An empowerment-based school physical activity intervention with adolescents in a disadvantaged community

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An empowerment-based school physical activity intervention with adolescents in a disadvantaged community

A transformative mixed methods investigation

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Abstract

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It is important for the health of adolescents to engage in regular physical activity. The majority of adolescents do not, however, engage in sufficient physical activity to meet contemporary guidelines, and adolescents of low socioeconomic status appear to be less physically active compared to adolescents of high socioeconomic status. As such, the overall aim of this thesis is twofold. First, the thesis aims to gain insight into adolescents', from a multicultural community of low socioeconomic status, views on physical activity. Second, the thesis aims to describe and problematize the development and implementation of an empowerment-based school intervention, in a Swedish multicultural community of low socioeconomic status, and to evaluate the effects of the intervention focusing on basic needs satisfaction, motivation, and objectively measured physical activity.

This compilation thesis is based on four papers and is written within the 'How-to-Act?'-project which has its starting point in a two-year empowerment-based school intervention. For the purpose of the 'How-to-Act?'-project, one intervention school (n=54 7th graders) and two control schools (n=60 7th graders), situated in a multicultural area of low socioeconomic status in Gothenburg, were recruited. For paper I and II, focus group interviews were conducted with adolescents (n=53) in the intervention school, before implementation of the intervention, to illuminate what they convey concerning factors that facilitate respectively undermine their physical activity. Paper III

describes and problematizes the development and implementation of the empowerment-based school intervention, which was continuously developed and implemented through cooperation and shared decision making, focusing on physical activity. For paper IV physical activity was measured with accelerometers and basic needs satisfaction and motivation through questionnaires at baseline (7th grade), midpoint (8th grade), and endpoint (9th grade), to evaluate the effects of the intervention.

On the one hand, the adolescents' voices illuminated that, within their environment, it is difficult to establish healthy physical activity habits. More specifically, the adolescents expressed a profound awareness of tempting screen-based activities as undermining their physical activity, and several stereotypical gender norms were highlighted as undermining the girls' physical activity. On the other hand, the adolescents mentioned that they enjoyed engaging in physical activity. According to the adolescents, enjoyment related to physical activity was promoted through variation and options, experiencing and developing physical skills, and the presence of peers. The adolescents also suggested that social support facilitated their physical activity, and proposed some ideas on how the school could become more supportive of their physical activity. Through the empowerment-based school intervention, the adolescents were offered opportunities to engage in a variety of physical activities and to assess and critically reflect upon health-related information and recommendations. Further, the intervention involved the adolescents in the decision-making process and thus, arguably, facilitated participation and empowerment. Nonetheless, the development and implementation of the intervention led to a number of ethical dilemmas that required cautious consideration.

During the course of the two-year intervention, there was a credible decrease in controlled motivation, autonomous motivation, and moderate-to-vigorous physical activity. There were no credible effects of the intervention on controlled motivation, autonomous motivation, or moderate-to-vigorous physical activity. Future school-based physical activity interventions, in multicultural areas of low socioeconomic status, are recommended to include multidimensional intervention approaches across contexts to counteract the decline in physical activity during adolescence and to achieve lasting change in adolescents' physical activity.

Sammanfattning (Swedish summary)

Regelbunden fysisk aktivitet är viktigt för ungdomars såväl fysiska som psykiska hälsa. En majoritet av dagens ungdomar är dock inte tillräckligt fysiskt aktiva för att uppfylla de rekommendationer som finns avseende fysisk aktivitet. Det finns även vissa indikationer på att ungdomar med lägre socioekonomisk status är mindre fysiskt aktiva än ungdomar med högre socioekonomisk status. Således var syftet med denna avhandling tvådelat. Det första syftet var att skapa en förståelse för vilka faktorer ungdomar, i ett multikulturellt område med låg socioekonomisk status, uttrycker främjar respektive underminerar deras fysiska aktivitet. Det andra syftet var att beskriva och problematisera utvecklingen och implementeringen av en egenmakts-baserad skolintervention, i ett multikulturellt område i Sverige med låg socioekonomisk status, samt att utvärdera effekten av intervention med fokus på grundläggande psykologiska behov, motivation och objektivt mätt fysisk aktivitet.

Denna sammanläggningsavhandling bygger på fyra delstudier och har sin utgångspunkt i en tvåårig egenmakts-baserad skolintervention med fokus på kost och fysisk aktivitet ('How-to-Act?'-projektet). Till 'How-to-Act?'-projektet rekryterades en interventionsskola (n=54 årskurs 7:or) och två kontrollskolor (n=60 årskurs 7:or) från ett multikulturellt område i Göteborg (Angered) med låg socioekonomisk status. För delarbete I och II genomfördes fokusgruppsintervjuer med ungdomarna (n=53) från interventionsskolan för att belysa vilka faktorer de uttryckte främjade respektive underminerade deras fysiska aktivitet. Delarbete III beskriver och problematiserar utvecklingen och implementeringen av den egenmakts-baserade skolinterventionen, vilken kontinuerligt utvecklades och implementerades genom samarbete och delat beslutsfattande mellan ungdomarna och forskargruppen. För att utvärdera effekten av intervention i delarbete IV mättes grundläggande psykologiska behov och motivation med frågeformulär samt fysisk aktivitet med accelerometrar i början av årskurs 7, 8 respektive 9.

Å ena sidan visar ungdomarnas röster att det är svårt för dem att vara regelbundet fysiskt aktiva i sin miljö. Närmare bestämt uttryckte ungdomarna en djup medvetenhet om hur frestande skärmbaserade aktiviteter (t.ex. smartphones och surfplattor) underminerade deras fysiska aktivitet. Dessutom talade ungdomarna om att brist på socialt stöd från familj och vänner underminerade deras fysiska aktivitet samt att stereotypa könsnormer (t.ex. att fysisk aktivitet framför allt ansågs vara för pojkar) utgjorde ett hinder för

flickornas fysiska aktivitet. Å andra sidan nämnde ungdomarna att de tyckte att det var roligt att vara fysiskt aktiva. Enligt ungdomarna var fysisk aktivitet roligt när det fanns variation och valmöjligheter, när de kände sig kompetenta och utvecklade sig förmågor, samt när de var fysiskt aktiva tillsammans med vänner. Ungdomarna uttryckte även att socialt stöd från familj och vänner främjade deras fysiska aktivitet samt de föreslog flera idéer kring hur skolan kunde underlätta för dem att vara fysiskt aktiva (t.ex. längre raster).

Genom den egenmakts-baserade skolinterventionen erbjöds ungdomarna möjligheter att delta i en mängd olika fysiska aktiviteter (t.ex. kampsport, simning, fotboll och dans) och att värdera samt kritiskt reflektera kring hälsorelaterad information och rekommendationer. Ungdomarna involverades i beslutsfattande processer gällande interventionens innehåll, vilket i sin tur främjade ungdomarnas delaktighet. Under interventionens gång uppstod dock en del svårigheter (t.ex. ungdomarnas tendens att leva i nuet, vilket gjorde det svårt att arbeta med långsiktiga målsättningar) vilket försvårade utvecklingen och implementeringen av interventionen. Utvecklingen och implementeringen av interventionen ledde också till en del etiska dilemman (t.ex. huruvida interventionen upplevdes som frivillig eller ej) som krävde noggrann eftertanke.

Under den tvååriga interventionen minskade ungdomarnas motivation till att vara fysiskt aktiva samt deras objektivt mätta fysiska aktivitet på måttlig till hög intensitet. Interventionen hade ingen effekt på ungdomarnas grundläggande psykologiska behov, motivation till fysisk aktivitet eller objektivt mätta fysiska aktivitet på måttlig till hög intensitet. Det vill säga, motivation till fysisk aktivitet och objektivt mätt fysiska aktivitet på måttlig till hög intensitet minskade lika mycket hos ungdomarna i interventionsgruppen som hos ungdomarna i kontrollgruppen. Framtida skolbaserade fysisk aktivitets interventioner, i multikulturella områden med låg socioekonomisk status, rekommenderas att inkludera åtgärder på flera olika nivåer (dvs. individuella, sociala, miljö och samhälleliga) och över fler kontexter (t.ex. skola och fritid).

Contents

List of tables and figures

List of original papers

This thesis is based on the following four papers, which will be referred to by their Roman numbers throughout the text.

I. **Jonsson, L.**, Berg, C., Larsson, C., Korp, P., & Lindgren, E-C. (2017). Facilitators of physical activity: Voices of adolescents in a disadvantaged community. *International Journal of Environmental Research and Public Health, 14*(8). doi: 10.3390/ijerph14080839

II. **Jonsson, L.**, Larsson, C., Berg, C., Korp, P., & Lindgren, E-C. (2017). What undermines healthy habits with regard to physical activity and food? Voices of adolescents in a disadvantaged community. *International Journal of Qualitative Studies on Health and Well-Being, 12:1*, 1333901. doi: 10.1080/17482631.2017.1333901

III. **Jonsson, L**[*]., Fröberg, A[*]., Korp, P., Larsson, C., Berg, C., & Lindgren, E-C. (2019). Possibilities and challenges in developing and implementing an empowerment-based school-intervention in a Swedish disadvantaged community. *Health Promotion International.* Advance online publication. doi: 10.1093/heapro/daz021

IV. Fröberg, A[*]., **Jonsson, L**[*]., Berg, C., Lindgren, E-C., Korp, P., Lindwall, M, Raustorp, A., & Larsson, C. (2018). Effects of an empowerment-based health-promotion school intervention on physical activity and sedentary time among adolescents in a multicultural area. *International Journal of Environmental Research and Public Health, 15*(11). doi: 10.3390/ijerph15112542

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Abbreviations

LPA	Light physical activity
MPA	Moderate physical activity
MVPA	Moderate-to-vigorous physical activity
PE	Physical education
SDT	Self-determination theory
SES	Socioeconomic status
VPA	Vigorous physical activity
WHO	World Health Organization

Chapter 1: Introduction

The development of society and technological advances has contributed to the fact that physical activity is no longer an obvious and natural part of everyday life (see Ng & Popkin, 2012). The physical and mental health of adolescents, however, requires that adolescents engage in daily regular physical activity (Poitras et al., 2016). Nonetheless, it appears that most adolescents in Western countries do not adhere to contemporary physical activity recommendations (Kalman et al., 2015). As individuals go through adolescence, there also seems to be a consistent decline in physical activity (Dumith, Gigante, Domingues, & Kohl III, 2011). Although there has been numerous attempts to increase the physical activity of adolescents, these efforts have been largely unsuccessful (Borde, Smith, Sutherland, Nathan, & Lubans, 2017). Previous attempts have mainly been based on predetermined or fixed intervention strategies, such as an increased number of physical education (PE) lessons, with little or no attention to the adolescents' own ideas and suggestions. In relation to this, it has been proposed that giving adolescents a stronger voice by involving them in decision-making processes, we might be able to create more adequate health-promotion strategies (Sawyer et al., 2012). While there have been some endeavors to include adolescents in health-related research though participatory approaches, the majority of these studies have been cross-sectional (Jacques, Vaughn, & Wagner, 2013). Nevertheless, previous studies have provided us with important insights concerning the factors that make it easier respectively more difficult for adolescents to engage in physical activity (Martins, Marques, Sarmento, & Carreiro da Costa, 2015). It is important to note however, that earlier findings should be understood within the socio-historical context in which they have occurred (Patton, 2015).

In the last couple of years, Europe, including Sweden, has experienced increased socioeconomic segregation (Musterd, Marcińczak, van Ham, & Tammaru, 2015). Socioeconomic inequalities are also evident in the health of adolescents, and some studies suggest that these inequalities in adolescents' health have increased during the last few years (Elgar et al., 2015). Adolescents of low socioeconomic status (SES) seem to experience greater physical and psychological symptoms, have higher body-mass index, lower life satisfaction,

and engage in less physical activity compared to their more privileged counterparts (Elgar et al., 2015). Similarly, in a Swedish context, adolescents of lower SES appear to have greater risk of mortality and physical and mental health problems (Statens folkhälsoinstitut, 2011). Although it appears that most children and adolescents in Sweden are not physically active enough to meet the physical activity recommendations (Centrum för Idrottsforskning, 2017), it seems that there are no differences in objectively measured physical activity among adolescents with low respectively high SES (defined in terms of their parents educational level; Centrum för Idrottsforskning, 2017). Other indicators of physical activity, however, suggest that Swedish adolescents of low SES engage in less physical exercise (Elofsson, Blomdahl, Lengheden & Åkesson, 2014; Statens folkhälsoinstitut, 2011) and are less active in organized sports clubs (Centrum för Idrottsforskning, 2017; Elofsson et al., 2014) compared to adolescents of high SES. Overall, the scientific challenge is thus neither to highlight the health benefits of physical activity, nor the hazards of sedentary behaviors (sitting behavior), but rather to examine how to support adolescents' in multicultural areas of low SES to achieve and maintain physical activity.

In order to address this scientific challenge one intervention school and two control schools were recruited, from the residential area of Angered in Gothenburg, for an empowerment-based school intervention (i.e., the 'How-to-Act?'-project) with the purpose of exploring how young people can be empowered to obtain and maintain positive perceptions and healthy habits regarding physical activity and food[1]. Angered is one of the most segregated districts of Gothenburg (Göteborgs Stad, 2014). Compared to the national average, Angered is characterized as having a high proportion of people of foreign origin, a low average income, long-term unemployment, long-term financial assistance, low educational level, low voter turnout, poor life expectancy, and poor self-reported health (Göteborgs Stad, 2014). Moreover, several residential areas of Angered have been listed as the most vulnerable areas in Sweden, which is demonstrated by parallel social structures, reluctance among the residents to participate in judicial processes, and religious extremism (Nationella operativa avdelningen, 2015). Hence, for fear of being attacked, robbed or otherwise harassed, residents in the area have reported a relatively high unwillingness to spend time alone outside (Göteborgs Stad: Social

[1] Although the 'How-to-Act?'-project is concerned with both food and physical activity, this thesis focuses on physical activity.

resursförvaltning, 2014). Moreover, school segregation in Sweden has increased in recent years (Böhlmark, Holmlund, Lindahl, 2015) and adolescents in low SES communities generally perform worse in school than adolescents in high SES communities (Göteborgs Stad, 2017). The intervention school of the 'How-to-Act?'-project in Angered is attended by about 450 students in fourth to ninth grades. Compared to Swedish standards: the number of students with a foreign background at the school is high above average; the school has received a great share of newly arrived students, and; the students' educational achievement score and the proportion of students in ninth grade who pass all subjects is below average (The Swedish National Agency for Education, 2016). Furthermore, during the last couple of years, there has been several serious incidents reported at the school, such as vandalism (GP, 2015a), fights between pupils (GP, 2015b), and arson (SVT, 2016).

Consequently, this thesis aims to: (a) gain insight into adolescents', from a multicultural community of low SES, views on physical activity; and (b) describe and problematize the development and implementation of an empowerment-based school intervention, in a Swedish multicultural community of low SES, and to evaluate the effects of the intervention.

Context of the thesis: The 'How-to-Act?'-project and adolescence

The 'How-to-Act?'-project

This thesis is written within the 'How-to-Act?'-project, which has its starting point in the above-mentioned empowerment-based school intervention. The 'How-to-Act?'-project was initiated in 2012 at the Department of Food and Nutrition, and Sport Science, University of Gothenburg by an interdisciplinary group of researchers in sport science and food and nutrition with expertise in health promotion, psychology, physiotherapy, pedagogy, and sociology. In September 2013, three doctoral students (including the author of this thesis) were recruited for the purpose of the 'How-to-Act?'-project. The following year was devoted to planning the project, writing the ethics application, and recruiting three schools (one intervention school and two control schools) situated in a multicultural area of low SES. Subsequently, the intervention was implemented and the participants were prospectively followed for two consecutive school years, from the start of 7th grade to the start of 9th grade (for

a more detailed description of the 'How-to-Act?'-project see the methods section).

Adolescence

In this thesis, the term 'adolescent' (*a person between 10 and 19 years of age*; WHO, 2001, p. 2) will be used to refer to the participants in the 'How-to-Act?'-project and in the different papers. Adolescents is used in favor of, for example, 'children' or 'students'. Although these adolescents are by the United Nations definition 'children' (i.e., under the age of 18 years), and are covered by United Nations Convention on the Rights of the Child (United Nations Human Rights, 1989), herein it is believed that the term 'adolescents' better reflects what is characteristic of this age group (see below). Moreover, 'adolescents' is used instead of 'students' since there is more to these individuals than just someone who is formally engaged in learning.

There are obviously large differences in physical, cognitive, social, and emotional development between a 10 year old and 19 year old adolescent (see Sawyer et al., 2012). Consequently, early adolescence (i.e., ~age 10-14 years) better reflects the participants in the 'How-to-Act?'-project. Early adolescence is a critical period in life with the onset of puberty and significant physical, cognitive, social, and emotional development. During early adolescence, individuals typically struggle with "finding themselves", "fitting in", and "feeling awkward about themselves". It is common for individuals in early adolescence to live and act for the present moment and with little concern about the future (Sawyer. 2012), which is evident in their relative lack of future orientation (i.e., the ability to set future goals and plans) and preference for immediate, small rewards rather than larger rewards, received in a more distant future (Steinberg et al., 2009; Lindstrom Johnson, Blum & Cheng, 2014). Hence, it is not surprising that adolescents' lack of future orientation can make them less prone to engage in healthy behaviors, such as physical activity, as many of the benefits associated with such health behaviors do not pay off until the future (McDade et al., 2011). While adolescents' preference for immediate and small rewards can make them prone to engage in (unhealthy) risk behaviors, such as smoking, as such behaviors results in immediate rewards (McDade et al., 2011).

Adolescents growing up in today's society is one of the first generations to become immersed in technologies, which is evident by the fact that 99 percent

of Swedish adolescents in the ages 13-16 years have access to a smartphone (Swedish Media Council, 2017). Consequently, social networking sites and social media has become a new social milieu for adolescents' interactions and an indispensable part of everyday life (Kuss & Griffiths, 2017; Throuvala, Griffiths, Rennoldson, & Kuss, 2019). For example, 89-95 percent of Swedish adolescents in the ages 13-16 years use social media (Swedish Media Council, 2017) and 85-89 percent of Swedish adolescents in the ages 13-16 years follow an Influencer/YouTuber on YouTube or a corresponding platform (Swedish Media Council, 2017). In relation to this, adolescents have expressed that their attachment to smartphones comes with the expense of not interacting with their peers in-person (Throuvala et al., 2019). With respect to electronic communication (e.g., social media), research has shown that adolescents who spend more time on electronic communication and less time on nonscreen activities (e.g., in-person interactions, physical activity) have lower psychological well-being (Twenge, Martin, & Campbell, 2018).

Nevertheless, adolescence is a stage in life during which the foundation for future health behaviors are established, and health outcomes during adolescence have implications for the individuals' future health (Sawyer et al., 2012). Adolescents of low SES do not generally, however, have the same conditions for establishing good health. Adolescents in low-affluence households typically: perform poorer in school; are less oriented to the future and express poorer life chances and cynicism about future work opportunities; are at greater risk of committing crimes; and have lower chances of securing employment compared to adolescents in affluent household (McLoyd et al., 2009). Moreover, adolescents with lower socioeconomic backgrounds generally have a greater risk of experiencing mental health problems, such as depressive symptoms, low self-esteem, and problems with peer relationships, hostility, and drug use, compared to their more privileged counterparts (McLoyd et al., 2009).

Adolescents in Swedish schools in low SES communities generally speak positively about their schools and they seem to like their schools (Beach & Sernhede, 2011). There seem, however, to be some gender differences regarding how the adolescents value school. While adolescent girls largely convey hope in the value of school in order to create a future, boys generally express that the school cannot do anything for them, it has no value for their future life (Beach & Sernhede, 2011). Further, adolescents in Swedish low SES communities generally seem to believe that they do not have the same opportunities as adolescents from more privileged areas, and they perceive themselves as

subordinate or feel that they are 'outside' the normal society (Beach & Sernhede, 2011).

Outline of the thesis

This thesis is structured in the following way: chapter 2 outlines previous research related to physical activity, including, health benefits, recommendations, measurement, and epidemiology of physical activity. Further, chapter 2 describes adolescents' voices of barriers and facilitators of physical activity as well as physical activity interventions. In chapter 3, the theoretical concepts and frameworks that this thesis is grounded upon are presented, that is, health, health promotion, empowerment, self-determination theory (SDT), and a gender perspective. Chapter 4 includes the rationale for this thesis as well as the overall aims and research questions of the thesis. In chapter 5, the design, and epistemological and methodological considerations are presented, as well as methods that have been used and ethical considerations. Chapter 6 contains the results, structured according to the three research questions of the thesis. In chapter 7, the results are discussed in relation to previous research as well as the theoretical frameworks of the thesis. Chapter 8 includes a discussion of the methods used in thesis. Chapter 9 outlines the conclusions of the thesis, including implications and suggestions for future research.

Chapter 2: Background and previous research

In this chapter, physical activity is defined, followed by research concerning the health benefits of physical activity, contemporary physical activity recommendations, methods for measuring physical activity, and physical activity epidemiology. Then previous research concerning adolescents' voices of facilitators and barriers are presented. The chapter concludes with reviewing physical activity interventions targeting children and adolescents.

Physical activity: health benefits, recommendations, measurement and epidemiology

Physical activity is commonly defined as "*any bodily movement produced by skeletal muscles that results in energy expenditure*" (Caspersen, Powell, & Christenson, 1985, pp. 128). As such, physical activity should be viewed as an umbrella term that includes any bodily movement, such as, getting up from a chair, active transportation, as well as more organized forms of physical exercise. Physical activity if often classified in terms of intensity based on their metabolic equivalents of task (MET): light-intensity physical activity (LPA; 1.6-2.9 METs), moderate-intensity physical activity (MPA; 3-5.9 METs), vigorous-intensity physical activity (VPA; ≥ 6 METs; Ainsworth et al., 2011), and MPA and VPA are often combined and referred to as moderate-to-vigorous physical activity (MVPA). These MET values are derived from experimental studies with adults, and although there is no consensus with regard to what MET values to use with adolescents (see Bull et al., 2010; Strong et al., 2005), 4.0 METs seems to represent the lower limit for MVPA in children and adolescents (Trost, Loprinzi, Moore, & Pfeiffer, 2011). Within this thesis, the abovementioned definition of physical activity proposed by Caspersen et al (1985) is adopted, although the focus will be on MVPA.

Health benefits of physical activity

There is a growing body of evidence suggesting numerous potential physical and mental health benefits of physical activity for children and adolescents. The physical health benefits include improved adiposity, bone health (i.e., bone density and bone mineral content), cardiometabolic biomarkers (e.g., cholesterol, triglycerides, and insulin resistance), and physical fitness (i.e., aerobic fitness, endurance, and muscular strength; Poitras et al., 2016). Moreover, concerning mental health benefits, physical activity has been associated with improved self-esteem, cognitive performance, and academic achievement, and physical activity also has the potential to reduce depression and anxiety in children and adolescents (Biddle & Asare, 2011). It is important to note that total accumulated physical activity has been associated with health indicators, however, there seems to be stronger associations between high intensity physical activity (e.g., MVPA) and health indicators, compared to LPA and various health indicators (Poitras et al., 2016). There is nonetheless some evidence to suggest that children's and adolescents' LPA is associated with cardiovascular health (Poitras et al., 2016). Moreover, there exists a clear dose-response relationship between physical activity and health outcomes in children and adolescents, indicating that the more physical activity, the greater the health benefits (Janssen & LeBlanc, 2010).

