understanding of adolescents' experiences in physical activity, and the associations with motivation and well-being. Both interview- and observational studies can bring forward useful and rich information regarding adolescents', as well as adult coaches', perspectives and experiences of organised, compared to unorganised activities. By observing various forms and settings of physical activity, researchers can examine adolescents' and adult leaders' behaviour in terms of basic needs- and initiative facilitation. A mixed approach is encouraged, where both quantitative and qualitative methods are applied to investigate the same phenomena, to get an in-depth and broad understanding of the applicable variables.

7.9 Implications

The present findings may have implication for health promotion practice, and for the organisation of physical activities for adolescents.

First of all, knowing that organised activities play an important role regarding initiative development in adolescence, efforts should be put forward to provide ample opportunities for participation in organised activities in the local communities, across the country. The Norwegian government's action plan on physical activity emphasises the importance of low-threshold neighbourhood facilities to increase the activity level in the

population (Regjeringen, 2005). Findings from the present study indicate that in order to gain the greatest benefits from physical activity, it is insufficient to provide only material amenities for physical activities, such as football fields, sport halls, or so called containers¹. It is the structure and organisation of physical activity that is central to adolescents' development of positive life skills. In addition, knowing that organised activities become a more salient contributor to adolescents' weekly physical activity (van Mechelen et al., 2000), efforts should be made to offer a varied, yet sustainable assortment of organised activities that is attractive to as many adolescents as possible. Therefore, it is important to educate qualified coaches, who are aware of the important influence they have on participants' experiences and development in the activity.

To begin with, it is important that coaches facilitate a climate that supports the basic psychological needs. If coaches provide participants with some sort of choice, and pursue a habit of autonomy-supportive communication, the need for autonomy is likely to be satisfied (Standage, Gillison, & Treasure, 2007). Moreover, if opportunities are provided where adolescents can maximise their perceived competence against personal standards, and where coaches encourage and facilitate the development of friendship and social bonds between participants, the needs for competence and relatedness are supported as well (Wilson & Rodgers, 2007).

Secondly, to facilitate initiative development, a task-oriented climate should be pursued where an emphasis is placed on learning, effort, and improvement as key to success (Amorose, 2007). By providing optimally challenging and meaningful tasks; adequate and encouraging feedback; and promoting collaboration among participants, the coach creates a climate with positive developmental implications for participants, including

¹ The so-called containers, or "binge" in Norwegian, are popular fenced-in grounds with artificial turf, placed in neighbourhoods across the country for children and adolescents to enjoy free play and ballgames.

improved perceived competence, enjoyment, learning, sport behaviour, and reduced anxiety (cf. Amorose, 2007).

Pertaining to health promotion practice, the findings from the current study show that organised physical activity can be a central arena for health promotion efforts among adolescents. Considering that physical activity is a highly valued and very popular activity among adolescents in the Norwegian culture, a large proportion of the population can be reached if efforts are aimed at this age group. The next and final section brings forward some concluding remarks.

7.10 Conclusions

To conclude, learning to take initiative – that is to voluntarily plan and put forth efforts over time, in order to reach an aspiration – appears to be an important feature of organised physical activity participation in adolescence. The ability to be self-determined and to take initiative is of increasing importance for optimal functioning in today's rapidly changing world. If adolescents can learn in organised physical activity that efforts and engagement over time will bring about positive outcomes, they are more likely to be successful and happy in other domains of life as well.

The findings from this thesis demonstrate that adolescents in organised physical activities are more frequently active, experience more initiative, and have higher life satisfaction, than their peers who are unorganised active, or inactive. Moreover, the structure and adult guidance adolescents receive in organised activities seem to aid their psychosocial development. Furthermore, the findings indicate that initiative experiences in physical activity have positive implications for adolescents' general life satisfaction, especially for girls. Therefore, being intrinsically motivated to do an activity, and feeling

competent and able to exert adequate efforts over time in order carry something through, seem to benefit adolescents' health.