Physical activity recommendations

Since there are numerous health benefits associated with physical activity, several agencies and organizations have proposed guidelines for children's and adolescents' physical activity (e.g., Kahlmeier et al., 2015). The U.S. Deparment of Health and Human Services (2018), for example, recommend that children and adolescents (aged 6-17 years) should engage in at least 60 minutes of daily MVPA. They also acknowledge a dose-response relationship which entails that more physical activity can result in even greater health benefits. The recommendations further specify that activities mainly should be aerobic, and that three times a week children and adolescents should engage in VPA, and three times a week activities that strengthen the muscles and bones (U.S. Deparment of Health and Human Services, 2018). In Sweden, similar recommendations have been suggested by the Professional Associations for Physical Activity (Yrkesföreningar för Fysisk Aktivitet) and has been adopted by The Swedish Medical Association (Svenska Läkaresällskapet) and the

Swedish Pediatric Society (Svenska Barnläkarföreningen; Berg & Ekblom, 2016).

Measurement of physical activity

Physical activity is a complex behavior that involves any bodily movement produced by skeletal muscles, hence, there are many different dimensions of physical activity that can be assessed, such as, mode (e.g., walking, running, biking), frequency (e.g., times per week), intensity (e.g., MET), and duration (e.g., minutes per session; Caspersen, Powell, & Christenson, 1985). There are numerous ways to assess physical activity such as self-reports (e.g., physical activity questionnaires), direct observations, and objective measures (e.g., pedometers, accelerometers; see Trost, 2007 and Warren et al., 2010 for an overview). The most widely used method to measure physical activity is through self-report questionnaires (e.g., Helmerhorst, Brage, Warren, Besson, & Ekelund, 2012; Warren et al., 2010). There are, however, several limitations with physical activity questionnaires, especially with children and adolescents, such as issues concerning validity, reliability, and sensibility (see Shephard, 2003 and Warren et al., 2010 for an overview). For example, when using physical activity questionnaires, some studies suggest that children and adolescents overestimate their physical activity by about 200 percent, compared to when assessed with objective measures (e.g., Adamo, Prince, Tricco, Connor-Gorber, & Tremblay, 2009). Considering the limitations with physical activity questionnaires, it has been argued that objective measures, such as, accelerometers have great utility when it comes to assessing children's and adolescents' physical activity (Trost, 2007).

Accelerometers

Accelerometers are considered to be able to provide valid and reliable objective measures of children's and adolescents' physical activity (Corder, Ekelund, Steele, Wareham, & Brage, 2008; Reilly et al., 2008). Accelerometers capture movement in terms of acceleration of the body part it is attached to, and the output of an accelerometer is commonly referred to as 'counts' which can be used to quantify the movement's intensity (i.e., light, moderate, and vigorous; Corder et al., 2008). By summarizing the accelerometer's output in terms of counts per minute and total counts it is also possible to estimate mean physical activity intensity and total physical activity respectively. There exists, however,

numerous different accelerometers (e.g., Trost, 2007), and the output of one accelerometer is often not comparable with the output of an accelerometer of another brand (Reilly et al., 2008). The most commonly used accelerometers in research with children and adolescents is from the manufacturer ActiGraph, presumably since it has a growing body of evidence supporting its use (Cain, Sallis, Conway, Van Dyck, & Calhoon, 2013).

Nevertheless, when using ActiGraph accelerometers, researchers are faced with several methodological considerations, such as, which epochs (sampling intervals) to use, how to define non-wear time and a valid day, deciding on the number of days with valid data that is necessary to capture reliable estimates of physical activity, and which cut-point to use to classify physical activity intensity (i.e., LPA, MPA, VPA; Cain et al., 2013; Reilly et al., 2008). The most widely used epoch in studies with children and adolescents is 60 seconds (Cain et al., 2013). It has been argued, however, that shorter epochs (e.g., 5 or 10 seconds) better capture children's and adolescents' intermittent physical activity patterns (Reilly et al., 2008). Although the definition of non-wear time varies (Cain et al., 2013), a recent study suggests that the optimal criterion for non-wear time is 60 consecutive minutes or more of zero counts (Chinapaw et al., 2014). The definition of a valid day and the least number of wear days varies greatly. In studies with adolescents it appears, however, that eight and ten valid hours and three and four days are most commonly used (Cain et al., 2013). It is well known that the choice of cut-point greatly affects the outcome in terms of, for example, minutes spent at a certain physical activity intensity (Vanhelst et al., 2014). Although Freedson, Pober, and Janz's (2005) cut-point appears to be the most commonly used threshold in research with adolescents, recent advances suggest that the Evenson, Cattellier, Gill, Ondrak, and McMurray's (2008) cut-point provides the strongest classification accuracy (Trost et al., 2011).

Physical activity epidemiology

Since there are different ways of measuring physical activity, the prevalence of children and adolescents meeting the physical activity recommendations differs with measurement method. For example, self-report data from Health Behavior in School-aged Children, a large scale cross-national survey including almost 500,000 children and adolescents aged 11-15 years, suggest that about 23 percent and 14 percent of boys and girls respectively are physically active enough to comply with the physical activity recommendations (Kalman et al.,

2015). In Sweden, data from the same study indicate that 16 percent of boys and 12 percent of girls meets the recommendations (Kalman et al., 2015). Further, data from the International Children's Accelerometry Database, including roughly 28,000 children and adolescents aged 2-18 years, show that only nine percent of boys and two percent of girls are physically active enough to adhere to the current recommendations (Cooper et al., 2015). In a recently published Swedish report, physical activity was assessed using accelerometers in about 550 children and adolescents aged 8-17 years (Centrum för idrottsforskning, 2017). Overall, the results showed that 44 percent of boys and 22 percent of girls were active enough to achieve the physical activity recommendations (Centrum för idrottsforskning, 2017). Other indicators of physical activity suggest that about 80 percent of Swedish 13-years old boys and girls are active in organized sports clubs (Thedin Jakobsson, Brun Sundblad, Lundvall, & Redelius, 2018).

In sum, with the aforementioned studies in consideration, it is difficult to determine precisely the percentage of children and adolescents meeting the physical activity recommendations. However, it seems that most children and adolescents are not physically active enough. In general, research shows that physical activity and organized sports participation declines with age, and that girls are less physically active and less active in organized sports clubs compared to boys (Cooper et al., 2015; Centrum för idrottsforskning, 2017; Kalman et al., 2015; Metcalf, Hosking, Jeffery, Henley, & Wilkin, 2015; Thedin Jakobsson et al., 2018). Some studies even indicate that the decline in children's physical activity starts at the age of five (e.g., Cooper et al., 2015).

There is also some evidence to suggest that physical activity, mainly measured with self-reports, varies with SES, and that adolescents with lower SES are less physically active compared to their more privileged counterparts (Stalsberg & Pedersen, 2010). A recent umbrella review, however, found no associations between physical activity and SES in either children or adolescents (O'Donoghue et al., 2018), and studies with only objectively measured physical activity suggest that there is no associations between SES and physical activity in European children (Iguacel et al, 2018) or Swedish adolescents (Centrum för Idrottsforskning, 2017). There might be several explanations to these mixed results, such as, the way physical activity has been assessed (i.e., self-report versus objectively measured) and how SES has been defined (e.g., educational level, income, and/or occupation of parents) in different studies. Hence, it appears difficult to draw any firm conclusions regarding the association

between physical activity and SES in adolescents. There is however evidence to suggest that children and adolescents in Sweden of lower SES are less physically active in organized sports clubs, compared to children and adolescents of higher SES (Blomdahl, Elofsson, Bergmark, Lengheden, & Åkesson, 2019; Centrum för Idrottsforskning, 2017; Elofsson et al., 2014), and these inequalities appear to be increasing (Blomdahl et al., 2019).

Adolescents' views of perceived motives and facilitators of physical activity

When children, adolescents, and young adults are asked why they engage in physical activity and sport, it is common that they mention fun, social interactions (i.e., being with friends), feeling competent and improving their abilities, and mental and physical health benefits (Lindgren, Annerstedt, & Dohlsten, 2017; Martins et al., 2015; Thedin Jakobsson, 2014; Thedin Jakobsson, Lundvall, & Redelius, 2014). In relation to adolescents' physical activity, several facilitators have also been identified, such as perceived competence, social support from family and friends (Martins et al., 2015; Mendonca, Cheng, Mélo, & de Farias Júnior, 2014), having fun while being physically active (Humbert et al., 2008; Martins et al., 2015; Whitehead & Biddle, 2008), intrinsic motivation (Martins et al., 2015) and autonomous motivation (i.e., intrinsic and identified regulation; Owen, Smith, Lubans, Ng, & Lonsdale, 2014). In relation to fun, previous studies have shown that being physically active with friends makes it fun (Humbert et al., 2006; Humbert et al., 2008; Whitehead & Biddle, 2008), and that physical activity becomes fun when the adolescents are good at it (Humbert et al., 2006; Humbert et al., 2008). Moreover, specific facilitators for girls' physical activity includes challenging the social norms concerning femininity (Martins et al., 2015; Spencer, Rehman, & Kirk, 2015).

Some studies have also identified facilitators of physical activity that seem to be specific for children and adolescents from multicultural and/or low SES areas. These facilitators include, for instance, physical activity as a means for staying out of trouble (McEvoy, MacPhail, & Enright, 2016) and places of worship that provide social support (Rawlins, Baker, Maynard, & Harding, 2013). Further, Caperchione, Kolt, and Mummery (2009) reviewed facilitators related to physical activity among culturally diverse adult migrant groups. They found some facilitators that seem to be explicit for adults of culturally diverse

migrant groups, such as, respect of cultural diversity, adjusting physical activities to work with Ramadan and prayer, and adapting facilities (e.g., covering windows) so that men are unable to see women engaging in physical activity. Although these facilitators have been identified by adults, they may also influence adolescents as family has an impact on adolescents' physical activity (Martins et al., 2015).

In relation to organized sports participation in Sweden, children and adolescents have reported that they mainly value learning new things, improving their fitness, feeling good, having fun, feeling a sense of fellowship, and spending time with friends, more than competing, winning, or becoming the best (Elofsson, Blomdahl, Lengheden, Åkesson, & Bergmark, 2018). In a similar vein, Thedin Jakobsson (2014) showed that adolescents (15-19 years of age) who continue with organized sports participation expressed that they; (a) found sports meaningful and fun because they learned new things and developed; (b) enjoyed competing because of the struggle (and they did not necessarily focus on the outcome of competing); (c) found sports fun and meaningful because they shared the experiences with their peers, and; (d) took part in more than one sport (Thedin Jakobsson, 2014; see also Lindgren, Annerstedt, & Dohlsten, 2017; Thedin Jakobsson, Lundvall, & Redelius, 2014).

Adolescents' views of physical activity barriers

Several barriers to adolescents physical activity have been identified, such as lack of motivation, low perceptions of competence, lack of time, competing leisure activities (e.g., studying, spending time with friends, and screen-based activities), lack of social support from family and friends, long distances to sports clubs (Martins et al., 2015), and short school breaks (Morton, Atkin, Corder, Suhrcke, & van Sluijs, 2016). Previous studies have also highlighted that housework obligations may hinder girls from engaging in after-school activities such as sports (Dodson & Dickert, 2004). Other studies has shown that both girls (Humbert et al., 2006) and boys (Dagkas & Stathi, 2007) from low socioeconomic families mention family obligations as a barrier to physical activity, whilst adolescents from high socioeconomic families do not (Dagkas & Stathi, 2007; Humbert et al., 2006). Moreover, studies have found that homework is a barrier for adolescents' physical activity (Humbert et al., 2006), girls may, however, perceive greater academic expectations from their parents, compared to boys (e.g., Slater & Tiggemann, 2010). Furthermore, specific

barriers for girls that have been identified in the literature are feelings of anxiety related to physical appearance while or after being physically active (Martins et al., 2015; Sabiston, Sedgwick, Crocker, Kowalski, & Mack, 2007; Whitehead & Biddle, 2008), social norms which entail that physical activity is unfeminine and that some sports are only for boys (Martins et al., 2015; Spencer Rehman, & Kirk, 2015), and that adolescent girls do not want to get sweaty and are concerned about their looks after being physically active (Spencer et al., 2015; Whitehead & Biddle, 2008).

There also appear to be some physical activity barriers that are specific for children and adolescents from multicultural and/or low SES areas. These barriers include, for example, concerns about safety in the neighboring area and monetary costs (Rawlins et al., 2013; Taverno Ross & Francis, 2016). Similarly, the review by Caperchione, Kolt, and Mummery (2009) found some barriers that seem to be explicit for adults of culturally diverse migrant groups, such as, physical activity as being prohibited for women, times of prayer (i.e., activities have to stop for prayer), Ramadan (i.e., refraining from eating and drinking), language barriers, religious fatalism (i.e., believing that one's health is in the hands of God, and that physical activity cannot reduce the risk of diseases), and the perception of increased heart rate and sweating as a state of illness rather than a normal byproduct of being physically active (Caperchione, Kolt, & Mummery, 2009). Although these barriers have been identified by adults, they might also affect adolescents as family is an important influence over adolescents' physical activity (Martins et al., 2015).

Physical activity interventions

Broadly, an intervention can be considered "*a combination of program elements or strategies designed to produce behavior changes or improve health status among individuals or an entire population*" (Missouri Department of Health & Senior Services, 2019). There exists a variety of intervention approaches, such as, informational approaches, behavioral approaches, social approaches, and environmental and policy approaches (see Lox, Martin Ginis, & Peruzzello, 2014), which can be implemented in a range of settings, including for instance, homes, schools, and communities. In this section, the focus will be on reviewing school-based physical activity interventions and empowerment-/participatory-based physical activity interventions targeting adolescents.

There have been numerous attempts to increase adolescents' physical activity levels through school-based interventions, and reviews and meta-analyses examining their effectiveness have shown both inconsistent results (e.g., Brown & Summerbell, 2009) and support for their effectiveness (e.g., Camacho-Miñano, LaVoi, & Barr-Anderson, 2011; De Bourdeaudhuij et al., 2011). It is important to note, however, that the majority of interventions in these reviews have used self-report questionnaires to assess physical activity. Considering the aforementioned limitations with self-report questionnaires, these results should be interpreted with caution. A meta-analysis, from 2012, that only included controlled trials with objectively measured physical activity outcomes concluded that PA interventions targeting children and adolescents only have small effects, with an average increase of approximately four minutes of walking or running per day (Metcalf, Henley, & Wilkin, 2012). A more recent systematic review and meta-analysis set out to determine the impact of school-based randomized controlled trials on objectively measured physical activity among adolescents (Borde et al., 2017). There were large differences in the length of the interventions (ranging from four weeks to 28 months), and in the strategies implemented to promote physical activity (e.g., active breaks, health education, extra PE lessons, parental engagement, and sports equipment). Overall, the meta-analyses showed trivial effects on total physical activity and small effects on MVPA, however, both effects were non-significant. Thus, the meta-analysis indicates that previous school-based interventions has been largely unsuccessful at promoting adolescents objectively measured physical activity (Borde et al., 2017). Similarly, Love, Adams, and van Sluijs (2019) meta-analysis found no effects of school-based physical activity interventions on children and adolescents' objectively measured physical activity. Moreover, a recent umbrella review over physical activity interventions among socioeconomically disadvantaged groups found that few interventions have targeted adolescents of low SES (Craike, Wiesner, Hilland, & Bengoechea, 2018). Those interventions who did target adolescents of low SES, however, were generally not effective at promoting physical activity (Craike et al., 2018).

There has also been some interventions conducted in a Swedish context, targeting children's and adolescents' objectively measured physical activity (e.g., Dencker et al., 2006; Hedström, 2016; Marcus et al., 2009; Nyberg, Norman, Sundblom, Seebari, & Elinder, 2016). In accordance with the previously mentioned meta-analyses, however, these interventions did not result in any significant improvements in the children's and adolescents' objectively

measured physical activity (Dencker et al., 2006; Hedström, 2016; Marcus et al., 2009; Nyberg et al., 2016).

Related to this, it has been argued that the use of theory increases the effectiveness of physical activity interventions (SBU, 2007), and one of the most widely used theories in physical activity interventions is SDT (for a review of theories used in physical activity research, see Rhodes, McEwan, & Rebar, 2018). SDT researchers have conducted several school-based interventions aiming to increase adolescents' physical activity, by training PE teachers to become more autonomy supportive (i.e., being respectful of the students' perspectives and supportive of their students' own initiatives) in their teaching (see Curran & Standage, 2017 for a review). Overall, these interventions have shown promising results and students who are taught by autonomy supportive teachers report increased: basic needs satisfaction, self-determined motivation, engagement during class, academic performance, self-reported leisure time physical activity, and stronger intentions to be physically active on their leisure time (e.g., Chang, Chen, Tu, & Chi, 2016; Cheon, Reeve, & Moon, 2012; Cheon & Reeve, 2013; Cheon & Reeve, 2015; Cheon, Reeve, & Song, 2016).

These SDT-based interventions as well as the other trials (see Bordet et al., 2017 and Metcalf, Henley, & Wilkin, 2012 for an overview) all share some major limitations though, at least from a children's right-, empowerment-, and participatory perspective, since these trials are founded in fixed and predetermined intervention strategies (e.g., educating PE teachers to become more autonomy supportive, increased number of PE lessons, before- or after-school activities). More specifically, every child (or adolescent) should have the right to express their opinion and to be heard in matters affecting their health and well-being (United Nations Human Rights, 2016), the adolescents' wishes and needs should be incorporated into the interventions (Laverack, 2004: Spencer, 2014), and they should be included in decision-making (Shier, 2001). Hence, in order to develop and implement appropriate health-promotion strategies, it is important to include the adolescents in the decision-making process (Sawyer et al., 2012), something that is difficult, if not impossible, with fixed and predetermined intervention strategies.

Empowerment-based and participatory physical activity interventions

There have been some attempts to involve children and adolescents in health research through participatory approaches, however, the majority of these studies have been cross-sectional in nature (e.g., focus group interviews or questionnaires; Jacques, Vaughn, & Wagner, 2013). Moreover, most of these studies have focused on obesity prevention rather than on promotion of healthy habits and few have involved children and adolescents in the development and implementation of interventions (Frerichs, Ataga, Corbie-Smith, & Lindau, 2016). A more recent study by Larsson, Staland-Nyman, Svedberg, Nygren and Carlsson (2018) systematically reviewed participatory interventions focusing on health and well-being with children and young people. They identified 41 interventions of which seven focused on physical activity. None of these seven interventions, however, involved the children or adolescents in the development or implementation of the interventions (Larsson et al., 2018). Hence, there seems to be a clear lack of physical activity interventions that involve adolescents in its development and implementation.

A small number of empowerment-based interventions targeting adolescents' physical activity has been conducted in a Swedish context (e.g., Lindgren, Baigi, Apitzsch, & Bergh, 2011; Lindqvist, Mikaelsson, Westerberg, Gard, & Kostenius, 2014; Lindqvist & Rutberg, 2018). Lindqvist and colleagues (2014) developed a one-month empowerment-inspired physical activity intervention in collaboration with adolescents' and teachers in a ninth grade. The results showed that the adolescents in the intervention group had increased their daily self-reported MVPA with approximately five minutes, compared to the control group which had decreased their daily self-reported MVPA with approximately 25 minutes. The intervention includes a fairly small sample and the long-term impact of the intervention was not assessed. Further, MVPA was assessed using self-reported measures. Considering the limitations with self-report measures, the results should be interpreted with caution. Moreover, Lindgren et al. (2011) implemented and evaluated the impact of a six-month empowerment-based exercise intervention with non-physically active adolescent girls in communities of low SES. Overall, the results showed that general self-efficacy increased for adolescent girls in the intervention group, but remained unchanged in the control group. The results showed no differences in physical fitness between the groups. Further, the study did have some limitations, such as, a relatively

high drop-out. Lindqvist and Rutberg (2018) developed and implemented an empowerment-based active school transportation intervention to promote children's physical activity, by involving the children and their parents and teachers in the development of the intervention. Some preliminary analyses suggest that the children on average increased their physical activity with at least 15 minutes a day, it is unclear, however, how the physical activity was measured (Lindqvist & Rutberg, 2018). The study by Lindqvist and Rutberg (2018) had some major limitations though, such as, a lack of control group, small sample size (n=42), and a short follow-up of four weeks. Nonetheless, the abovementioned studies do highlight the importance of including adolescence in the process of developing health promotion interventions.

Chapter 3: Theoretical frameworks

Within this thesis, several theoretical concepts and frameworks will be used to provide a deeper understanding of the phenomenon being studied, as well as to inform the intervention described herein. It is essential to rely on theory, since: (a) theory aids our understanding and prediction of people's behaviors; and (b) theory provides scientifically validated blueprints, which can guide the development and implementation of effective interventions (Lox, Martin Ginis, & Peruzzello, 2014). More specifically, this thesis relies on concepts of health, health promotion, and empowerment, the theoretical framework of SDT, and a gender perspective, which are all described in greater detail below. The concepts of health and health promotion is used to inform the intervention and constitutes the starting point for the concept of empowerment. The concept of empowerment is used to guide the development and implementation of the school-based intervention presented herein (paper III). SDT will be used to aid the interpretation of the study findings in papers I, II, and IV. It is important to note, however, that SDT was not used to guide or frame the intervention presented in this thesis. Lastly, a gender perspective is used to interpret the findings of papers I and II.

Health, health promotion, and empowerment

Health

There exists numerous determinants of health, such as, age and gender, individual lifestyle factors (e.g., physical activity, diet, tobacco and alcohol use), social and community factors (e.g., friends and family), living and working conditions (e.g., education and health care services), and general socioeconomic, cultural and environmental conditions (Dahlgren & Whitehead, 1991). Since the way health is defined, ultimately reflects how health promotion is approached (Laverack, 2004), it is important to problematize and define the meaning of health. Accordingly, several definitions of health have been proposed. One of the most widely used is that of the WHO which defined health as "*a state of complete physical, mental and social well-being and not merely the*

absence of disease or infirmity" (WHO, 1946). The WHO definition of health has, however, been extensively criticized for being too utopian and idealistic, and impossible to attain (Laverack, 2004). Nevertheless, the WHO definition of health can be seen as an important starting point for the emergence of the health-promoting perspective and for the discussion of a holistic view of health in general (see Korp, 2016). An alternative definition of health has been suggested by Tengland (2006; 2007) which defines health in terms of health-related well-being and health-related ability. On the one hand, health-related well-being is defined as to feel physically and mentally well. On the other hand, health-related ability is defined as having acquired the basic abilities (e.g., to walk and to remember), dispositions (e.g., being able to experience emotions), states (e.g., self-confidence), and beliefs (e.g., realistic beliefs about the world) that are characteristic for the group or culture one is a part of, and having the ability to utilize these abilities, dispositions, and beliefs in a variety of circumstances (Tengland, 2006; 2007).

In addition, Antonovsky (1996) has proposed a salutogenic view of health to guide health promotion. The term salutogenesis may refer to comprehensive model as explained in Antonovsky (1979), one part of that model (i.e., sense of coherence; Antonovsky, 1979) or salutogenesis as an orientation (Mittelmark & Bauer, 2017). This thesis embraces the idea of salutogenesis as an orientation, which means that the area of interest in this thesis is the origins of health and assets for health rather than the causes of disease and risk factors (Mittelmark & Bauer, 2017). In essence, the salutogenic orientation entails that: (a) health is understood as a continuum ranging from healthy to diseased, rather than as a dichotomy (i.e., you either have health or a disease); (b) the focus is on salutary factors that actively can promote health (e.g., physical activity as a means to promote health), rather than pathogenic risk factors (e.g., sedentary behavior as risk factor for diseases); and (c) salutogenesis works with communities of people, instead of concentrating on particular pathologies, disabilities or characteristics of a person (Antonovsky, 1996; Mittelmark & Bauer, 2017). Consequently, in this thesis, health in understood in terms of health-related well-being and health-related ability (Tengland, 2006; 2007), from a salutogenic orientation in which health is understood as continuum, the focus is on salutary factors (i.e., physical activity rather than sedentary behaviors), and we will work with a community of people (Antonovsky, 1996; Mittelmark & Bauer, 2017). One way of attempting to facilitate people's health, is through the process of health promotion.

A brief history of health promotion

'Health promotion' as a term is rather new. As a concept however, it can be traced back to ancient Greece and the writings of Hippocrates (i.e., 'On airs, waters and places', which was a guide to help prevent settlers from getting sick when traveling to new environments; Mold & Berridge, 2013; Porter, 1999). Until the 1980s, most intervention attempts to promote health were carried out using the term 'health education' (Naidoo & Wills, 2009). These efforts were, to a large extent, situated within preventive medicine. It was not until the mid-1970s that the term health promotion was used for the first time (Naidoo & Wills, 2009), in the 'LaLonde report', entitled 'A new perspective on the health of Canadians' (Lalonde, 1974). Further, the Alma Ata conference (WHO, 1978) played an important role for setting the agenda for health promotion. It has been argued that health promotion, in part, arose from a changed view concerning the determinants of health; a tendency to move away from outdated ideas where health was mainly considered in terms of health care services; a shift in focus in terms of moving attention from communicable diseases to chronic diseases, that rather are ascribed to individuals' lifestyles than airborne viruses or bacteria; and an insight concerning the possibility of using primary health care for prevention and treatment (Naidoo & Wills, 2009). Another important step towards modern health promotion, was 'the Ottawa charter for health promotion', which defined health promotion as "*the process of enabling people to increase control over, and to improve their health*" (WHO, 1986, pp. 1), and thus being able to influence the factors that govern their health. Accordingly, health promotion should target political, social, cultural, environmental, behavioral, and biological factors through advocacy for health (WHO, 1986). Further, health promotion should aim at realizing equity in health, and health promotion actions should be customized to meet the needs of the targeted population (WHO, 1986). Additionally, WHO (1986) states that health promotion action includes: (1) building healthy public policy (e.g., legislation, fiscal measures, taxation, and organizational change); (2) creating supportive environments (e.g., work and leisure environments); (3) strengthening community actions (e.g., through the process of community empowerment (i.e., increasing community's ownership and control of their own endeavors and destinies)); (4) developing personal skills (e.g., offering information, improving life skills); and (5) reorienting health services (e.g., the health sector should embrace a health promoting approach, rather than only treating the already ill).

Within this thesis, emphasis will mainly be on behavioral and social factors, and to some extent, environmental factors. Additionally, our health promotion actions will primarily focus on developing personal skills, creating supportive environments, and strengthening community actions. Moreover, it has been argued that empowerment is one of the primary goals of contemporary health promotion (Laverack, 2004; Spencer, 2014).

Empowerment

The concept of power is central to the understanding of empowerment, and broadly, power can be conceptualized as:

> …the capacity or agency to act – *power to*; personal mastery and control – *power within*; exert control over others – *power over*; and *power through*, highlighting more ideological forms of power and the micropolitics of power operating though discursive practices (Spencer, 2014, p. 24).

Within this thesis, power is understood in terms of power over, which means that adolescents should have the abilities to exercise power over their own health (see Spencer, 2014). To gain power over their own health, however, herein it is also believed that the adolescents needs the capacity to act (power to) and personal mastery and control (power within).

Tengland (2008; 2012) maintains that it is essential to distinguish between empowerment as a goal and as a process. Empowerment as a goal refers to the individual's/group's ability to control their health and life. To gain control (or mastery) over one's own health includes that the person can either control or change things in the environment (e.g., home, work or school, and the local community) that influence one's health. It can also include increased control over one's desires and actions which in turn may contribute to avoidance of some health hazards (Tengland, 2012). To gain control (or mastery) over one's life means being able to influence the more encompassing aspects of one's life, such as, family, work or school, society and politics (Tengland, 2012). According to Tengland (2012) there are also more specific or narrow goals within empowerment, such as, increased autonomy, knowledge, self-esteem, self-confidence, and self-efficacy, also referred to as psychological empowerment (Zimmerman & Rappaport, 1988). These mental resources are believed to represent either actual increased control, or they causally contribute to increased control (Tengland, 2012). On the other hand, empowerment as a process relates to the practitioners working together with the participants

involved, and ensuring that the participants control the change process they are involved in, and minimizing of the practitioners power (Tengland, 2008; 2012). Hence, the practitioner should mainly serve as a facilitator while the participants formulate the problems, their potential solutions and actions (Tengland, 2012).

In summary, this thesis embraces both empowerment as a goal and as a process. Empowerment as a process is especially important when working with groups or communities, as the process includes personal encounters between participants and practitioners, and this work with groups or communities is usually referred to as community empowerment (Tengland, 2012). Both the process of empowerment and the community empowerment approach is essential when working with groups and communities in disadvantaged areas (Laverack, 2004; Tengland, 2012). In relation to community empowerment, however, both top-down (i.e., the researchers/practitioners identifies the issue of concern and measures to "solve" it) and bottom-up (i.e., allows the participants, rather than the researchers/practitioners, to identify the issue of concern and gain power of the decision-making process) approaches have been criticized and both approaches are accompanied by several ethical dilemmas (see Braunack-Mayer & Louise, 2008 for an overview). Moreover, it has been argued that sustainable change can only be accomplished through combining top-down (particularly those targeting socioeconomic inequalities) and bottom-up approaches (Labonté & Laverack, 2008). As such, this thesis adopts the *reflective equilibrium community empowerment* approach which combines both top-down and bottom-up approaches of empowerment (Braunack-Mayer & Louise, 2008). More specifically, this means that the community is granted participation and empowerment as they are involved throughout the decision-making process, whilst the need for evidence-based health-information and health-related expertise is also acknowledged. Consequently, the reflective equilibrium community empowerment approach calls for a genuine process of exchange, dialogue, and negotiation between the participants and practitioners (Braunack-Mayer & Louise, 2008).

The concept of empowerment can further be assumed to be closely related to the United Nations Convention of the Rights of the Child, as it emphasizes the importance of listening to children concerning all matters that affect them (including their health and well-being; United Nations Human Rights, 2016). By embracing the perspective of children, it is important to consider a children's right perspective (see United Nations Human Rights, 2016), the children's perspective and a child perspective (Sommer, Pramling Samuelsson, &

Hundeide, 2013; Thulin & Jonsson, 2014). A children's right perspective entails that all children have the same value and no one may be discriminated against. Children have the right to life, development, and the best possible health (see United Nations Human Rights, 2016). A children's right perspective does not only entail the importance of listening to children, their voices also needs to be given thoughtful consideration in agreement with their age and maturity. Moreover, by embracing a children's right perspective, children's participation rights are respected, it promotes personal development, it enhances decision-making and outcomes, it protects the children, and it promotes citizenship, tolerance, and respect for others (Lansdown, Jimerson, & Shahroozi, 2014).

The children's perspective is concerned with the *children's own experiences, perceptions and understandings of their life world* (Sommer, Pramling Samuelsson, & Hundeide, 2013, p. 463). As such, through this thesis, the researchers intends to listen to the adolescents and provide them with an opportunity to make their voices heard. On the other hand, a child perspective entails that "*adult's attention is directed towards an understanding of children's perceptions, experiences, utterances, and actions in the world. Thus a child perspective is not the child's experience*" (Sommer, Pramling Samuelsson, & Hundeide, 2013, p. 463). Consequently, the child perspective allows us, as adults (researchers), to interpret the adolescents' voices through different theoretical concepts and frameworks (Sommer, Pramling Samuelsson, & Hundeide, 2013; Thulin & Jonsson, 2014).

Self-determination theory

SDT is an organismic theory of human behavior and personality. One of the basic assumptions of SDT is that all humans have a natural tendency and desire to be active organisms and to control their own lives in a desired and specific direction (Ryan & Deci, 2000a; 2017). As such, it is proposed that all people, including adolescents, want to move towards increased well-being, growth, maturation, and an integrated self. However, for this to happen, it requires that the circumstances of the environment are favorable. Within SDT, adolescents are viewed as in constant interaction with, and influenced by their context, which can support or inhibit their natural tendency toward development by stimulating or thwarting satisfaction of the three basic psychological needs; autonomy, competence, and relatedness (Ryan & Deci, 2000a; 2017). *Autonomy* involves the desire to control one's own actions and participate in self-chosen activities. *Competence* refers to the feeling of effectively mastering challenging

tasks, and exercising one's personal capacity within a given domain. *Relatedness* includes the perception of having meaningful connections with others and feeling comfortable and involved in a context. Satisfaction of these basic psychological needs is essential for mental development, integrity, autonomous motivation and well-being (Ryan & Deci, 2000a; 2017). In contrast, thwarting of the needs diminishes psychological functioning and prevents the development of autonomous motivation (Vansteenkiste, Niemiec, & Soenens, 2010). Although these stipulations may seem to contradict previous statements regarding adolescents' general lack of future orientation, research has shown that adolescents' basic psychological needs satisfaction contributes to well-being (i.e., life satisfaction and positive affects), whereas thwarting of the basic needs contributes to psychological maladjustment (e.g., anxiety and depression, withdrawal, aggressive and rule-breaking behaviors, and social problems; Rodríguez-Meirinhos, Antolín-Suárez, Brenning, Vansteenkiste, & Oliva, 2019). Thus, it seems that basic needs satisfaction may facilitate future orientation. The concept of future orientation appears, however, to be understudied by SDT-scholars[2].

According to SDT, there are three dimensions of the social environment that can either thwart or facilitate satisfaction of the basic psychological needs. An *autonomy supportive* environment (i.e., provides meaningful rationales, acknowledges negative feelings, uses non-controlling language, offers choice, and nurtures inner motivational resources), as opposed to controlling environment (i.e., thoughts, feelings, and behaviors are directed by others), supports the need for autonomy (Su & Reeve, 2011; Vansteenkiste, Niemiec, & Soenens, 2010). A *structured* environment (i.e., characterized as predictable, contingent, and consistent), versus a chaotic environment (i.e., regarded as confusing or contradictory, and fails to communicate clear expectations and directions), facilitates competence satisfaction (Skinner & Edge, 2002; Vansteenkiste, Niemiec, & Soenens, 2010). Lastly, an *interpersonally involving* environment (i.e., provides affection, warmth, care, and nurturance) promotes feelings of relatedness, as opposed to lack thereof (Skinner & Edge, 2002; Vansteenkiste, Niemiec, & Soenens, 2010).

Within SDT, it is stipulated that the development and persistency of a behavior is dependent on the quality of the motivation (i.e., what energizes and

[2] A search on "future orientation" AND "self-determination theory" in PsycINFO on the 2nd of February, 2019 yielded one hit. That study did not include any measures of basic needs satisfaction (Wininger & Desena, 2012).

gives direction to behavior; Deci & Ryan, 2000; Ryan & Deci, 2017). Accordingly, unlike earlier theories of motivation, the focus is on the quality of motivation, rather than considering motivation as one-dimensional emphasizing the quantity. As such, SDT differentiates between *controlled motivation* (or non-self-determined) and *autonomous motivation* (or self-determined), and suggests that there are three main types of motivation: amotivation, extrinsic motivation, and intrinsic motivation (see Figure 1; Deci & Ryan, 2000).

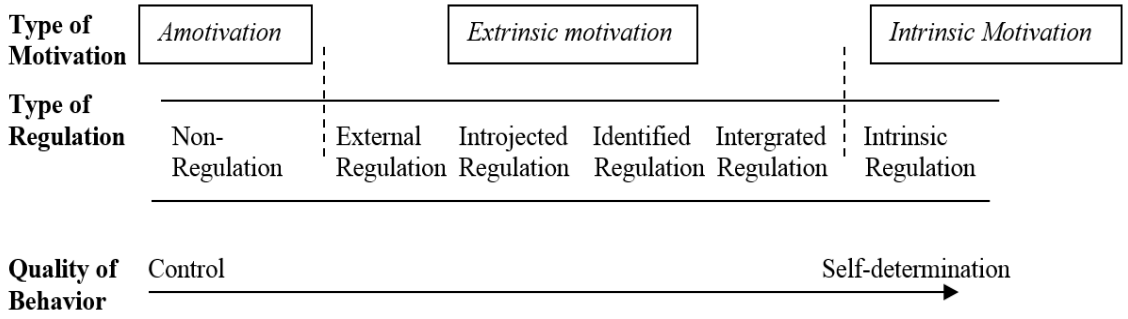

Figure 1. Continuum of Self-determination, adapted from Deci and Ryan (2000).

The experience of *amotivation* manifests itself when adolescents find no meaning with the task at hand, and hence, see no reason to bother getting involved (e.g., an adolescent who skips PE class as he or she sees no reason to engage in PE class). *Extrinsic motivation* is characterized by external influences. Adolescents who are driven by extrinsic motivation usually get involved in order to acquire various types of rewards (e.g., a good grade in school) or to avoid punishments (e.g., yelling from a parent). Adolescents who are *intrinsically motivated* on the other hand, do not set any requirements in terms of external rewards. Instead, intrinsically motivated adolescents find the activity, for instance physical activity, itself satisfactory (i.e., enjoyable, interesting, and/or challenging; Deci & Ryan, 2000).

SDT distinguishes between four different types of extrinsic motivation. The most controlling form of extrinsic motivation is *external regulation*, which means that adolescents are only motivated by the possibility to achieve rewards or to avoid punishments. *Introjected regulation* is also characterized by external factors, for example, to avoid guilt, anxiety and to feel pride. In *identified regulation* the activity feels meaningful, and identified regulation is characterized by personal values such as learning new skills, it is also somewhat more autonomous than the previous regulations. The most autonomous form of external motivation is

integrated regulation, which means that the behavior is fully incorporated into the repertoire of behaviors that meet the person's three psychological needs, and the behavior is in congruence with other personal goals and values (Deci & Ryan, 2000).

Further, as there exists stereotypical gender norms that entail how boys and girls should behave in order to act culturally appropriate, it is also essential to consider a gender perspective.

Gender perspective

Gender is primarily about the social relations within which individuals and groups act (Connell, 2009). Gender is the structure of social relations that focuses on the reproductive arena, and the set of practices that draw in reproductive differences between bodies in social processes. Put differently, gender is about how society relates to the human body and the many consequences those relations bring for people. Durable or vast patterns in social relationships form what social theory calls 'structures'. In that sense, gender must be regarded as a social construction. Gender, as well as other social structures, is multidimensional; it is not just about identity, work, sexuality or power, but about all these factors simultaneously. Gender patterns can differ significantly between one cultural context and another, but they are still gender patterns (Connell, 2009).

It is well known that gender norms (i.e., widely accepted social rules about roles, traits, behaviors status and power associated with masculinity and femininity in a given culture; Kågesten et al., 2016, p. 4) contribute to prevailing symbols and belief systems that influence individual thinking and behavior as well as social structures, institutions, practices, and relationships (Connell, 1987). Moreover, gender norms contribute to gender inequalities, such as, unequal power, discriminatory laws, sociocultural practices, and access and control over resources (Chandra-Mouli et al., 2017). Gender norms create expectations on how boys and girls should behave in order to act in culturally appropriate ways, and research has shown that gender norms develop early in life and intensify during adolescence (Kågesten et al., 2016). Gender norms are usually reflected in adolescents' own gender attitudes (i.e., the individual perceptions, beliefs or endorsement of gender norms*;* Kågesten et al., 2016, p. 4). Adolescents' personal gender attitudes suggest that, on the one hand, boys are expected to be brave, tough, strong, and competitive and should not display

feminine features (such as showing emotions) while they simultaneously should exert heterosexual prowess. Girls are expected to be attractive, beautiful, submissive, nice, and polite and are described as weak and vulnerable (Chandra-Mouli et al., 2017; Kågesten et al., 2016). It has however been argued that gender norms are subject for negotiation and change, which is evident in the growing body of research that demonstrates how individuals or groups/communities of individuals negotiate, challenge and transgress gender norms and practices. For instance, through adolescent boys and girls participating in physical activities considered gender inappropriate (e.g., Chimot & Louveau, 2010; Yu et al., 2017).

Related to gender norms, is the concept of 'boundaries' (Lamont & Molnár, 2002). Boundaries are socially constructed borders or lines that outline patterns of likes and dislikes, which are manifested in how organizations operate and in what individuals think and do (Lamont, 2001). It has been postulated that boundaries are malleable (i.e., subject for negotiation and change; Lamont & Molnár, 2002), as gender norms as highlighted above. Scholars have also made a distinction between symbolic and social boundaries (Lamont & Molnár, 2002). Symbolic boundaries, on the one hand, signify conceptual differences that social actors use to categorize people, objects, practices, and space and time. Social boundaries on the other hand, represent more fixed and "objectified forms of social differences manifested in unequal access to and unequal distribution of resources (material and nonmaterial) and social opportunities" (Lamont & Molnár, 2002, p. 168). Moreover, it has been hypothesized that social boundaries act as tangible inequalities, which surface through symbolic boundaries (Lamont & Molnár, 2002).

Chapter 4: Rationale for the thesis, aims, and research questions

Socioeconomic inequalities in adolescents health has increased during the last few years (Elgar et al., 2015). Some evidence, albeit inconsistent, suggests that adolescents of low socioeconomic families are less physically active compared to their more privileged counterparts (WHO, 2016). Consequently, by illuminating factors that facilitate respectively undermine physical activity of adolescents in a multicultural community of low SES, such insights can provide a deeper understanding of their perspective, something that also aligns with the United Nations Convention of the Rights of the Child (United Nations Human Rights, 2016). Moreover, the identification of such factors may shed light on how to create more effective means to increase and maintain the physical activity of adolescents (Martins et al., 2015). Although previous attempts to increase the physical activity of adolescents have been largely unsuccessful (Borde et al., 2017), these interventions have mainly been based on fixed and predetermined intervention strategies. Hence, by listening to the adolescents and by involving them in the decision-making process and in the development and implementation of an empowerment-based school intervention, it may be possible to create more appropriate health promotion strategies (Sawyer et al., 2012). Consequently, it is essential to evaluate the effects of such an intervention in order to determine its effectiveness.

Overall aim and research questions

The overall aim of this thesis is twofold. First, the thesis aims to gain insight into adolescents', from a multicultural community of low SES, views on physical activity. Second, the thesis aims to describe and problematize the development and implementation of an empowerment-based school intervention, in a Swedish multicultural community of low SES, and to evaluate the effects of the intervention focusing on basic needs satisfaction, motivation, and objectively measured physical activity. More specifically, the purpose of the four papers were as follows:

a) Paper I: to illuminate what adolescents in a multicultural community of low SES in Sweden convey concerning facilitators of physical activity.

b) Paper II: to illuminate factors that undermine the healthy habits of adolescents from a multicultural community with low SES in Sweden with regard to physical activity and food, as stated in their own voices.

c) Paper III: to describe and critically reflect on the possibilities and challenges of developing and implementing an empowerment-based school intervention regarding healthy food and physical activity, involving participants from a Swedish multicultural area characterized by SES.

d) Paper IV: to investigate whether a two-year, empowerment-based, health-promotion school intervention had any effects on changes in (a) accelerometer-measured MVPA, (b) accelerometer-measured sedentary time, (c) self-reported exercise training frequency, and (d) self-reported exercise training duration, among adolescents in a Swedish multicultural area characterized by low SES.

Note that to answer these abovementioned aims, readers are referred to each individual paper. For the purpose of this thesis, however, the following three research questions will be in focus:

a) What factors did the adolescents convey as facilitating and undermining their physical activity and how can these factors be understood?

b) What were the possibilities and challenges in developing and implementing the intervention, focusing on physical activity?

c) What were the effects of the intervention on the adolescents' basic needs satisfaction, motivation, and accelerometer-measured MVPA?

Chapter 5: Method

Overall design, epistemological and methodological considerations

This thesis is written in the discipline of sport science, which at the Department of Food and Nutrition and Sport Science, University of Gothenburg is defined as:

> Sport Science is a third-cycle subject focusing on sport, exercise and physical activity applying a multidisciplinary perspective. Sport Science involves studies of the body and of those participating in sport and physically active individuals, the development of sports culture in society and sport as a collective term for top-level (elite) sport, exercise and experience sports as well as outdoor life and recreation. The starting point adopted is that physical and sports activities can promote health and well-being, performance and aesthetic experience. (University of Gothenburg, 2016, p. 2)

As sport science is concerned with physical activity from a multidisciplinary perspective with the starting point that physical activity can promote health and well-being, it can be argued that the purpose and content of this thesis is in accordance with the abovementioned definition of sport science. Moreover, seeing as sport science is a multidisciplinary discipline, research within sport science is generally conducted with a variety of different epistemological and methodological starting points. Similarly, the 'How-to-Act?'-project, and this thesis, can be assumed to be inspired by a transformative mixed methods design (see Figure 2), which allows for multiple methodological starting points (Creswell & Plano Clark, 2011). The basic premises of a transformative mixed methods design is that a transformative framework is used to underpin a research project for advancing the needs of participants in disadvantaged communities. As is the case with the 'How-to-Act?'-project and this thesis since empowerment (i.e., a transformative framework) constitutes an essential starting point. The purpose of the transformative design is to carry out change oriented research and to empower the participants (Creswell & Plano Clark, 2011).

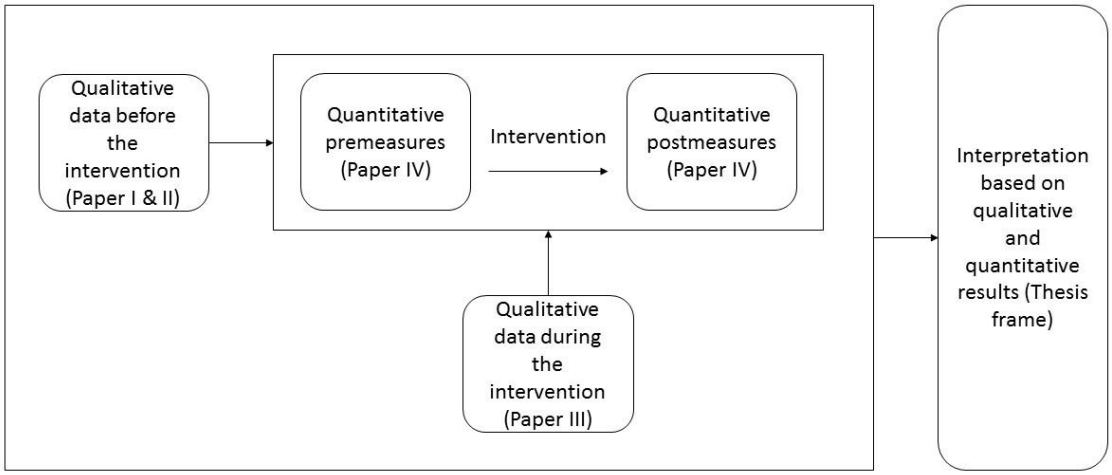

Figure 2. The transformative mixed methods design of the thesis.