By making organised physical activities easily accessible and available for all adolescents, and by promoting a motivational climate that support satisfaction of the basic psychological needs, intrinsic motivation, initiative, and life satisfaction can be promoted. By that, adolescents can develop and attain adaptive psychosocial- and physical health habits in safe environments, which they – and society as a whole – can benefit from in the long run.

8.0 References

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Appendices

Appendix 1: Measures

Appendices 1a to 1e contains scanned photocopies of the original items in the HBSC-questionnaire.

Appendix 1a: Physical activity measure I: Frequency of moderate to vigorous physical activity

50. Utenom skoletid: Hvor mange GANGER i uka driver du idrett, eller mosjonerer du så mye at du blir andpusten og/eller svett?

- hver dag
- 4-6 ganger i uka
- 2-3 ganger i uka
- en gang i uka
- en gang i måneden
- mindre enn en gang i måneden
- aldri



Appendix 1b: Physical activity measure II: activity profile

59. Her er noen spørsmål om dine fritidsaktiviteter. Hvis du ikke holder på med aktiviteten, krysser du bare av i den første boksen og går over til den neste aktiviteten på listen. Hvis du holder på med aktiviteten, skal du sette to kryss på hver linje, ett under A og ett under B.

		A: Hvilke av disse aktivitetene holder du vanligvis på med på fritiden?				B: Gjør du denne aktiviteten vanligvis i en organisasjon/idrettslag?	
		Holder ikke på med denne aktiviteten	2-3 ganger i måneden eller sjeldnere	Omtrent 1 dag i uken	2 ganger i uken eller mer	Ja	Nei
a)	Forball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Håndball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Basketball eller andre ballspill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Fridrett	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	Karate, Taekwondo, Judo, Jiu Jitsu o.l.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Bryting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g)	Boksing/Kickboksing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h)	Vektløfting/Vekttrening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i)	Turn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j)	Dans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k)	Jogge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l)	Aerobic/Trening i sal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m)	Svømmetrening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n)	Sykle vinterhalvår	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o)	Sykle sommerhalvår	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p)	Turgåing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q)	Langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r)	Alpin/Snowboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s)	Ishockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 1c: Initiative measure

58. I løpet av dette skoleåret: Hvor ofte har du hatt følgende opplevelser når du holder på med fysisk aktivitet? Sett kryss:

	Svært ofte	Ganske ofte	Av og til	Ikke i det hele tatt
a) Jeg legger ned all min energi når jeg driver med fysisk aktivitet i fritiden.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Jeg setter meg selv på prøve gjennom fysisk aktivitet i fritiden.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Jeg er konsentrert, når jeg driver med fysisk aktivitet i fritiden.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Jeg bestemmer selv om jeg skal drive med fysisk aktivitet i fritiden.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Jeg finner ut hvordan jeg kan oppnå det jeg ønsker når jeg holder på med fysisk aktivitet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Jeg planlegger hverdagen min for å kunne holde på med fysisk aktivitet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 1d: Life satisfaction measure

16. Sett ett kryss for hver påstand i den boksen som best beskriver hvor ofte du har følt deg slik i løpet av de siste ukene.

	Aldri	Av og til	Ofta	Nesten alltid
a) Jeg er fornøyd med hvordan jeg har det for tiden.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Livet mitt går bra.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Livet mitt er akkurat slik det skal være.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Jeg kunne tenke meg å forandre mange ting i livet mitt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Jeg skulle ønske livet var annerledes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Jeg har et godt liv.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Jeg trives med hva som skjer i livet mitt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Jeg har det jeg ønsker meg i livet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Jeg har det bedre enn de fleste andre på min alder.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 1e: Socioeconomic status measure

7. Har din familie bil?

- nei
- ja, en
- ja, to eller flere



8. Har du eget soverom?

- ja
- nei

9. Hvor mange ganger har du reist et sted på ferie med familien din i løpet av det siste året?

- ingen
- en gang
- to ganger
- mer enn to ganger

10. Hvor mange PC-er har familien din?

- ingen
- en
- to
- mer enn to