In order to aid the empowerment process and to answer the aim of paper I and II, focus groups interviews were conducted with the adolescents in the intervention school before the implementation of the intervention. The preliminary results from the focus group interviews were used to inspire the development and implementation of the intervention[3]. Hence, although, given the purpose of paper I and II, the focus group interviews might as well have been carried out with the adolescents at the control schools, the purpose of the transformative design resulted in only including the adolescents from the intervention school. Second, an empowerment-based school intervention was continuously developed and implemented in collaboration with the adolescents. This process was documented with observational protocols to aid our understanding of, and to answer the aim of paper III, the possibilities and challenges in developing and implementing an empowerment-based school intervention (i.e., paper III). Third, the aim of paper IV is fulfilled through an experimental design with measures at 7th grade (premeasures), 8th grade, and 9th grade (postmeasures), to evaluate the effects of the intervention, in order to determine whether our change oriented endeavors were successful (see Table 1 for a summary of the design, methods and theoretical frameworks of papers I-V.).

[3] Note that paper I was submitted in June 2017 and paper II in January 2017. The final analysis of the data for paper I and II was not completed until the intervention had ended. Thus, mainly notes taken by the assistant moderators during the focus groups interviews was used to inspire the development and implementation of the intervention.

Table 1. The design, methods and theoretical frameworks of papers I-V.

Paper	Design	Participants	Data production	Data analysis	Theoretical frameworks
I & II	Interpretive research design	54 adolescents	Focus group interviews	Qualitative content analysis	The perspective of children, SDT, and a gender perspective[4]
III	Descriptive	54 adolescents	Observation protocols	Reflexive interpretation	Empowerment
IV	Experimental	114 adolescents	Accelerometer and questionnaire	Latent growth curve analyses	SDT

SDT: Self-determination theory

As the 'How-to-Act?'-project and the thesis has a transformative design, the overarching worldview relates to the transformative (or emancipatory) paradigm (Chilisa & Kawulich, 2012; Creswell & Plano Clark 2011). The transformative paradigm is influenced by various philosophies and theories, such as, Marxism, critical theory, and feminist theories, with the purpose of emancipating and transforming communities through group action (Chilisa & Kawulich, 2012; Mertens, 2007). The transformative paradigm entails that there exists multiple realities, which are socially constructed, historically bound and is constantly changing and dependent upon social, political, cultural, and power factors (Chilisa & Kawulich, 2012). The transformative paradigm requires collaboration between the researchers and the participants (Mertens, 2007), and knowledge is only considered to be true when it can be used in practice to empower people (Chilisa & Kawulich, 2012). Although the over-arching worldview of this thesis relates to the transformative paradigm, neither political nor cultural factors will be studied, as these are beyond the scope of this thesis.

Object of study and knowledge object

The object of study in paper I, II, and IV are adolescents in a multicultural area of low SES. The object of study in paper III is the intervention developed and implemented within the 'How-to-Act?'-project. The knowledge object for paper I and II are facilitators and undermining factors of physical activity

[4] In the thesis, both SDT and a gender perspective will be used to aid the interpretation of the findings in paper I and II. In the published papers however, SDT is only used in paper I and a gender perspective is only used in paper II.

among adolescents in a multicultural area of low SES, from a child-, SDT-, and gender perspective. For paper III, the knowledge object is the development and implementation of a school-based physical activity intervention, in a multicultural area of low SES, from an empowerment-perspective. The knowledge object for paper IV is the effects of an empowerment-based school intervention, in a multicultural area of low SES, on objectively measured physical activity from an SDT-perspective.

The 'How-to-Act?'-project: An overview in relation to paper I-IV and my involvement

The 'How-to-Act?'-project is an empowerment-based school intervention with the overall aim of exploring how young people can be empowered to obtain and maintain positive perceptions and healthy habits regarding food and physical activity. During the first semester of the intervention, data for paper I and II were produced through the use of focus group interviews with adolescents in the intervention school. For paper IV quantitative data were collected during semester one (baseline), semester three (midpoint), and semester five (endpoint) at the intervention school and both control schools. As paper III describes and problematizes the development and implementation of the intervention, the data collection period for paper III ranges from the preparation phase to the end of the intervention (see Figure 3). During the course of my doctoral studies, I have been involved in the planning and development of the project, in the development and implementation of the intervention, in collecting baseline, midpoint, and endpoint data, and evaluation of the intervention. As the research process is influenced by the researcher's preconceptions (Solbue, 2011), it might be worth noting that before I became a PhD student in sports science, I earned a bachelor's degree in psychology, a master's degree in psychology, and a master's degree in sport and exercise psychology.

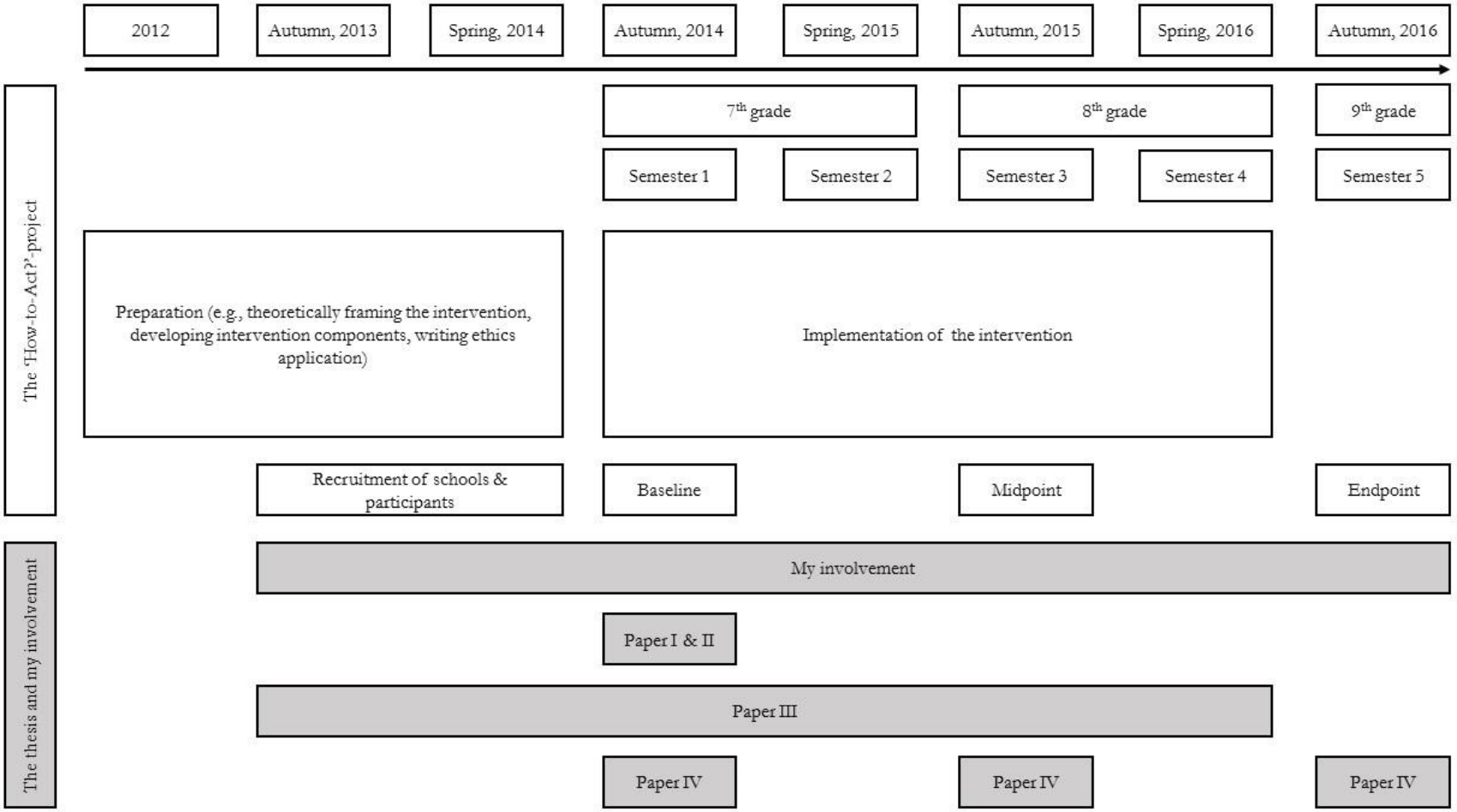

Figure 3. Overview of the 'How-to-Act?'-project and my involvement in the project as well as when data for paper I-IV in this thesis was collected

Recruitment and participants

At a meeting in 2013 with principals and representatives from the student health from all schools in Angered (Gothenburg), the 'How-to-Act?'-project with its proposed empowerment-based school intervention was presented. The principal and representatives from one school were positive towards working in a health promotive manner and wished to participate in the project as the intervention school. This was followed by a recruitment process of two control schools. The intervention school and the two control schools are all found in the same district (Angered), which is characterized as a multicultural area of low SES, with the residential area of the intervention school being even more socioeconomically segregated (see Table 2; Göteborgs Stad, 2014).

Table 2. Descriptive data for the residential area of the intervention school, district of Angered, and the municipality of Gothenburg

Variable	Residential area of the intervention school	Angered	Municipality
Mean economic income (SEK)	143 000	183 000	263 000
Foreign background[1] (%)	84	72	32
Household with economic assistance[2] (%)	28	18	7
Unemployment[3] (%)	17	14	7
Voter turnout[4] (%)	62	63	79
Higher education degree[5] (%)	14	15	33

[1]Foreign-born individuals and individuals with both parents born outside Sweden

[2]Families with economic assistance during the last year

[3]Registred at Arbetsförmedlingen, a national public agency with coordinating responsibility for labor market integration

[4]Municipal election in 2010

[5]Individuals with post-secondary education with a minimum of 180 ECTS

The three schools have relatively comparable characteristics, in terms of school population, student-teacher ratio, and SES (see Table 3; The Swedish National Agency for Education, 2016).

Table 3. Descriptive data from 2014-2015 for the three schools included in the 'How-to-Act?'-project

Variable	Intervention school	Control school I	Control school II	National mean
School population (n)	438	293	327	N/A
7th graders (n)	60	46	46	N/A
Student-teacher ratio[1]	10.3	11.5	8.0	12.1
SES[2]	1.66	1.69	2.15	2.26
EAS[3]	185	162	212	225
Pass in all grades (%)	45.2	24.5	63.6	77.0
New arrivals[4] (%)	19	27	16	5
Foreign background[5] (%)	92	93	75	21

[1]Number of student divided by teachers

[2]Socioeconomic status (SES): The mean of the parents' education level with one point for completed compulsory school; two points for completed upper secondary school; and three points for ≥20 credits from post-secondary education

[3]Educational achievement score (EAS): The score of 16 subjects in the curriculum ranging between 0 and 320 points with 20 points for grade A, 17.5 for B, 15 for C, 12.5 for D, 10 for E, and 0 for F

[4]Foreign-born pupils with foreign-born parents, arrived to Sweden during the last 4 years with no previous experience of the Swedish compulsory school system

[5]Foreign-born pupils and pupils born in Sweden with both parents born outside Sweden

In total, there were 152 7th graders attending the three schools. At the intervention school, however, six adolescents were excluded from the recruitment process since they either changed school during the recruitment process or attended introduction activities for newly arrived immigrants. The remaining study population of 146 7th graders received written (in Swedish, Arabic, and Somali) and oral information about the 'How-to-act?'-project and a consent form for them and their parent(s) or legal guardian(s) to sign if they approved participation. Of the 146 adolescents, 114 adolescents (boys=48; girls=66; 78 % of the study population) approved participation, distributed as follows: intervention school (n=54), control school I (n=26), and control school II (n=34).

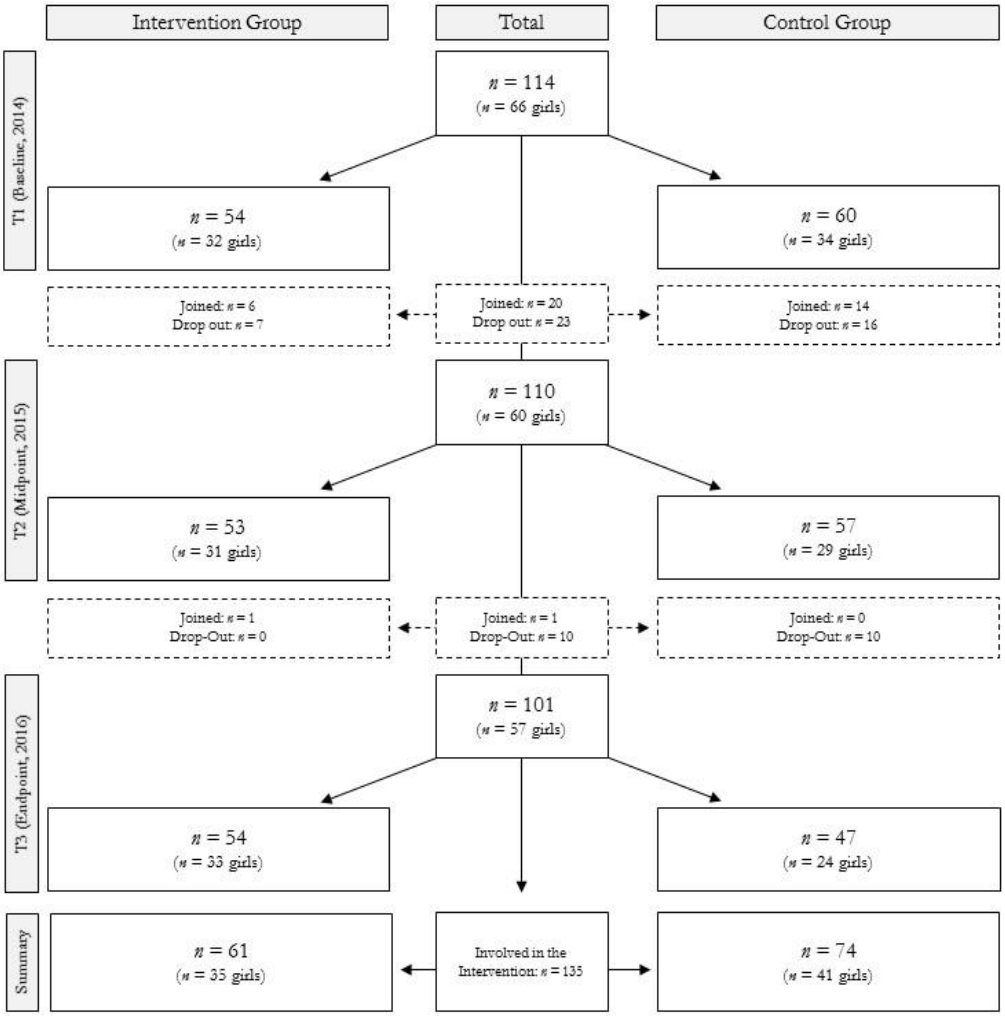

Figure 4. The distribution of adolescents (total sample, the intervention group, and the control group) involved in the project at baseline, midpoint, and endpoint, respectively. The number of adolescents who joined (i.e., transferred to one of the three schools) or those who dropped out (e.g., adolescents who changed school to one outside the project) are illustrated in the dashed boxes. Adapted from Fröberg (2018) with permission.

During the two years of the 'How-to-Act?'-project several adolescents transferred to and from the three schools, and adolescents who were new to the schools were continuously offered the opportunity to participate in the project. Consequently, throughout the two years, a total of 135 adolescents participated in the project (see Figure 4 for the distribution of adolescents involved in the project at T1 (baseline), T2 (midpoint), and T3 (endpoint), respectively), distributed as follows: intervention school (n=61) and the two control schools (n=74). For descriptive data (e.g., body mass index) of the adolescents at baseline and endpoint, see paper IV.

Paper I and II: Procedure, data production, and data analysis

Procedure and data production

Initially, two pilot focus group interviews were performed together with adolescents of the same age, from another school. The pilot study and previous literature (e.g., Dahlin Ivanoff & Hultberg, 2006) together, generated the design of the focus group interviews in this study. The main focus group interviews were conducted, between September and October 2014, with the adolescents (n=53; 32 girls and 21 boys) at the intervention school. By embracing an interpretive approach (Schwartz-Shea & Yanow, 2011; Thorne, 2008) the focus groups aimed to capture the adolescents' complex and shared realities. Focus group interviews were used since they are an effective method to explore how people speak about certain subjects, to recognize the world from the participants' perspective, and they generally allow adolescents to express themselves freely and to make their voices heard (Dahlin Ivanoff & Hultberg, 2006). In total, ten focus group interviews (excluding the two pilot interviews) were conducted with each being attended by four to six adolescents. Four of the focus group interviews were performed with girls only, three with boys only, and three with mixed groups.

Each focus group interview was attended by three interviewers; two PhD students (including myself) and one of three senior researchers. The two PhD students had no previous experience of conducting focus groups interviews, whereas all three senior researchers had prior experiences of performing focus group interviews. The main moderator, with the chief responsibility of keeping the discussion focused and running, was always one of the two PhD students. The other two interviewers functioned as assistant moderators and, as such, took notes and asked follow-up questions when needed. Seeing as there is a naturally occurring power imbalance embedded in doing focus groups interviews with adolescents (Green & Hogan, 2005), the interviews aimed to develop a relationship of trust with, and between, the adolescents. As such, each focus group interview began by explaining that the discussions would remain within the group, that everybody's thoughts and opinions matters, and that there are no right or wrong answers.

In order to guide the focus group interviews, a large sheet of paper with the words "health", "physical activity", "food", "body", and "wishes" printed on it,

was placed on the table. When starting the discussion, the main moderator explained that these were the themes to be discussed, and initiated the interviews by asking broad questions, such as, "what is health?". During the course of the focus group interviews, one of the assistant moderators summarized the adolescents' discussions to confirm accurate interpretation of their statements and in order to induce elaboration of the theme currently discussed. The themes "physical activity", "food", and "body" followed a similar procedure. Every focus group interview was concluded by one of the assistant moderators summarizing the adolescents' conveyed "wishes" (i.e., desire to change, wish for support), in relation to all of the abovementioned themes, on a whiteboard. Further, the adolescents were offered refreshments (i.e., juice and fruits) about halfway into the focus group interviews. On average, the focus group interviews lasted 69 minutes (44 to 97 minutes).

Data analysis

The focus group interviews were analyzed using qualitative content analysis (Graneheim & Lundman, 2004; Krippendorff, 2013), following an abductive approach (Graneheim, Lindgren, & Lundman, 2017). The abductive approach entails a movement between an inductive and deductive analysis (Graneheim, Lindgren, & Lundman, 2017). Qualitative content analysis was deemed appropriate to thematize the data to obtain a description of the facilitators and undermining factors related to physical activity as described by the adolescents. In the analysis, the following five steps were performed:

I. The focus groups interviews were transcribed verbatim and the transcripts were then read in their entirety several times to gain an overall understanding of the adolescents perspective regarding what facilitates respectively undermines their physical activity.

II. With the purpose of identifying similarities and differences in the data, a back-and-forth process with decontextualization and contextualization was carried out. The transcripts were then arranged into meaning units, and some of the meaning units were condensed. The (condensed) meaning units were abstracted and coded (see Table 4). The codes were then arranged into tentative categories by comparing and sorting similarities and differences between the codes. The tentative categories were critically reviewed by all the co-authors several times before they were encoded into final categories. To this stage, the analysis focused on

the manifest content of the transcripts (i.e., the visible and obvious components of the text), thus adhering to children's perspective (see Sommer, Pramling Samuelsson, & Hundeide, 2013; Thulin & Jonsson, 2014).

III. Next, the co-authors moved back-and-forth between the empirical data and the literature to find suitable theories that would help them gain a deeper understanding of and assist their interpretation of the adolescents' perspectives.

IV. The empirical data were then compared and contrasted with SDT and a gender perspective. As such, the co-authors moved from the manifest content to the latent content of the transcripts. In this stage, the categories were also arranged into themes. Consequently, steps III and IV relates to a child perspective (Sommer, Pramling Samuelsson, & Hundeide, 2013; Thulin & Jonsson, 2014)

V. Lastly, for the purpose of this thesis, some of the categories from paper I and II were collapsed and two new themes were arranged, to better answer to the research question of the thesis.

The analysis was performed by the author of this thesis, in close collaboration with the main supervisor. Nevertheless, all steps of the analysis were regularly discussed with all the co-authors until consensus was reached. Although the analysis, as described above, appear to have been done in a linear procedure, the co-authors worked back-and-forth and critically discussed the codes, categories, and themes.

Table 4. Examples of meaning units, condensed meaning units, codes, categories, and themes from the analysis.

Meaning unit	Condensed meaning unit	Code	Category	Theme	
- They [the parents] could try to support me instead of just, do this, do that, lose weight, lose weight. And they can try to do it with me instead, like go out for walk with me instead of just saying that I should go out for walks more.	Parents can support you instead of telling you what to do and go out for walks together	Lack of parental support	Social support, or lack thereof, from family and friends	The influence of family and friends, and the environment	**Paper I & II**
- Is there something else that makes it difficult for you to engage in physical activity? - It can be that you have to do something at home. I always to the dishes at home.	It is difficult to be physically active because you have to help out at home	Household chores	Unequal demands concerning household chores and homework	Gender norms and demands sets the agenda	**Paper II**
- What prevents you from trying different sports? - Mobile phones, IPad's, computers, television. - Everything with technology. - Yes, exactly.	Technology (e.g., mobile phones, IPad, computer) prevents trying sports	Technology prevents	Screen-based activities	Possibilities for enjoyment and interactions	**Paper I & II**

Paper III: Procedure and data production

The intervention was developed and implemented in five phases (with the flow of the intervention being illustrated in Figure 5. In phase one, the intervention was prepared by the research group who theoretically framed and developed the components of the intervention. During phase's two to five, the intervention was further developed, and implemented in the school environment in collaboration with the adolescents and school personnel. The adolescents involved in the intervention were prospectively followed for two consecutive school years, from 7th to 9th grade.

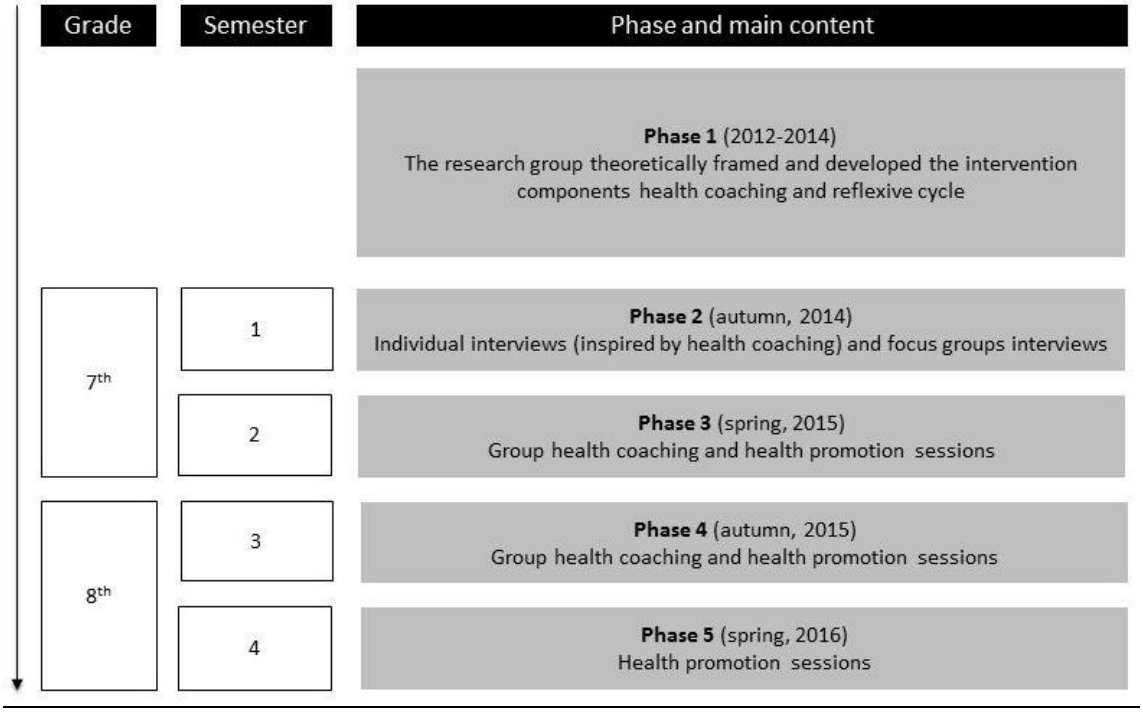

Figure 5. Overview of the phases within the intervention.

The intervention embraced an empowerment-based approach, where empowerment was defined as *possibilities for one to formulate and influence opportunities and barriers for change, and to procure motivation and belief in one's own ability to achieve and maintain healthy food and physical activity habits*. The idea of empowerment as a goal and process was part of the intervention (Tengland, 2007; 2008). More specifically, as proposed by Tengland (2007; 2008), as a goal the intervention aimed to promote autonomy, knowledge, self-confidence, self-control, and self-esteem. As a process, we aimed for the intervention to be continually developed and implemented through cooperation and shared decision making with the adolescents (see Tengland 2007; 2008), as described below. Furthermore, in relation to empowerment, both 'bottom-up' and 'top-down' approaches have been criticized due to ethical tensions and dilemmas (see Braunack-Mayer & Louise, 2008). For example, a pure bottom-up approach can result in practitioners implementing measures that may be harmful to the participants. While purely embracing a top-down approach fails to take into account the participants' concerns and the targeted issues might not be considered important to the participants. In trying to reduce these ethical tensions and dilemmas, the 'How-to-Act?' intervention adopted the principle of the reflective equilibrium community empowerment (i.e., a combination the bottom-up and top-down approach; Braunack-Mayer & Louise, 2008). In order

to achieve sustainable change, it has been argued that it is essential to combine the two approaches, especially when targeting socioeconomically disadvantaged groups (Labonté & Laverack, 2008). In practice this meant that the adolescents were granted participation and empowerment as they were involved throughout the intervention's decision-making process, while the need for evidence-based health-information and health-related expertise was also acknowledged. As such, the intervention involved a process of exchange, dialogue, and negotiation between the adolescents and researchers, as the intervention was continuously developed through collaboration between the adolescents and researchers (see Braunack-Mayer & Louise, 2008). Moreover, in practice, to assist the empowerment process, the intervention utilized the following components: health coaching, health promotion sessions, website and online social network, and a reflexive spiral.

Health coaching

The empowerment process includes involving the participants in formulation of problems, its potential solutions and necessary actions to solve the problems (Tengland, 2012). To achieve this, health coaching was utilized as an approach and permeated the researchers' communication when interacting with the adolescents. Inspired by the work of other scholars (Olsen, 2014), health coaching was defined as *the process of supporting participation through the communication technique of dialogue, with the purpose of facilitating reflection, belief in one's own ability, and strategies for health promoting action*. Accordingly, the researchers relied on techniques such as open-ended questions, exploring options, reframing, expressions of empathy, summaries, and goal setting (Downey, 2003; Heimendinger et al., 2007). Much like the empowerment process (see Tengland, 2007; 2012), the health coaching approach aimed to involve the adolescents in the development and implementation of the intervention by: (a) inviting them to articulate their wishes and needs; (b) listening to the adolescents' suggestions; and (c) putting the adolescents' suggestions into practice. In doing so, the researchers viewed the adolescents as creative, resourceful, and capable of finding unsuspected solutions to their own problem formulations (Heimendinger et al., 2007), which is in line with empowerment approach as people are considered to possess the necessary means to change and develop in a desired direction (Tengland, 2012). Traditionally, health coaching has been performed on a one-to-one basis (Armstrong et al., 2013). Within the

intervention, however, structured group health coaching was employed to identify short and long-term goals and resources to work towards the goals with groups of adolescents.

The structured group health coaching was performed with groups of adolescents who had expressed similar wishes and needs with regard to the intervention. The structured group health coaching sessions were organized according to the goal-oriented T-GROW-model (see Downey, 2003 for an overview). In short, in the first stage of the coaching session, the topic was explored in order to gain an initial understanding of what the adolescents wished to talk about. In the next stage, the goal stage, the coach and the adolescents tried to establish a desired outcome of the session. According to Downey (2003), the goal stage may have the greatest impact on the success of the coaching session. In the reality stage, the coach tried to get a deeper understanding about the topic, as it was at that present moment, and aimed to increase the adolescents' awareness of their situation. In the options stage, the coach and the adolescents explored every possible option regarding the topic, without judging or evaluating them. In the last stage, the coach and adolescents selected the most appropriate option to proceed with, and the adolescents articulated their action plan. Although the stages are described in a rather linear fashion, the coach and the adolescents moved between the different stages in various ways (see Downey, 2003).

During the first phase of the intervention, the research group participated in several educational sessions to establish a mutual foundation of health coaching. These sessions were organized by a qualified coach in practice with extensive theoretical knowledge and practical experience of coaching. Bachelor students, who carried out their supervised practical work within the 'How-to-Act?'-project (see below), had also finished a course in coaching (7.5 ects) and were taught to embrace the coaching approach when interacting with the adolescents.

Health promotion session

Health promotion sessions (intervention activities) were developed and implemented through collaboration and shared decision making between the adolescents and the researchers. The health promotion sessions were integrated to the adolescents' regular curriculum (i.e., their ordinary school schedule) and were usually carried out in the school environment (e.g., classroom, gym, and

schoolyard). The content and aim of the health promotion sessions were guided by shared experiences, the adolescents' wishes and expressed needs, and realistic actions for implementation (i.e., the framework of the intervention and that the content of the health promotion sessions should be possible to execute within given time-frames and the physical environment). The framework of the intervention entailed that the health promotion sessions should revolve around healthy food (i.e., a balanced diet rich in fruit and vegetables, low in high-calorie low-nutrient foods and sugar-sweetened beverages) and physical activity (i.e., a physically active lifestyle with less sedentary behavior) habits. Since the health promotion sessions were implemented during school hours, the homeroom teachers were also involved in the sessions. The homeroom teachers were informed about the theme, aim, and content of the health promotion sessions before each session.

Website and online social network

In August 2014, a website was launched that describes the 'How-to-Act?'-project[5]. The website primarily aimed at providing information to the adolescents and their parents or legal guardians, but was available to the public. Moreover, a Facebook-group was launched in October 2014 that was only accessible for the adolescents at the intervention school. The Facebook-group was managed by the researchers and served as a communication platform between the researchers and the adolescents, and further aimed at facilitating participation.

Reflexive spiral and research group

During fieldwork, two doctoral students (including myself) had the main responsibility to conduct the health coaching and to implement the health promotion sessions (i.e., the majority of health coaching sessions and health promotion sessions were implemented by myself and another doctoral student). The two doctoral students were supported by other members of the research group during health promotion sessions such as whole-day activities. Additionally, the research group was assisted by students at the department, who carried out their supervised practical work within the 'How-to-Act?'-project and who helped with the development and implementation of health promotion sessions.

[5] See: http://iki.gu.se/forskning/forskningsprojekt/pagaende/howtoact

At monthly meetings, members of the research group reflected upon experiences gathered during the course of the intervention and considered further realistic actions for implementation. Inspired by Kemmis, McTaggart, and Nixon (2014), and to aid the reflection procedure, we relied on a 'reflexive spiral' (see Figure 6 and protocols from the health promotion sessions, health coaching sessions, and general observations and reflections (in total: n=145 protocols; 307 pages). More specifically, these protocols consisted of information related to the health promotion sessions (n=52 protocols; 183 pages), such as, the purpose of the health promotion sessions, its content and instructions for implementation, location, and attendance-rate. Self-evaluation forms were used in relation to the health coaching sessions (n=36 protocols; 56 pages; see Appendix 1), in which the researchers documented expectations, experiences and general observations. Moreover, during the health promotion sessions, the researchers documented perceived participation and general observations and reflections (n=57 protocols; 68 pages; see Appendix 2). As the two doctoral students observed and took field notes while simultaneously being involved in the intervention activities, they acted as participants and observers (Mulhall, 2003).

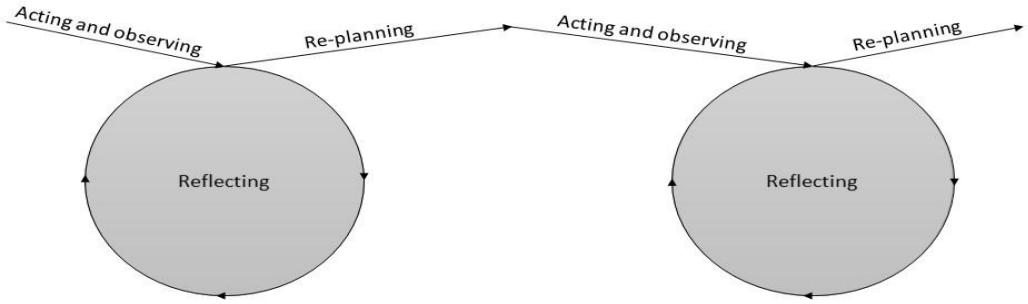

Figure 6. The reflexive spiral, adapted from Kemmis, McTaggart, and Nixon (2014), which served as a basis when reflecting upon experiences gathered during the intervention and further considering reasonable actions for implementation.

Accordingly, these protocols were continuously reviewed and summarized in order to create a basis for critically reviewing and reflecting upon experiences and lessons learned during the course of the intervention[6]. In essence, the

[6] Note that these protocols were not analyzed in a strict manner through, for example, qualitative content analysis. The protocols were only *reviewed* and *summarized* and constituted a basis for discussion at our monthly research group meetings.

reflection procedure was an iterative process and similar to what Alvesson and Sköldberg (2008) describe as reflexive interpretation, meaning that the research group aimed at interpreting the underlying meanings of our experiences and lessons learned, and the adolescents expressed wishes and needs. This iterative process was carried out in five stages as specified below (see Kemmis, McTaggart, & Nixon, 2014):

I. *Acting and observing*: the research group implemented (structured group) health coaching sessions and health promotions sessions, and observed and documented (as specified above) the process;
II. *Reflecting*: the research group reviewed and summarized protocols in order to provide a framework for critically reflecting upon the process associated with the (structured group) health coaching sessions and health promotions sessions;
III. *Re-planning*: the research group re-structured the intervention based on the experiences and lessons learned from stage I and II;
IV. *Acting and observing*: the research group implemented modified (structured group) health coaching sessions and health promotions sessions, and observed and documented the process;
V. *Reflecting*: see stage (II).

The researchers involved in the reflection procedure constituted an interdisciplinary group of researchers in sport science and food and nutrition with expertise in health promotion, psychology, physiotherapy, pedagogy, and sociology.

Paper IV: Procedure, data production, and analysis

Data for paper IV were collected at baseline (September, 2014), midpoint (September, 2015), and endpoint (September, 2016) at the intervention school and both control schools.

Measures

The adolescents completed a questionnaire at baseline and endpoint, which consisted of 28 pages, and took about 30 to 45 minutes for the adolescents to complete. Besides the instruments described below, the questionnaire included questions regarding, for instance, body ideals and food. At midpoint, a shorter version of the questionnaire was used, which consisted of 14 pages, and took

about 20 minutes for the adolescents to complete. The adolescents completed the questionnaire in their home-classroom, with the researchers being present. As such, the adolescents had the opportunity to ask questions regarding the questionnaire.

Basic needs satisfaction and motivation

The Basic Psychological Needs in Exercise Scale (BPNES) was used to assess basic needs satisfaction in relation to exercise/training (Vlachopoulos & Michailidou, 2006). BPNES measures satisfaction of three basic needs, autonomy, competence and relatedness through twelve questions answered on a five-point Likert-Scale, ranging from 1 ("don't agree at all") to 5 ("I completely agree"). Example item: "I feel that the way I exercise is the way I want to". Following the example of Weman-Josefsson, Lindwall, and Ivarsson (2015), one factor for global basic needs satisfaction was created by calculating the mean value for all the three basic needs (i.e., autonomy, competence, and relatedness). The Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2) was used to measure the participants' motivation (i.e., amotivation, external, introjected-, identified-, and intrinsic regulation) in relation to exercise/training (Markland & Tobin, 2004), through 19 questions which are answered on a five-point Likert-Scale, ranging from 1 ("I don't agree at all") to 5 ("I completely agree"). Example item: "I value the benefits of exercise". One factor for controlled motivation (i.e., extrinsic regulation and introjected regulation) and one for autonomous motivation (i.e., identified regulation and intrinsic regulation) was created (see Weman-Josefsson, Lindwall, and Ivarsson, 2015). The BPNES and BREQ-2 have been translated to Swedish using the back-translation method and the Swedish versions have been validated by Weman-Josefsson and colleagues (2015).

Physical activity

Physical activity was measured with ActiGraph accelerometers (model GT3X and GT3X+), since accelerometer from ActiGraph are the most commonly used accelerometers in research with children and adolescents and because there is a growing body of evidence supporting its use (Cain et al., 2013). The accelerometers were initialized as specified by ActiGraph and were worn on the hip by the adolescents by means of an elastic band. The adolescents received both written and oral instructions as well as practical demonstrations regarding how to wear the accelerometer before each data collection period. The

adolescents were instructed to wear the accelerometer for seven consecutive days, during waking hours except when performing water-based activities. It has been argued that relatively short epochs should be used to better capture adolescents intermittent physical activity pattern (Sanders, Cliff, & Lonsdale, 2014), as such, the collected accelerometer data were integrated into five second epochs. As argued by Chinapaw et al. (2014), non-wear time was defined as 60 consecutive minutes or more of zero counts. There is no consensus regarding how to define a valid day and how many valid days are necessary to provide reliable data on adolescents' physical activity (Cain et al., 2013). Nonetheless, the lower limit as proposed by Cain et al (2013) was employed, i.e., at least 8 valid hours with a minimum of three valid days to be included in the analysis, in order to maximize the sample size.

It is well known that the choice of cut-point greatly affects the output of the accelerometer (Vanhelst et al., 2013), and although the Freedson et al. (2005) threshold appears to be commonly used as a cut-point in research with children and adolescents, we employed the cut-point of Evenson et al. (2008) since it provides the strongest classification accuracy (Trost et al., 2011). Accordingly, the following cut-points were used: sedentary time: ≤100 counts per minute; LPA: 101-2295 counts per minute; and MVPA: ≥2296 counts per minute.

Those adolescents who were absent during the start of the data collection at baseline, midpoint, and endpoint, respectively, were invited to complete the questionnaire and wear the accelerometer when they returned to school.

Data analysis

Traditional statistics in general, such as, null hypothesis significance testing (NHST), and the P-value in particular, has been widely criticized and even banned in some scholarly journals (Trafimow & Marks, 2015; Wasserstein & Lazar, 2016). One reason for this criticism seems to be the misinterpretation of the P-value as both a measure of evidence and as a repetitive error rate (Wagenmakers, Lee, Lodewyckx, & Iverson, 2008). For example, many researchers interpret a P-value of 0.05 as just a 5% chance of one's result being false. This is not the case, however, since it only summarizes data assuming a specific null hypothesis (Nuzzo, 2014). In light of this critique, researchers have proposed alternative methods to traditional statistics, such as Bayesian (Nuzzo, 2014; Wasserstein & Lazar, 2016). The fundamental differences between traditional statistics (i.e., frequentist inference) and Bayesian inference is

described elsewhere (Stenling, Ivarsson, Johnson, & Lindwall., 2015; Wagenmakers et al., 2008). As such, in order to analyze the effects of the intervention (i.e., change) at both an inter- and intra-individual level, we used latent growth curve analyses (LGCA) with the Bayesian estimator in Mplus 8.0 (Muthén & Muthén, 2010). Whereas SPSS 24.0 was used to calculate descriptive statistics.

With regard to global basic needs satisfaction, controlled motivation, and autonomous motivation, LGCA were used to analyze change. For each of these factors, in the first model (Model 1) a starting point (i.e., intercept) and change (i.e., slope) from baseline (T1) to endpoint (T3) were specified. In the second model (Model 2), intervention condition (i.e., intervention group vs. control group) was included as a predictor for both the intercept and the slope. In the third model (Model 3), sex was added as a predictor for the intercept and the slope. A similar approach was employed for accelerometer-measured MVPA. The only difference was that average accelerometer wear-time was added in the second model (Model 2), intervention condition in the third model (Model 3), and sex in the fourth model (Model 4) as predictors of the slopes and intercepts.

In order to handle missing data, full information maximum likelihood (FIML) estimation was used. FIML estimation was used since it has been proposed to be superior to more traditional missing data procedures, such as, list wise deletion or imputation (Baraldi & Enders, 2010). By using FIML estimation, the parameter values that had the highest probability of producing the sample data were identified by using all available data. Sensitivity analyses were also performed do determine whether the results remained stable if we: (a) included all participants who provided data for at least one measurement (intention to treat-analysis); (b) only included participants who provided data from at least two measurements, and; (c) only included participants who provided data from all three measurements. All three sensitivity analyses showed similar results, as such, the results from the intention to treat-analysis is presented to maximize the use of available data. Posterior predictive p (PPp) and a 95% confidence interval was used to evaluate model fit. A model with a PPp value of around 0.5 and a symmetric 95% confidence interval, centering on zero was deemed to have an excellent fit. Credibility interval (CI) was calculated for each parameter in the models. The CI shows the probability that the parameters lie between two values, given the known data, and when the 95% does not cross zero, the parameter estimates were regarded as credible. In order words, when the 95% CI did not involve a zero, the null hypothesis was

rejected as improbable. The deviance information criterion (DIC) was used to determine which model showed the best fit to the data. The lower the DIC value, the better the model fit (Gelman, 2014).

Ethical considerations

Health promoting measures, such as the intervention described within this thesis, are at risk of becoming normative enterprises, since such undertakings convey desirable health behaviors and (un)acceptable risk behaviors (see Massé & Williams-Jones, 2012). By assuming an empowerment-based approach, however, some might argue that the intervention was respectful of the adolescents' autonomy and they were not "forced" to adopt normative health behaviors or withstand risk behaviors (see Massé & Williams-Jones, 2012). Since the intervention embraced the reflective equilibrium community empowerment approach, a combination of top-down and bottom-up approaches, the adolescents were involved in the decision-making processes while the need for evidence-based health-information and health-related expertise was concurrently acknowledged (Braunack-Mayer & Louise, 2008). Hence, it is possible to argue that a paradox follows, namely that although the intervention aimed at supporting the adolescents to express their wishes and needs, listening to their needs and putting them into practice, the frames of the intervention entailed that the focus should be on healthy physical activity and food habits and other possible concerns of interest were not considered. In this regard, it might be ethically questionable to focus on physical activity and food in a socioeconomically disadvantaged community since, with respect to the community's characteristics, the adolescents may have had other issues of concern. Put differently, we assumed that the adolescents wanted or needed to focus on physical activity and food habits, without asking them. If we had adopted a pure bottom-up approach, the adolescents might have identified other concerns. Nevertheless, the researchers observed that it could be beneficial for the adolescents to improve their physical activity and food habits, since there were large differences in the adolescents' baseline physical activity (Fröberg, Larsson, Berg, Boldemann, & Raustorp, 2016) and since they, in the focus group interviews, expressed several difficulties with engaging in healthy physical activity and food habits.

Moreover, the research presented within this thesis has adhered to Vetenskapsrådets (2017) recommendations regarding good research practice.

More specifically, through informational meetings and letters (provided in Swedish, Arabic, and Somali), the adolescents as well as their parents or legal guardians were informed about the purpose of the project and that the adolescents' participation was voluntary and that they could withdraw their participation at any time, without having to justify why. However, because all adolescents at the intervention school agreed to participate and since the intervention was implemented during school hours, some of the adolescents may have felt forced to participate as attendance is mandatory in Swedish elementary school. The adolescents were, nonetheless, continuously informed about the voluntary nature of participation in the intervention activities and they were not required to engage actively in the intervention activities. At times, some adolescents were attending and observing the intervention activities, but they did not engage actively in the activities (i.e., passive participation). Also, in agreement with the adolescents' requests, during phase four of the intervention, the adolescents had the possibility to engage in school-based assignments instead of intervention activities related to physical activity and food. Further, written informed consent has been obtained from both the adolescents and their parents or legal guardians. Finally, the 'How-to-Act?'-project and the papers described herein have been approved by the regional ethical committee (#469-14).

Processing of personal data

Processing of personal data followed the General Data Protection Regulation (GDPR; European Parliament, 2016). More specifically, the collected data (e.g., questionnaires, transcribed interviews) have been pseudonymised and labelled with unique identification numbers for each participant. The collected data have been stored in one locked metal cabinet, with the unique identification numbers stored in another locked metal cabinet. The collected data will not be used for commercial use. We did not collect any unnecessary personal data, only the participants' names, age and gender, and personal data relating to their health and health behaviors to be able to answer our research questions. Moreover, personal data will not be stored longer than necessary (see European Parliament, 2016).

Chapter 6: Results

What were the facilitators and undermining factors of the adolescents' physical activity?

Firstly, in order to be able to comprehend what facilitates and undermines the adolescents' physical activity, it is essential to gain an understanding of how they speak about physical activity in general. As seen in paper I, the adolescents mentioned physical activities such as active commuting to and from school, taking a walk with friends, organized physical activities in terms of sports (e.g., football, martial arts) and PE. In general, however, the adolescents talked more about spontaneous physical activities, such as, playing unorganized football or basketball with friends and playing games outdoors (e.g., tag, hide-and-seek).

In response to research question of this thesis, three major themes were identified: (1) The influence of family, friends, and the environment; (2) Possibilities for enjoyment and interactions; and (3) Gender norms and demands sets the agenda, which illuminate factors that facilitate and undermine the adolescents' physical activity (Table 5).

Table 5. Categories and themes regarding what facilitates and undermines the adolescents' physical activity (PA).

Category	Theme
Social support, or lack thereof, from family and friends The (un)supportive environment	The influence of family, friends, and the environment
Physical activity is mainly for boys Unequal demands concerning household chores and homework Lack of time Focus on appearance	Gender norms and demands set the agenda
Personal preference and fun Variation Physical skills Friends Screen-based activities	Possibilities for enjoyment and interactions

The influence of family and friends, and the environment

On the one hand, some of the adolescents mentioned both their parents and friends as important support of their physical activity. For example, in one of the girls' only focus groups, the girls discussed how parental support was essential for them to be able to engage in organized physical activity. This was, nevertheless, not discussed in any of the other focus groups. The adolescents in several focus groups expressed that their friends facilitated their physical activity. If the adolescents, for example, were to join a sports club, they mentioned that they would feel safer if they did so together with a friend. Moreover, if a friend had tried a sport, the adolescents revealed that they could talk with their friend about the sport, which could make them interested in trying it themselves. Hence, it is possible that adolescents who have friends that are members of sports clubs are more likely to join a sports club themselves. Additionally, the adolescents stated that it is easier to engage in physical activity with friends outside the home.

On the other hand, the girls in the aforementioned focus group, expressed that lack of social support from their friends and family served as an undermining factor for their physical activity. For example, the girls mentioned that when their friends had other things do to or simply had no desire to be physically active, this undermined their own physical activity. The girls wished that their family supported their physical activity and, to a greater extent, were physically active together with them, instead of nagging and telling them what

to do and what not to do in relation to their physical activity. Furthermore, the girls stated that their parents' lack of financial support undermined their opportunities to participate in organized physical activities, such as, joining a sports club. Lack of social support as undermining physical activity was not expressed in any of the other focus group interviews.

With regard to the school environment, the adolescents had several ideas of how it could better support their physical activity. For example, some adolescents in one focus group wished for longer breaks between lessons so that they would have time for physical activity. Not all adolescents in that focus group agreed, however, and one adolescent stated that longer breaks would not make any difference with regard to physical activity, as he would still not engage in physical activity. In a similar vein, however, the adolescents in several focus groups indicated that short breaks undermined their physical activity. Adolescents in several other focus groups mentioned that they would like additional PE lessons and/or that the PE lessons could be longer. Furthermore, adolescents in one focus group stated that they would prefer more influence over the content of the PE lessons (i.e., choosing activities). Lastly, one adolescent boy cited long distances to sport clubs as undermining his physical activity and a girl in another focus group stated that inclement weather undermined her physical activity as she did not want to spend time outside when it was raining or when it was cold.

Gender norms and demands set the agenda

A common theme in several focus groups was the notion that physical activity is mainly for boys and that boys in general engage in more physical activity compared to girls. This idea was not shared by all the adolescents, however, and some adolescents expressed that it was rather related to personal preferences and personality. Related to this, some girls stated that they are not physically active since physical activity it not for girls. Similarly, these girls mentioned that girls should not participate in sports because they lack competencies and skills. The girls in several focus groups also proposed that boys in general are more skilled and have more competencies related to physical activity. Additionally, the girls in one focus group highlighted that there are more options for boys in relation to physical activity.

The girls in one focus group also declared that when the boys played football during school breaks, the girls were only permitted to participate sometimes,

which the boys decided upon. Furthermore, when asked what sports clubs the adolescents attend, one boy stated that he likes to dance Albanian dance. When they boy mentioned that he dances, the other adolescents burst into laughter, and he defended his choice of activity by stating that he likes it.

In several focus groups the adolescents stated that girls are expected to do household chores, which occupies their time and prevents them from participating in physical activities. The girls in one focus group also mentioned that boys are not, to the same extent, expected to do household chores and consequently have more leisure time to be physically active. In addition, several girls discussed how school homework occupied their time and made it challenging for them to engage in physical activity during weekdays. Homework was, however, not mentioned by the boys. Moreover, one adolescent mentioned that lack of time in general undermined her physical activity.

When asked how the girls could help other girls to become more physically active, girls in two focus groups suggested that girls in general are concerned about their looks and they do not want to ruin their makeup or hair and they do not want to get sweaty while being physically active. Hence, it appears that some girls are too conscious about their looks while being physically active that they rather withdrawal from physical activities.

Possibilities for enjoyment and interactions

A common theme in the majority of focus groups was that physical activity should be fun for adolescents to participate. The adolescents had different ideas of what constituted fun physical activities, however, and they cited activities, such as, football, martial arts, playing games, and basketball.

The adolescents in several focus groups proposed that it is important to try different physical activities and sports until one discovers an activity that he or she enjoys. They also stated that variation makes physical activity fun. The adolescents in one focus group emphasized PE, for example, since it provided them the opportunity of engaging in several different activities.

The adolescents in the majority of focus groups talked about how feeling competent and skilled made it fun to engage in physical activity. The adolescents in several focus groups mentioned that they felt competent when they developed their physical abilities as well as learned new skills. Some of the girls also stated that they enjoy playing basketball in PE, even though engaging in physical activity was considered to be a masculine pursuit, mostly because

they were good at it. When the adolescents discussed feelings of competence, none of them focused on performance outcomes, such as, winning. Rather, they stressed the importance of having fun and doing their best.

The adolescents in the majority of focus groups stated that they engaged in physical activity as a way of spending time with their friends, and that being physically active with friends made it fun. Thus, social interaction appeared to be an important motivational factor for the adolescents to engage in physical activity.

When the adolescents were asked what makes it difficult for them to engage in physical activity, they talked a lot about different screen-based activities. In every focus group except one, they mentioned playing games or interacting with friends on their mobile phones, tablets, or computers, or watching television. In several focus groups, the adolescents stated that they probably would be more physically active if they did not have access to tablets and smartphones. Some of the adolescents mentioned that they rather play games and interact with their friends online, than engage in physical activity, because it is fun. While other adolescents stated that it is quite boring to spend time in front of their screens. They said that they do so, however, since they have nothing else to do and it is a way for them to interact with their friends. Further, the adolescents stated that it is difficult to stop playing computer and video games and to stop using their smartphones, since they do it every day, and it is always available to them, in contrast to physical activity, which they only engage in occasionally. According to the adolescents' stories, their screens become addictive to them, and the screens appear to be a major barrier for their physical activity. Needless to say, the adolescents showed great awareness of how screen-based activities prevented them from engaging in physical activity.

What were the possibilities and challenges in developing and implementing the intervention?

In the first phase of the intervention, the research group theoretically framed the intervention (i.e., empowerment) and decided upon which intervention components to use (i.e., health coaching, health promotion sessions, a website, and Facebook), which is described in greater detail in chapter 5. In the second phase of the intervention, individual interviews were conducted with all adolescents involved in the intervention to explore what expectations they had of the intervention and what they wanted to achieve through participating in

the intervention. The individual interviews, the focus group interviews described previously, and written statements[7] of the adolescents' goals for the intervention guided the division of the adolescents into six groups as well as the preliminary content for some of the health promotion sessions in phase three (see Figure 4).

Phase three

The six groups consisted of six to eight adolescents each. Although all six groups were interested in both food and physical activity, three of the groups had food as their main focus (groups 1-3) and three had physical activity as their main interest (groups 4-6). One of the groups, who mainly wanted to play football, consisted only of boys, and another group, who primarily wanted to dance, consisted of girls only. The remaining four groups were mixed genders. The first health promotion session of phase 3 was a half-day at the Department of Food and Nutrition, and Sport Science, where the adolescents were provided with the opportunity to engage in both food related activities (e.g., taste tests) and physical activities (e.g., dancing). Inspired by the focus groups interviews, during the half-day we provided all the adolescents opportunities to engage in activities that they considered masculine (i.e., ball games) and feminine (i.e., dancing) in trying to challenge these stereotypical gender norms. The next few health promotion sessions were devoted to activities that the research group believed would be beneficial to all six groups (e.g., resistance training using the body-weight; see paper III and Fröberg (2018) for an overview of the implemented health promotion sessions during phase three). Inspired by the results of the focus group interviews, in which the adolescents mentioned that monetary cost and long distances to sports clubs undermined their physical activity, the researchers believed that resistance training using the body-weight would illustrate a physical activity that did not require any equipment nor costs. Subsequently, structured group health coaching was used to identify common goals for each group and activities they desired to engage in during the health promotion sessions. Within each group, the adolescents and the coach created and agreed upon rules of conduct on how to behave during the structured group health coaching (e.g., 'Respect each other's opinions', 'Do not interrupt

[7] The individual interviews or the written statements were not analyzed in s strict manner. The individual interviews and the written were only summarized to get a sense of what expectations the adolescents had of the intervention and what they wanted to achieve (i.e., goals) by participating in the intervention, and to help guide the division of the adolescents into smaller groups.

each other'). Despite these rules of conduct, several adolescents had a tendency to interrupt the health coaching sessions (protocol from health coaching session, 18 February 2015), by, for example, insulting each other, screaming at each other or talking about other topics. As such, in some of the health coaching sessions, considerable time was spent on structuring and organizing the sessions, rather than talking about the actual content of the sessions. Furthermore, some adolescents stated their disappointment with talking about food and physical activity, rather than engaging in it, as it reminded them of ordinary schoolwork.

The researchers experienced that the adolescents especially enjoyed practical health promotion sessions (i.e., engaging in food-related and physical activities; protocol from health coaching sessions, 25 February 2015; 20 May 2015). The adolescents were generally curious about the health promotion sessions and they had numerous ideas for food-related and physical activities, of which some were more realistic than others. The researchers also experienced that the adolescents appreciated collaborating with their peers, and they appeared to value the responsibility of developing and implementing the intervention together with the researchers (meeting notes, 17 June 2015). Moreover, the researchers experienced that the adolescents were strongly influenced by each other, in the sense that they wanted to engage in the same activities (protocol from health coaching session, 20 May 2015; meeting notes, 17 June 2015). Consequently, most of the groups had similar suggestions for the content of the health promotion sessions. The adolescents also expressed that they especially enjoyed activities that were carried out outside the school environment (protocol from health coaching session, 20 May 2015).

In general, and in relation to the structured group health coaching especially, the researchers experienced that the adolescents had limited interest in talking about their food habits and physical activity from a long-term perspective (e.g., setting long-term goals; protocol from health promotion session, 18 February 2015; protocol from health coaching session, 20 May 2015). The adolescents rather remained focused on the present and they sometimes had difficulties recalling their wishes and/or goals from one occasion to the other. For example, the adolescents in one of the groups expressed that they wished to play basketball. During the next session, when they got the opportunity to play basketball, however, they stated that they had never wished to play basketball (protocol from health promotion session, 18 March 2015). As the structured group health coaching did not function as intended, and due to the adolescents'

suggestion on replacing the sessions with practical activities (e.g., playing sports), the researchers and the adolescents decided that each health promotion session should end with a brief health coaching session (i.e., five to ten minutes). The purpose of these brief health coaching sessions were to help the adolescents reflect upon their experiences of the health promotion session, discuss possible health benefits of certain activities, and develop strategies on how to implemented the activities performed during the health promotion sessions outside the school environment. Overall, the researchers experienced that the modified health coaching and health promotion sessions improved as the adolescents became more involved in the activities when they were more practically oriented (meeting notes, 17 June 2015). Nevertheless, on a few occasions some of the adolescents left the health promotion sessions when it was time for the brief health coaching (protocol from health coaching session, 18 March 2015). Further, the adolescents' had PE lessons the same day as we implemented health promotion sessions during phase three. As such, on some occasions the adolescents expressed that they were too tired to engage in more physical activities (protocol from health promotion sessions, 18 March 2015).

On three occasions, the adolescents got into fights with each other (protocol from health promotion sessions, 25 March 2015; 22 April 2015; 27 May 2015), which caused an uneasy atmosphere and difficulties for the adolescents to focus on the task at hand.

Phase four

As the intervention was not received as expected during phase three and since several difficulties were encountered, especially in relation to the health coaching, the researchers decided to try another approach for phase four. Based on the researchers' experiences, the adolescents' expressed wishes and needs during phase two and three, as well as the results of the focus groups, the researchers' overall assessment suggested that the adolescents wanted to focus on: (I) decreasing screen-based activities and increasing physical activity; (II) engaging in more physical activity during school-hours; (III) playing ball-games; or (IV) engaging in school-based assignments (meeting notes, 17 June 2015). Accordingly, four theme groups were created with the abovementioned themes that the adolescents could choose from. All but two boys chose the theme group involving playing ball-games and the theme group focusing on school-based assignments consisted of girls only. The researchers relied on structured

group health coaching in order to support the adolescents in theme group 1 and 2 to realize their goals of decreasing screen-based activities and increasing physical activity and engaging in more physical activity during school-hours respectively. For practical reasons, the homeroom teachers had the chief responsibility for theme groups 3 and 4 (see paper III and Fröberg (2018) for an overview of the implemented health promotion sessions during phase four).

While not entirely in line with the initial suggestion, the adolescents (n=17) in theme group 1 agreed upon preparing and implementing a whole-day session focusing on healthy food and physical activity that the adolescents in all four theme groups would be exposed to. The adolescents in theme group 1 decided that they wanted to implement practical activities such as cooking vegetarian food and a variety of physical activities. The adolescents searched online for recipes and decided upon what to cook (e.g., soup, lasagna) and wrote shopping lists of what needed to be bought. They also wrote detailed instructions and rules for all the physical activities (e.g., dodgeball, cooperation games). During the preparations, the adolescents were encouraged to provide well-founded arguments for their choice of activities, for example, in relation to the health benefits of physical activity and fruit and vegetable consumption. The adolescents (n=3) in theme group 2 decided that they wanted to create individualized physical activity and food programs, as they wanted to increase their school-day physical activity and fruit and vegetable consumption. The adolescents were encouraged to justify their physical activity and food programs based on contemporary physical activity recommendations and dietary guidelines. The adolescents also borrowed pedometers as they wished to be able to track their physical activity. The adolescents (n=24) in theme group 3 focused on playing ball games, predominantly football. The adolescents were rather autonomous in organizing the ball games, but they were overseen by their homeroom teachers. The adolescents (n=10) in theme group 4 engaged in school-based assignments and were supervised by their homeroom teachers. The adolescents in theme group 3 and 4 agreed to participate in the joint activities, such as, the whole-day prepared by the adolescents in theme group 1. Additionally, during phase 4, all the adolescents were exposed to a workshop addressing opportunities for physical activity in local associations (e.g., sports clubs) together with the researchers and a representative from a community program. The results of the workshop were summarized by the adolescents in theme groups 1 and 2 and created into posters that was displayed in school

environment. The posters included, for example, the name of the association, location, opening hours, and the activities that were offered.

Overall, the researchers experienced that the quality of the structured group health coaching improved during phase four (protocol from health promotion sessions, 7 October 2015; meeting notes, 13 October 2015). The improved quality of the structured health coaching might be explained by that more homogenous groups had been created, possibly since the adolescents could choose which group they wanted to belong to. Also, considerably more time and attention was devoted to identifying the adolescents shared interests within theme groups 1 and 2. Needless to say, the researchers also experienced difficulties with regard to the structured group health coaching during phase four (protocol from health promotion sessions, 23 September 2015, 30 September 2015). For example, it was challenging in the beginning to structure the coaching sessions with theme group 1 as there were 17 adolescents attending. After the adolescents had decided upon implementing a whole-day session, however, they were divided into smaller groups with different tasks (e.g., planning for the food related activities vs the physical activities) which made the structured group health coaching easier to manage. The researcher also experienced that the adolescents in theme group 1 and 2 took responsibility and cooperated well in planning and organizing the health promotion sessions (protocol from health promotion sessions, 7 October 2015). On one occasion, some of the adolescents had thrown a large bench down a staircase in the corridor which caused tumult at the school and the adolescents had difficulties focusing on the task at hand during the health coaching session (protocol from health coaching session, 21 October 2015).

At the end of phase four, the researchers and the adolescents co-created a letter stating the adolescents' wishes in relation to the school environment, which included a drinking fountain in the school corridor, a reinstatement of the food council and the school café [8]. This letter was signed by the adolescents and handed to the school principal. Furthermore, the researchers reviewed and summarized the overall experiences of the phase. Based on this review process as well as the adolescents' statements, the researchers believed that the adolescents would benefit from the following three health promotion sessions: (I) a workshop regarding the body and body ideals in relation to food and

[8] Earlier, the school had an active food council where the adolescents could present their wishes in relation to the school meals. The school also had a school café in which the adolescents could buy snacks, such as, sandwiches. Both the food council and the school café had, however, been shut down.

physical activity: (II) a workshop with Sapere; and (III) visiting an exhibition regarding health and health promotion. The researchers also discussed different approaches on how to support the school in continuing to work with health promotion once the intervention had ended. As such, the researchers agreed upon inviting the school's principal, teachers and other school personnel for a whole-day workshop at the university.

Phase five

During phase five, the three abovementioned health promotion sessions were implemented (see paper III and Fröberg (2018) for an overview of the implemented health promotion sessions during phase five). The workshop regarding the body and body ideals was carried out to provide the adolescents with an opportunity to discuss and critically reflect upon body ideals in today's society. The Sapere workshop aimed at providing the adolescents an opportunity to reflect upon food preferences (e.g., with regard to acidity and sweetness) and to try different foods (e.g., raw, grated, and boiled carrots). The visit to the exhibition addressing health and health promotion was implemented to offer an opportunity for the adolescents to learn and reflect upon different aspects of health. Additionally, the whole-day workshop for the school's principal, teachers and other school personnel was implemented. The workshop focused on presenting preliminary results of the intervention (e.g., from the focus group interviews), basic concepts of the intervention (e.g., health promotion, empowerment), and a discussion regarding possibilities and challenges for the school to continue working in health promoting ways.

What were the effects of the intervention?

In total, data for basic needs satisfaction and motivation were provided by 114 adolescents at baseline, 90 adolescents at midpoint, and 95 adolescents at endpoint. 81 adolescents provided data for basic needs satisfaction and motivation at baseline and endpoint (i.e., loss to follow up 29%) and 69 adolescents provided data for all three measurement points[9]. For the corresponding figures for accelerometer data as well as mean daily accelerometer wearing times, see paper IV.

[9] Note that basic needs satisfaction and motivation was not originally included in paper IV, this constitutes new data for the purpose of this thesis.

There was no credible change in global basic needs satisfaction between baseline and endpoint[10]. Mean values of global basic needs satisfaction at baseline (T1), midpoint (T2) and endpoint (T3) are illustrated in Figure 7. Model 3 showed best fit to the data (see Table 1 in Appendix 3). Model 3 showed that intervention and control group had similar values on global basic needs satisfaction at baseline and that it remained unchanged for both groups over time[11]. The model demonstrated that boys had higher global basic needs satisfaction at baseline compared to girls, it remained unchanged over time, however, for both boys and girls[12]. There were, however, a tendency for girls' global basic needs satisfaction to decrease more than boys'[13].

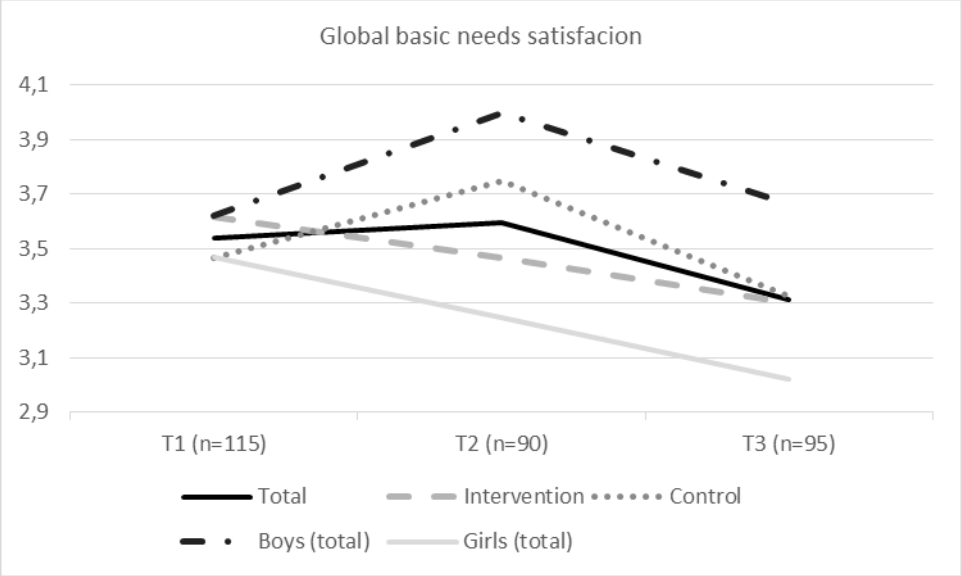

Figure 7. Mean values of global basic needs satisfaction at baseline (T1), midpoint (T2), and endpoint (T3), for the total sample, the intervention group, the control group, boys (total), and girls (total).

There was a credible change in controlled motivation between baseline and endpoint, which decreased by 0.16 per year[14]. Changes in controlled motivation between baseline (T1) and endpoint (T3) are illustrated in Figure 8. Model 3 showed best fit to the data (see Table 2 in Appendix 3). Model 3 demonstrated that the intervention and control group had similar values on controlled

[10] β = -0.09 [95% CI = -0.20; 0.02].
[11] There was no credible effect of the intervention condition on either intercept (β = -0.09 [95% CI = -0.33; 0.16]) nor slope (β = -0.21 [95% CI = -0.14; 0.64]).
[12] Sex had a credible effect on the intercept (β = 0.26 [95% CI = 0.01; 0.54]), but no effect on the slope (β = 0.37 [95% CI = -0.01; 0.76]).
[13] See CI and the relatively large effect size for sex as a predictor for the slope.
[14] β = -0.16 [95% CI = -0.26; -0.06].

motivation at baseline and that the decrease in controlled motivation was similar between the two groups[15]. There was a tendency, however, that the intervention group decreased more in controlled motivation compared to the control group[16]. Model 3 also showed that boys had higher controlled motivation at baseline compared to girls, the decrease in controlled motivation was, however, similar between boys and girls[17].

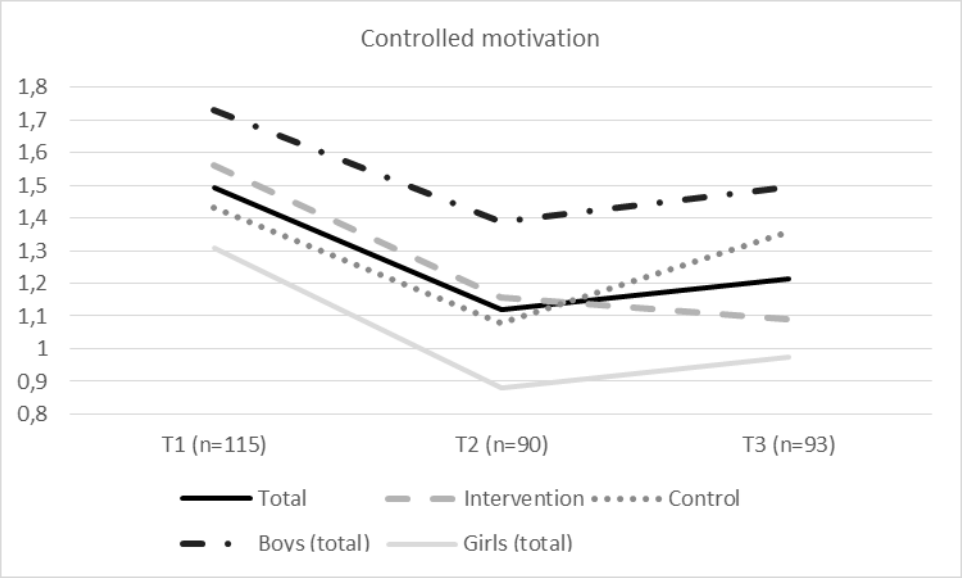

Figure 8. Changes in controlled motivation, between baseline (T1) and endpoint (T3), for the total sample, the intervention group, the control group, boys (total), and girls (total). The figure shows the mean values for controlled motivation.

There was also a credible change in autonomous motivation between baseline and endpoint, which decreased by 0.12 per year[18]. Changes in autonomous motivation between baseline (T1) and endpoint (T3) are shown in Figure 9. Model 3 showed best fit to the data (see Table 3 in Appendix 3). Model 3 revealed that that the intervention and control group had similar values on autonomous motivation at baseline and that it decreased similarly for both groups over time[19]. Nevertheless, autonomous motivation tended to decrease

[15] There was no credible effect of the intervention condition on either intercept (β = -0.17 [95% CI = -0.46; 0.12]) nor slope (β = 0.17 [95% CI = -0.01; 0.35]).
[16] See the CI and the fairly large effect size for the intervention condition as a predictor for the slope.
[17] Sex had a credible effect on the intercept (β = 0.34 [95% CI = 0.12; 0.57]), but no effect on the slope (β = 0.10 [95% CI = -0.28; 0.48]).
[18] β = -0.12 [95% CI = -0.24; -0.01]
[19] There were no credible effect of the intervention condition on either intercept (β = -0.13 [95% CI = -0.35; 0.11]) nor slope (β = 0.34 [95% CI = -0.01; 0.82]).

more for the intervention group than the control group[20]. The model also demonstrated that boys had higher autonomous motivation at baseline compared to girls, the decrease in autonomous motivation was, however, similar between boys and girls[21].

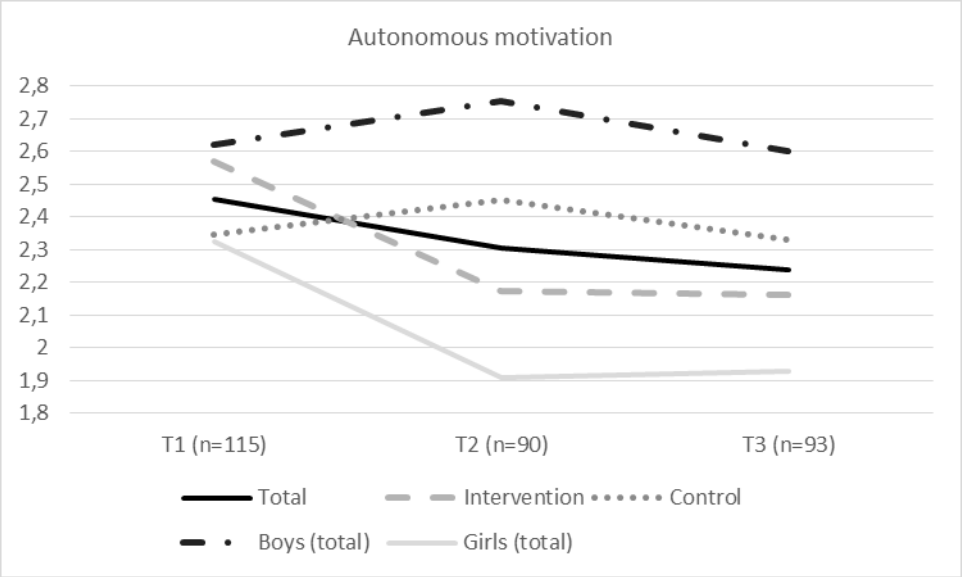

Figure 9. Changes in autonomous motivation, between baseline (T1) and endpoint (T3), for the total sample, the intervention group, the control group, boys (total), and girls (total). The figure shows the mean values for autonomous motivation.

There was a credible decrease in MVPA, amounting to about 6.6 minutes less daily MVPA per year between baseline and endpoint[22]. Changes in MVPA between baseline (T1) and endpoint (T3) are displayed in Figure 10. Model 4 showed best fit to the data (see Table 4 in Appendix 3). The model showed that the intervention group accumulated more MVPA at baseline compared to the control group, the decrease in MVPA over time, however, was similar between the two groups[23]. Further, the model demonstrated that boys accumulated more MVPA at baseline compared to girls. The decrease in MVPA over time however, was similar among boys and girls[24].

[20] See the CI and the rather large effect size for the intervention condition as a predictor for the slope.
[21] Sex had a credible effect on the intercept (β = 0.31 [95% CI = 0.07 0.54]), but no effect on the slope (β = 0.33 [95% CI = -0.07; 0.75]).
[22] β = -6.58 [95% CI = -8.64; -4.49]
[23] There was a credible effect of the intervention condition on the intercept (β = -0.20, 95% CI = [-0.37; -0.01]), but no credible effect of the intervention condition in the slope (β = 0.18, 95% CI = [-0.18; 0.56]).
[24] There was a credible effect of sex on the intercept (β = 0.34 [95% CI = 0.16; 0.50]), but no credible effect of sex on the slope (β = -0.01, 95% CI = [-0.37; 0.34]).

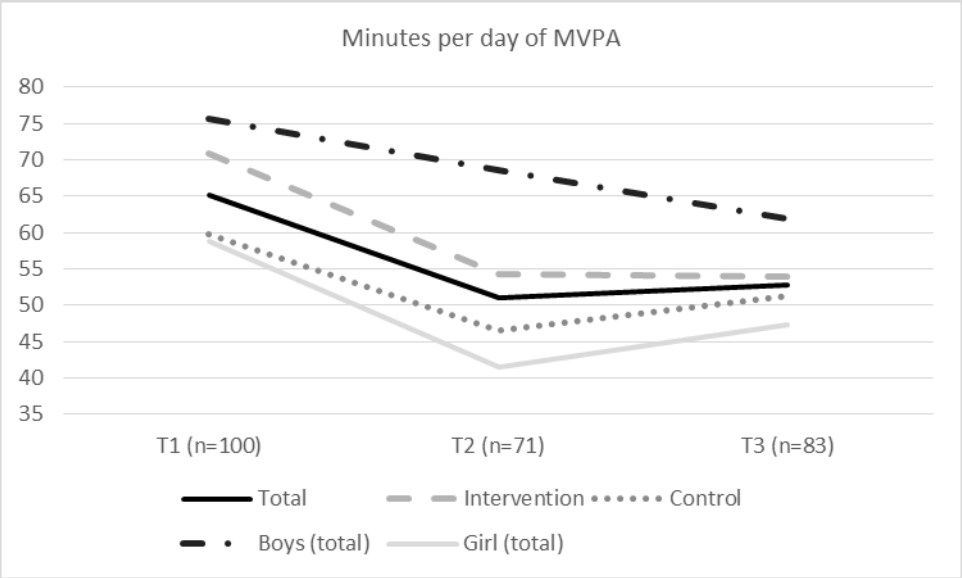

Figure 10. Changes in minutes per day of moderate-to-vigorous physical activity (MVPA), between baseline (T1) and endpoint (T3), for the total sample, the intervention group, the control group, boys (total), and girls (total). The figure shows the mean group level of MVPA.

Chapter 7: Discussion

How can the facilitators and undermining factors of the adolescents' physical activity be understood?

When the adolescents talked about physical activity, they mostly mentioned spontaneous physical activities such as playing football with friends. This is somewhat contradictory to previous findings as they show that spontaneous physical activity has declined in Sweden during the last few decades (Centrum för idrottsforskning, 2017). Nevertheless, spontaneous physical activity seems to be an important part of these adolescents' accrued physical activity, as for other adolescents of low SES (see Santos, Esculcas, & Mota, 2004). Further, data extracted from Fröberg and colleagues (2016) study indicated that only 32% of the adolescents in this study were active in sport clubs, compared to 64% as shown by Centrum för idrottsforskning (2017). Hence, the adolescents in this study appears to be less active in organized sport clubs compared to Swedish adolescents in general, which is unfortunate since participation in sport clubs is considered beneficial to democracy, equality, and public health (SOU, 2008).

The influence of family, friends, and the environment

On the one hand, the adolescents explained that both their parents and friends are important for their physical activity engagement, which is consistent with previous findings, which have shown that social support from family and friends are associated with adolescents' physical activity (Mendonca et al., 2014). From an SDT-perspective, social support from family and friends is similar to interpersonal involvement (Ryan & Deci, 2017), which has been shown to promote relatedness satisfaction (Vansteenkiste, Niemiec, & Soenens, 2010). Arguably, social support thus facilitates the adolescents' feelings of relatedness, which in turn increases the likelihood of the adolescents internalizing their physical activity behavior (see Ryan & Deci, 2017). Additionally, when the adolescents spoke about being active with friends, they mentioned that they had to it, which can be interpreted as some sort of peer pressure, as they do not

want to let their friends down. It appears that the adolescents, to some extent, are motivated through introjection (i.e., trying to avoid feelings of guilt and/or anxiety) to be physically active (Ryan & Deci, 2017). In previous studies, introjected regulation has been negatively (Owen et al., 2014) as well as positively (Gillison et al., 2009) associated with adolescents' physical activity. Although controlled motivation, such as introjected regulation, has been related to maladaptive psychological functioning (Ryan & Deci, 2000a; 2017), controlled motivation can aid the internalization of behaviors (Deci, Eghrari, Patrick, & Leone, 1994), such as physical activity. On the other hand, the adolescents' stories revealed that lack of social support from friends and family undermined their physical activity, which is consistent with previous studies (Martins et al., 2015). From the perspective of SDT, the adolescents' statements regarding lack of social support, might be manifested as lack of interpersonal involvement from family and friends, and as such, thwarting the adolescents' need for relatedness (see Vansteenkiste et al., 2010). The adolescents' wishes about their family being more supportive of their physical activity might indicate that the adolescents prefer if their parents are autonomy supportive, rather than controlling, which theoretically makes sense (see Ryan & Deci, 2017 and Vansteenkiste et al., 2010). Obviously, it will be challenging for unaccompanied refugee adolescents, for example, to experience social support from their family in relation to physical activity, and it might be difficult for single parents to provide their adolescents with sufficient support. Furthermore, the adolescents' statements regarding lack of financial support from their parents, which made it difficult for them to join a sports club, might according to Martins et al. (2015), be specific for adolescents of low SES. Similarly, adolescents in Gothenburg of lower SES need to refrain from leisure-time activities more often than adolescents of higher SES since they cannot afford it (Göteborgs Stad, 2017).

The adolescents in this study mentioned that they would like more and/or longer PE lessons, which is in line with intensive debate regarding PE in Sweden at the moment, as the Swedish government recently proposed that PE in elementary school will receive 100 more hours of teaching (Regeringskansliet, 2017). The adolescents also wished for more influence over the content of the PE lessons, which can be interpreted as they desire that their PE teachers are autonomy supportive (see Van den Berghe et al., 2014). The idea of the adolescents having more influence over the content of the PE lessons might seem to contradict the fact that PE is a theoretical subject and the teachers have

curricula they need to follow (Jonsson, 2019a). The National Agency for Education in Sweden does, however, acknowledge that teachers should take into account the needs, conditions, experiences and thinking of each individual and that teachers should answer for the students to have a real influence on working methods and the content of teaching (Skolverket, 2016). Consequently, it is difficult, if not impossible, for PE teachers to realize these expectations if they do not, to some extent, act in autonomy supportive ways (Jonsson, 2019b). Further, an autonomy supportive approach does not emphasize what is being taught, it rather focuses on how it is being taught (Jonsson, 2019b).

Additionally, the adolescents stated that long short breaks in school and long distances to sports clubs undermined their physical activity, which is similar to what previous studies has shown (Martins et al., 2015; Pawlowski et al., 2014). With regard to the environment, researchers in previous studies with adolescents of low SES have mentioned safety concerns in their neighborhood as undermining their physical activity (Rawlins et al., 2013). This was, however, not mentioned by the adolescents in this study. Nevertheless, residents in the area of Angered have reported a relatively high unwillingness to spend time alone outside for fear of being attacked, robbed or otherwise harassed (Göteborgs Stad: Social resursförvaltning, 2014). This might also be the case for the adolescents, or their parents/legal guardians may not allow them to spend time outside alone due to safety concerns, even though the adolescents did not mention it during the focus groups. Lastly, the adolescents revealed that inclement weather undermined their physical activity, which has also been shown in previous studies (Anshel, 2006; Martins et al., 2015). It has been argued, however, that inclement weather might be an excuse to avoid physical activity, and that the adolescents may rather prioritize other leisure-time activities (see Anshel, 2006).

Gender norms and demands sets the agenda

When discussing physical activity, some of the adolescents mentioned that boys are more physically compared to girls. This view was not shared by all the adolescents, needless to say, research shows that boys are usually more physically active (Cooper et al., 2015; Kalman et al., 2015) and more active in sports clubs than girls (Centrum för idrottsforskning, 2017). Further, baseline data showed that 24% of the boys and only 6% of the girls in this study were physically active enough to comply with contemporary physical activity

recommendations (Fröberg et al., 2016). In relation to this, some of the girls stated that they do not engage in physical activity because physical activity is for boys and not for girls, and since girls do not possess the necessary skills. The girls' description of physical activity being a masculine pursuit might be considered a symbolic boundary (Lamont & Molnár, 2002), which undermines some of the girls' physical activity. In a similar vein, adolescent girls in a study by Spencer and colleagues (2015) recognized that there exists a male dominance in sports and that sport is mainly for boys. Additionally, Spencer et al. (2015) maintains that girls' relationship to physical activity is highly complex. More specifically, on the one hand, girls might feel obliged to appear and act feminine, which in turn restricts them from behaving outside gender norms. On the other hand, some girls might challenge such norms, but in doing so, risk being perceived as masculine (Spencer et al., 2015). From a SDT-standpoint, the symbolic boundary that entails that physical activity is a masculine pursuit, can be understood as thwarting the adolescent girls' needs for autonomy and competence. On the one hand, it may limit the girls' available options concerning physical activities, as they may not want to engage in activities that are considered masculine, and as such, thwarts their need for autonomy. On the other hand, if the girls internalize the perception where physical activity is considered to be something only boys are competent at, it may thwart their need for competence (see Ryan & Deci, 2017). Furthermore, the adolescent girls in the present study highlighted a social boundary in which sports receives an unequal distribution of resources (Lamont & Molnár, 2002). More specifically, the girls noted that women's sports gets less attention and less media coverage compared to men's sports (see Packer et al., 2015). The notion of physical activity being a masculine pursuit might also be maintained by the adolescents' parents/legal guardians, as, for instance, some individuals of Muslim faith believe that physical activity is prohibited for women (Caperchione, Kolt, & Mummery, 2009). Nonetheless, this was not mentioned by the adolescents in the focus groups.

When one of the boys mentioned that he likes to dance, the other adolescents burst into laughter and it is possible that the adolescents share the idea of dance being a feminine pursuit (see Gard, 2001). By challenging this symbolic boundary (i.e., gender labelled activity), however, it might be understood as a facilitating feature for other boys who like to dance but are afraid to do so. Challenging norms might therefore facilitate their physical activity engagement. From the perspective of SDT, it can be interpreted as boys

who challenge this symbolic boundary express their volition and thereby satisfy their need for autonomy (cf. Vansteenkiste et al., 2010).

The adolescents revealed that household chores and school homework undermined the girls' physical activity. This did not, however, seem to be the case for the boys. This seems to be consistent with earlier studies which have shown that household chores (Humbert et al., 2008) and school homework (Humbert et al., 2008) undermine girls' physical activity. With regard to the household chores, this might be specific for adolescents of low SES. Previous studies have shown that household chores undermines the physical activity of both girls (Humbert et al., 2008) and boys (Dagkas & Stathi, 2007) in low SES areas but does not affect the physical activity of adolescents in high SES areas (Dagkas & Stathi, 2007; Humbert et al., 2008). In relation to both household chores and school homework, the adolescents revealed that there might exist a symbolic boundary (Lamont & Molnár, 2002), which separates girls from boys, and places greater demands on girls' household chores as well as their academic performance compared to that of boys. This symbolic boundary may also thwart adolescent girls' need for autonomy, as they might want to engage in more physical activity but these obligations hinder them (cf. Ryan & Deci, 2017). The adolescents also revealed that lack of time undermined their physical activity, which has also been shown in previous studies (Anshel, 2006; Martins et al., 2015). It has been argued, however, that perceived lack of time might be an excuse to avoid physical activity, and that adolescents may simply prioritize other leisure-time activities (see Anshel, 2006).

The girls' concerns about their looks in relation to physical activity are in line with previous findings (e.g., Spencer et al., 2015). It is possible that the girls highlight a symbolic boundary (Lamont & Molnár, 2002), which entails that girls should uphold a good appearance while engaging in physical activity. Such appearance fixation might undermine girls' willingness to be physically active as it may challenge their femininity (see Spencer et al., 2015) as well as thwart their need for autonomy (cf. Ryan & Deci, 2017).

Possibilities for enjoyment and interactions

The adolescents declared that physical activity should be fun for them to engage in, which is consistent with previous studies (Humbert et al., 2008; Whitehead & Biddle, 2008). The perception of having fun is also closely related to intrinsic motivation (Ryan & Deci, 2017). A meta-analysis by Owen and colleagues

(2014) found that autonomous motivation was associated with children's and adolescents' physical activity, which indicate the importance of engaging in physical activities that the adolescents find enjoyable and meaningful. In relation to this, the adolescents mentioned three aspects that made physical activity fun, namely, variation and options, feelings of competence, and being physically active with friends. These aspects have also been highlighted in previous studies as contributing to adolescents' physical activity engagement (Humbert et al., 2008; Martins et al., 2015; Whitehead & Biddle, 2008). Variation and options, feelings of competence, and being active with friends is closely related to the basic needs of autonomy, competence, and relatedness, respectively (see Ryan & Deci, 2017). Consequently, it makes sense that these aspects make adolescents' physical activity fun, since basic psychological needs satisfaction promotes intrinsic motivation (Ryan & Deci, 2017). It is important to note however that, according to Ryan and Deci (2000a), relatedness satisfaction is only related to intrinsic motivation in a more distal sense. For example, some quantitative studies have not found any significant associations between relatedness satisfaction and adolescents' autonomous motivation towards physical activity and PE (e.g., Standage, Gillison, Ntoumanis, & Treasure, 2012). The findings of the present study, however, support the notion of relatedness satisfaction being vital for the adolescents' intrinsic motivation in relation to physical activity.

Even though some of the adolescents revealed that physical activity was a considered a masculine pursuit, some of the girls mentioned that they enjoyed playing basketball, since they were good at it. Thus, competence satisfaction might facilitate the girls' tendency to challenge symbolic boundaries (Lamont & Molnár, 2002) associated with physical activity and promote their physical activity engagement. Furthermore, when the adolescents discussed feelings of competence they did not focus on performance outcomes, such as, winning. They rather talked about have fun and doing their best. Consequently, it is problematic that sports clubs generally emphasize a win-at-all-costs mentality and focus on performance outcomes (see Burgess & Naughton, 2010; Lindgren, Hildingh, & Linnér, 2017). Similarly, Martins and colleagues (2015) found that adolescents perceive a performance-oriented environment as lacking fun. Accordingly, sports clubs in Sweden can become better at respecting adolescents' views, rather than emphasizing performance outcomes (see Lindgren, Hildingh, & Linnér, 2017), especially since the Convention of the

Rights of the Child will become law in Sweden by 2020 (Government Offices of Sweden, 2018).

The adolescents discussed screen-based activities in depth, and specifically how it undermined their physical activity, which has also, at least to some extent, been highlighted in previous studies (e.g., Martins et al., 2015). Some of the adolescents mentioned that it is fun to interact and play games with their friends through smartphones and computers for example. Subsequently some of the adolescents might be intrinsically motivated to engage in screen-based activities, as they refer to it as fun, which from a SDT-viewpoint is logical (see Vansteenkiste et al., 2010), since they engage in an activity that they perceive as inherently satisfying. Some of the adolescents, however, talk about the screen-based activities more in terms of pastime, and how it became a way to interact with their friends. Nevertheless, in both cases it can be understood as the screen-based activities serves as a way of satisfying the adolescents' need for relatedness, as they can feel connected with others (see Ryan & Deci, 2017).

What were the possibilities and challenges in developing and implementing the intervention?

The intervention was continuously developed and implemented through shared decision making and collaboration between the researchers and the adolescents. The researchers' experiences suggests that there were several prerequisites that made it possible to continuously develop and implement the intervention (meeting notes, 17 June 2015, 13 October 2015). The school personnel (i.e., homeroom teachers and principal) were highly cooperative and appeared to share the researchers' ambitions of involving the adolescents in developing and implementing the intervention. The researchers believe that the good cooperation with the school personnel was a necessity for being able to continuously develop and implement the intervention together with the adolescents. Moreover, the intervention activities were implemented during school hours and the intervention activities were integrated into the adolescents' ordinary school schedule. The researchers consider that the scheduling of the intervention also facilitated the process of developing and implementing the intervention, and contributed to the fact that the intervention could reach all the adolescents. The researchers also experienced that the adolescents were generally curious and eager to learn about the intervention activities and to become involved in the decision making process (meeting

notes, 17 June 2015). The adolescents' curiosity and eagerness developed over time and, as such, the researchers believe that it is essential to build relationship and trust with the adolescents to be able to successfully develop and implement an empowerment-based intervention. As the adolescents had both (un)realistic and (un)healthy suggestions regarding the intervention activities, the researchers believe that it was beneficial to combine a bottom-up and down-down approach towards empowerment (i.e., the reflective equilibrium community empowerment approach; Braunack-Mayer & Louise, 2008). In doing so, the researchers avoided implementing activities that they thought were unrelated to or counter-productive at achieving the aim of facilitating the adolescents healthy habits regarding food and physical activity (e.g., travelling to Barcelona to watch a football match). Moreover, by acknowledging the need for evidence-based health information, the researchers encouraged the adolescents to engage in critical discussions when they suggested intervention activities that were considered unhealthy, and to identify options that were healthier.

During the course of the intervention, the adolescents expressed several positive experiences of participating in the intervention, such as, being involved in the decision making process, feeling listened to, and being taken seriously and treated with respect. By being involved in the decision making process, the researchers experienced that the adolescents took responsibility, and became better at collaborating with their peers (meeting notes, 17 June 2015). The adolescents conveyed that they especially enjoyed different practical activities such as playing sports, which they also expressed aided their skill development. By engaging in a variety of intervention activities, some of the adolescents stated that they had removed some barriers related to similar activities during their leisure time, such as going to the gym. From an empowerment- and SDT-perspective, the adolescents expressed experiences similar to some of the empowerment goals (e.g., increased self-confidence and autonomy; see Tengland, 2007) as well as increased satisfaction of the basic psychological needs for autonomy (e.g., feeling listened to), competence (e.g., increased skill development), and relatedness (e.g., collaborating with their peers; see Ryan & Deci, 2017)

At the same time, the researchers faced several challenges that undermined the facilitation of participation and empowerment. At times, the school environment was somewhat chaotic, and during the course of the intervention several incidents occurred such as fights between students (GP, 2015b), vandalism (GP, 2015a), and arson (SVT, 2016). As a consequence, after these

incidents, the researchers experienced that there was an anxious atmosphere at the school and that the adolescents' had difficulties concentrating on the task at hand. In order to be able to continuously develop and implement the intervention together with adolescents, the researchers relied on health coaching. As seen by the results, however, the health coaching was not always received by the adolescents as intended and the researchers faced several challenges. The researchers experienced that the adolescents appeared to live and act for the present moment, and that they had limited interest in expressing and working towards both short- and long-term goals (meeting notes, 17 June 2015). This might be explained by the fact that adolescents, compared to younger adults, have a relative lack of future orientation (i.e., the ability to set future goals and plans) and a preference for immediate, small rewards rather than larger rewards, received in a more distant future (Lindstrom Johnson, Blum & Cheng, 2014; Steinberg et al., 2009). Moreover, some of the adolescents had difficulties with remembering their goals from one occasion to the next. Consequently, on the one hand, it might be more fruitful use health coaching with older adolescents, as the capacity for setting goals increased with age (Sawyer et al., 2012). On the other hand, it might be more appropriate to implement individual health coaching with younger adolescents, as individual health coaching may eliminate the role of group dynamics and potential competing interests among the adolescents (Armstrong et al., 2013).

During phase three, one all boys group mainly wanted to play football, and another with only girls primarily wanted to dance. Similarly, during phase four, all but two boys chose the theme group focusing on ball-games and the theme group involving school-based assignments consisted of only girls. In line with the results of the focus group interviews, it is possible that the boys felt compelled to choose activities that were considered masculine (i.e., ball-games; see Spencer et al., 2015). Whilst the girls might have felt compelled to choose activities that were considered feminine (i.e., dance; see Gard, 2001) or to choose school-based assignments since there are generally greater expectations on girls' academic performance (cf. Humbert et al., 2008). On the other hand, four girls chose the theme group focusing on ball-games, even though some of the girls in the focus groups stated that football was considered a masculine pursuit. In line with the results of the focus groups, it is possible that these girls had high levels of perceived competence which made them more inclined to challenge such gender norms.

As stated previously, at the end of phase four, the researchers handed over a letter to the school principal stating the adolescents' wishes in relation to the school environment. These wishes included a drinking fountain in the school corridor, a reinstatement of the food council and the school café. During our presence at the school, none of these wishes were realized. It is possible that the school board did not approve of these suggestions or assessed that resources were missing to implement these proposed measures. Needless to say, we were unable to achieve these changes in the school environment. Consequently, from a transformative (see Chilisa & Kawulich, 2012; Creswell & Plano Clark 2011) and empowerment (Tengland, 2008; 2012) perspective, we did not reach all the way and the adolescents might have felt that they were not being listened to.

According to the European Union's and Save the Children International's definition of child poverty (i.e., households with children who have a disposable income below 60 percent of median income), a majority of the children in the residential area of the intervention school is living under conditions that can be classified as child poverty (Göteborgs Stad, 2014). Moreover, adolescents in Swedish low SES communities generally perceive themselves as subordinate or feel that they are 'outside' the normal society (Beach & Sernhede, 2011). Given these circumstances, the intervention's focus on physical activity and food habits might have been perceived as secondary or unimportant to the adolescents. Consequently, as stated previously, if we had adopted a pure bottom-up approach towards empowerment, the adolescents might have identified other concerns as more important.

What were the effects of the intervention?

There were no credible intervention effects on the adolescents' basic needs satisfaction, controlled motivation, autonomous motivation or MVPA. Given that there were no credible intervention effects on either basic needs satisfaction or autonomous motivation, it is not surprising that no intervention effects were observed for MVPA, since basic needs satisfaction (Ntoumanis & Standage, 2009) and autonomous motivation (Owen et al., 2014) has been associated with adolescents' physical activity. In other words, from an SDT-perspective, it is stipulated that the intervention's effects are explained through increased basic needs satisfaction, which in turn predicts autonomous motivation, which finally predicts physical activity (i.e., intervention effects on

physical activity are mediated through increased autonomous motivation; see Teixeira, Carraça, Markland, Silva, & Ryan, 2012). Although there seems to be a scarcity of empowerment-based interventions using SDT-based constructs to evaluate intervention effects, the intervention described in this thesis shares some similarities with the intervention of Wilson and colleagues (2005). More specifically, Wilson and colleagues implemented a four-week student-centered intervention to increase physical activity in underserved adolescents. Although the intervention of Wilson et al. was not as extensive and not continuously developed as the 'How-to-Act?'-intervention, the adolescents had the opportunity to choose which physical activities to engage in three times a week after school hours. The results of the study showed that adolescents in the intervention group reported stronger motivation to be physically active and accumulated significantly more accelerometer-measured MVPA compared to adolescents in the control group (Wilson et al., 2005). In a similar vein, several SDT-based interventions that have trained PE teachers to become more autonomy supportive, have shown positive intervention effects on children and adolescents' basic needs satisfaction and autonomous motivation (e.g., Cheon, Reeve, & Moon, 2012; Cheon & Reeve, 2013), as well as accelerometer-measured MVPA (e.g., Perlman, 2013). Moreover, some empowerment-/participatory-based interventions have improved other constructs related to adolescents' physical activity such as self-efficacy (e.g., Lindgren et al., 2011; Verloigne et al., 2017).

Hence, the effects of the 'How-to-Act?'-intervention seem to contradict the abovementioned interventions, especially since there was also a tendency, albeit not credible, that both controlled motivation and autonomous motivation decreased more for the adolescents in the intervention group compared to the adolescents in the control group. It is important to note, however, that two recent meta-analyses of school-based physical activity interventions showed no effects on adolescents' accelerometer-measured physical activity (Borde et al., 2017; Love, Adams, & van Sluijs, 2019). In that sense, the results of the 'How-to-Act?'-intervention are in line with previous reviews and meta-analyses. Nevertheless, there might be several explanations for why there were no intervention effects of the 'How-to-Act?'-intervention on the adolescents' basic needs satisfaction, controlled motivation, autonomous motivation or MVPA.

First, the Swedish versions of the instruments used to measure basic needs satisfaction and motivation have only been validated with adults (Weman-Josefsson, Lindwall, and Ivarsson, 2015) and not adolescents. Thus, it is

possible to question the instrument's validity and reliability when using it with adolescents. Second, the adolescents completed a relatively large questionnaire, consisting of 28 pages, and the instruments for measuring basic needs satisfaction and motivation were placed at the end of the questionnaire (starting on page 21). Consequently, the placement of the instruments at the end of the questionnaire might also have affected the instruments' reliability, as the adolescent might have answered the questions at random. Speculatively, the analysis might have revealed other results if the instruments to measure basic needs satisfaction and motivation had been adapted and validated on adolescents, and had been placed at the beginning of the questionnaire.

Third, the intensity of the intervention, both in terms of health promotion sessions per week and the fact that not all health promotion sessions did not focus on physical activity, might not have been enough to elicit any changes in the adolescents' basic needs satisfaction, motivation, and accelerometer-measured MVPA. For example, the intervention by Wilson and colleagues (2005), as described above, offered intervention activities three times a week. Accordingly, to yield changes in adolescents' basic needs satisfaction, motivation, and accelerometer-measured MVPA, interventions of more intensity (i.e., more intervention activities) might be needed.

Fourth, the teachers, which the adolescents met on a daily basis, did not receive any formal training in the coaching approach (including the PE teachers). The main reason for this was the fact that the adolescents did not explicitly express that they wanted their teachers to be involved in the intervention or change anything about their teachers' approaches. As mentioned previously however, the home-room teachers assumed chief responsibility for theme groups 3 and 4 during phase four due to practical reasons. Nevertheless, in retrospect, it might have been fruitful to involve the teachers even more in the intervention and to offer them, especially their PE teachers, formal training in health coaching and how to provide the adolescents with autonomy support, structure, and interpersonal involvement (see Cheon, Reeve, & Moon, 2012; Cheon & Reeve, 2013; Perlman, 2013).

Fifth, the adolescents' parents were not involved in the intervention, mainly due to the fact that the homeroom teachers noted language barriers and lack of time and/or interest among the parents. The teachers' experiences were also confirmed when the researchers attended a parents meeting to present the 'How-to-Act?'-project. Only a handful of parents' showed up and an interpreter was present to help the parents with translation. Given that the adolescents

stated that they desired more support from their parents in relation to their physical activity (see paper I & II), and that previous studies have shown that dyadic interventions (Carr et al., 2019)/interventions involving family (Brown et al., 2016) have the potential to increase children's and adolescents' physical activity, it might have been valuable if the researchers had devoted more efforts into trying to involve the adolescents' parents in the intervention.

Sixth, due to the limited numbers of available accelerometers, the measurement of MVPA (i.e., at baseline, midpoint, and endpoint) at the intervention school and the two control schools was carried out one to two week(s) apart. Related to this, weather data retrieved from the Swedish Meteorological and Hydrological Institute (SMHI) revealed relatively large differences in precipitation between the three schools at the time of endpoint measures. More specifically, during endpoint measures at the intervention school, the total amount of precipitation was 20.6 mm, and the corresponding precipitation during endpoint for the two control schools was 0.0 mm and 6.1 mm, respectively. Seeing as previous research have shown that precipitation is negatively associated with physical activity (Harrison, et al., 2017), the differences in precipitation at the three schools during endpoint might have affected the results.

Although the intervention had no effects on the adolescents' basic needs satisfaction, motivation, or MVPA, it is possible that the intervention had effects on other constructs, that was not assessed quantitatively, related to the goals of empowerment (e.g., well-being, self-confidence, self-control, knowledge; see Tengland 2007; 2008). Additionally, as described previously, during the course of the intervention, the adolescents expressed several benefits of participating in the intervention, which was also supported in focus group interviews conducted with the adolescents after the intervention had ended (Holmberg et al., 2018). More specifically, the adolescents conveyed that they felt listened to, experienced the intervention as engaging and fun, became better at collaborating with their peers, developed their physical activity knowledge and skills, and became more aware of their own physical activity (Holmberg et al., 2018). Consequently, from an empowerment- (Tengland 2007; 2008) and children's right (United Nations Human Rights, 2016) perspective, the intervention was successful at involving the adolescents in the decision making process and giving them voice in a process that is usually dominated by adults (i.e., researchers; see Larsson et al., 2018).

The effectiveness of school-based physical activity interventions

If the sole purpose of school-based physical activity interventions is to promote physical activity, we might need to ask ourselves if it is ethically justifiable to continue to implement these interventions as it is evident that they do not have the desired effects (see Borde et al., 2017; Love, Adams, & van Sluijs, 2019). Some researchers have even gone so far as to state that we cannot modulate children's physical activity, based on the 'activitystat' hypothesis (Wilkin, 2011). Simply put, the activitystat hypothesis stipulates that if adolescents increase their physical activity in one context (e.g., school) it will decrease in another context (e.g., leisure-time), or, if adolescents accumulate more physical activity on a given day, they will compensate on another day. Other researchers disagree, however, and advocate for greater efforts into physical activity interventions (Reilly, 2011). In relation to this, it is possible to question whether more of the same (i.e., school-based physical activity interventions) will produce different results. Or, as elegantly put by Forscher (1963) in his letter to Science:

> ...production emphasized those types of brick that were easy to make and only rarely did an adventuresome brickmaker attempt a difficult or unusual design. ...It became difficult to find a suitable plot for construction of an edifice because the ground was covered with loose bricks. It became difficult to complete a useful edifice because, as soon as the foundations were discernible, they were buried under an avalanche of random bricks. And, saddest of all, sometimes no effort was made even to maintain the distinction between a pile of bricks and a true edifice (p. 339).

Although the 'How-to-Act?'-intervention might have been carried out by adventuresome brickmakers (given the challenging design of the intervention as well as the context), the resulting bricks showed similar results to those of other brickmakers (i.e., no effect of the school-based intervention[25]). As seen by the results of this thesis, as well as other scholars (e.g., Martins et al., 2015), adolescents' physical activity engagement is complex and affected by a multitude of factors at an individual level (e.g., gender, age, motivation), social level (e.g., friends, family), environmental level (e.g., green spaces, sports grounds, schools), and societal level (e.g., gender norms, policies). Consequently, if we wish to achieve substantial change in adolescents' physical

[25] Note that the systematic reviews and meta-analyses by Borde et al (2017) and Love, Adams, and van Sluijs (2019) had not been published when the 'How-to-Act?'-project was initiated.

activity, it appears counterproductive to put all our eggs in one basket and concentrate our efforts on one context (i.e., schools; see Love, Adams, & van Sluijs, 2019). To succeed in promoting adolescents' physical activity, we need multidimensional intervention approaches across contexts (Love, Adams, & van Sluijs, 2019). There are some brickmakers who have been successful at promoting adolescents' physical activity by mainly focusing on one or two of the abovementioned levels, and we can learn from these efforts when designing future multidimensional intervention approaches across contexts. For example, motivational interviewing (MI) at an individual level (Cushing, Jensen, Miller, & Leffingwell, 2014), dyadic interventions at a social level (Carr et al., 2019), even some school-based interventions (e.g., Sutherland et al., 2016), and policies targeting schools (e.g., teacher training; Pate et al., 2011)[26] appear to have potential in promoting adolescents' physical activity. It will of course be challenging to create such multidimensional intervention approaches across contexts since there are so many random bricks available[27], and because it will require cooperation between several key stakeholders (e.g., the adolescents, researchers, parents, school personnel, healthcare professionals, politicians).

Even though previous school-based interventions, as well as the 'How-to-Act?'-intervention, has not resulted in the desired effects on adolescents physical activity, there are other obvious merits of these interventions. For example, physical activity interventions with children and adolescents, that have evaluated outcomes other than physical activity, have shown improvements in cardiometabolic health, aerobic and muscular fitness, bone health (Poitras et al., 2016), self-esteem, cognitive functioning, and reduced anxiety and depression (Biddle & Asare, 2011). Thus, the purpose here is not to question the utility of school-based physical activity interventions in general, only in relation to their effectiveness at actually promoting adolescents' physical activity, as stated initially.

From an empowerment-, SDT-, and children's right perspective, it is also essential to note that we cannot "force" adolescents to engage in physical activity. Some adolescents may not want to, for several reasons, increase their physical activity. As researchers and practitioners, we then need to respect their decisions and their right to self-determination. We can only create supportive

[26] Note that the reviews by Cushing et al (2014), Carr et al (2019), and Pate et al (2011) included studies with both self-report and objective measures of physical activity (with the majority of studies using self-report measures), which means that the results should be interpreted with caution.

[27] For example, the following search string "(((("adolescent") OR "youth") OR "children") AND "physical activity"" yielded 28,859 hits in PubMed on the 14th of February, 2019.

environments which encourage adolescents to be physically active (see Ryan & Deci, 2017).

Chapter 8: Method discussion

From a children's right perspective (United Nations Human Rights, 2016), one of the focal merits of papers I and II is the fact that the adolescents had the opportunity to make their voices heard and to express themselves freely during the focus group interviews (Dahlin Ivanoff & Hultberg, 2006). In order to increase trustworthiness of paper I and II, the recommendations of Graneheim, Lindgren & Lundman (2017) were followed. Firstly, when presenting the results, the researcher has aimed to clearly illustrate when the adolescents' voices are presented and when the researchers have interpreted the adolescents' statements. Further, several conscious steps were taken in order to ensure credibility, authenticity, dependability, and transferability (i.e., trustworthiness; Graneheim, Lindgren, & Lundman, 2017) of the studies. More specifically, to achieve credibility, the researchers invited all seventh graders at the intervention school to participate in the focus groups interviews. All 54 adolescents agreed to partake, one adolescent, however, were absent during his scheduled focus group interview. Given the research question for paper I and II, it could have been possible for the researchers to invite the adolescents from the control schools as well. The overreaching transformative mixed methods design of this thesis, however, aimed to advance the needs of the adolescents in the intervention school, and the preliminary results from the focus group interviews was intended to inspire the development and implementation of the intervention (see Creswell & Plano Clark, 2011). Consequently, if the researchers had included adolescents from the control schools as well, the researchers might have focused on developing and implementing intervention activities that had not been voiced by the adolescents from the intervention school.

A limitation with regard to credibility and authenticity is the fact that the researchers experienced that the girls were more articulate than the boys, and as a consequence, the girls' voices may be overrepresented in the results (see Graneheim, Lindgren, & Lundman, 2017). When presenting the results, however, the researchers have been transparent with when the quotes are from boys or girls and have attempted to provide an account (i.e., quotes) from as many of the focus group interviews as possible, and the researchers also

included extracts from each of the ten focus group interviews in the analysis to ensure credibility and authenticity. The researchers' intention was to conduct traditional focus group interviews as described in the literature (e.g., Dahlin Ivanoff & Hultberg, 2006). In some of the focus groups interviews, however, we experienced that the adolescents mainly answered our questions and did not engage in joint discussions. One possible explanation concerns the power relations surrounding research interviews (see Greene & Hogan, 2005; Vähäsantanen & Saarinen, 2013). In order words, there were three adults attending each focus groups interview which possibly contributed to a power imbalance. Another shortcoming of study I and II relates to language barriers. More specifically, several adolescents did not speak Swedish fluently, which inhibited their ability to express themselves freely. We were under the impression, however, that all adolescents could talk Swedish fluently as they all were included in the regular teaching, which is carried out in Swedish. Thus, reconsidering, an interpreter might have helped so that more of the adolescents could have expressed themselves freely.

The analysis for paper I and II was carried out by the author of this thesis, in close collaboration with the main supervisor, and the codes, categories, and themes were regularly discussed amongst the co-authors. Similarities and differences between the codes, categories, and themes were discussed until the co-authors would reach consensus, to ensure dependability of the findings (see Graneheim, Lindgren, & Lundman, 2017). In assisting the readers to draw their own conclusions with regard to the transferability of the findings in paper I and II, the researchers has endeavored to introduce a distinct and clear account of the context, the data collection, and the analysis (see Graneheim, Lindgren, & Lundman, 2017). A limitation is, however, the fact that the researchers did not collect any further background information, than age and gender, about the adolescents.

As regarding the methods in paper III, the main strength is the feature of involving the adolescents in the decision making process and in developing and implementing the intervention. This was an essential element of the intervention since it has been suggested that adolescents should be given a stronger voice (Sawyer et al., 2012) and because every adolescent has the right to express themselves and to be heard in matters affecting their health and well-being (United Nations Human Rights, 2016). There are, however, some limitations of the intervention that has to be addressed. First, seeing as both PE teachers (Meng & Keng, 2016; Perlman, 2013) and family (Brown et al., 2016)

has the potential to increase adolescents' physical activity, it can be considered a limitation that they were not involved in the intervention. The main reason for not involving the PE teachers in the intervention was because the adolescents did not explicitly wish for it. While the key cause for not involving the adolescents' families (e.g., parents/legal guardians) was since the homeroom teachers had expressed language barriers and lack of time and/or interest among the parents/legal guardians. Moreover, as shown by papers I and II, since adolescents' physical activity is complex affected by numerous factors, another limitation with the intervention is that it only focused on one context (i.e., school) and the intervention mainly included measures targeting the adolescents' physical activity at an individual and social level. For example, the intervention did not target policies at the school, nor the physical school environment, which both has the potential of increasing adolescents' physical activity (Morton et al., 2016; Pate et al., 2011).

With regard to paper IV, one of the strengths of the study was the use of accelerometers to capture the adolescents' MVPA, since accelerometers are able to provide valid and reliable estimates of adolescents' physical activity (Corder et al., 2008; Reilly et al., 2008), whereas there are issues with validity, reliability, and sensibility when using self-report questionnaires with adolescents (Shephard, 2003 and Warren et al., 2010). Nevertheless, there are some limitations with paper IV that need to be acknowledged. These limitations include the recruitment procedure which lacked randomization to the intervention and control group, the relatively small sample size, the loss of participants between baseline and endpoint which resulted in relatively few adolescents providing data for all three measurements (i.e., 69 and 49 adolescents, out of 135, provided data for basic needs satisfaction/motivation and accelerometer-measured MVPA, respectively, at all three measurement points). Further, the instruments used to assess the adolescents' basic needs satisfaction and motivation has not been validated with adolescents, only adults (see Weman-Josefsson, Lindwall, and Ivarsson, 2015). Another limitation with regard to validity is the fact that some of the adolescents had difficulties talking Swedish fluently, as such, they might have had difficulties understanding the questions/statements in the questionnaire. One adolescent, for example, used Google translate to translate almost every question/statement in the questionnaire to her native language (that questionnaire was excluded from the analysis). The questionnaire in its entirety, including BPNES and BREQ-2, was however pilot-tested to ensure face validity, according to the think aloud

method (Ericson & Simon, 1984), with adolescents at the intervention school. Additionally, to maximize the use of available accelerometer data, the wear-time criterion was set to at least three days with a minimum of eight hours per day of monitoring, without a requirement of weekend data. This can be considered a limitation since most previous studies have required a minimum of three to four days with at least eight to ten hours per day of monitoring (Cain et al., 2013), and due to the fact that adolescents are generally less physical active on weekends (Brooke, Corder, Atkin, & van Slujis, 2014). Lastly, accelerometer-measured physical activity at baseline, midpoint, and endpoint was collected one to two weeks apart at the intervention school and the two control schools. This can be considered a limitation, especially since weather conditions such as precipitation affects adolescents physical activity (Harrison, et al., 2017), and there were large differences in precipitation particularly during endpoint measures, which may have affected the results.

Theoretical considerations

Empowerment

One of the main reasons for framing the 'How-to-Act?'-intervention using empowerment was due to ethical and moral reasons, since the United Nations Convention of the Rights of the Child dictates that all adolescents should have the right to make their voices heard in matters that affect their health and well-being (United Nations Human Rights, 2016). Framing the intervention using empowerment also aligns well with the transformative mixed methods design of this thesis (see Creswell & Plano Clark, 2011). Hence, by embracing an empowerment-based approach, the adolescents had the opportunity to make their voices heard and to be included in the decision-making process (see Shier, 2001; Spencer, 2014). Moreover, it has been proposed that empowerment should be one of the primary goals of contemporary health promotion (Laverack, 2004; Spencer, 2014), and there is also evidence to support the effectiveness of empowerment-based interventions targeting adolescents (see Wallerstein, 2006 for a review). It could have been possible to frame the intervention using other concepts or theoretical frameworks, such as, health literacy (Nutbeam, 2008). It appears that the concept of health literacy has a strong evidence base in clinical settings where lack of health literacy is believed to constitute a risk factor for ill-health (i.e., a pathogenic orientation; Nutbeam,

2008). When health literacy is conceptualized as an asset for promoting individual's health (i.e., a salutogenic orientation), however, the evidence to support this conceptualization is weaker (Nutbeam, 2008). Consequently, given the salutogenic orientation of this thesis, and the fact that there is evidence to support an empowerment-based approach (Wallerstein, 2006), it made more sense to frame the intervention through empowerment rather than health literacy.

According to Tengland (2008; 2012), the goal of an empowerment-based approach is to increase the adolescents ability to control their health and life. Consequently, it is necessary to problematize the opportunities that adolescents have to control and decide upon regarding their own health and life. As mentioned previously, it is common for adolescents to live and act for the present moment and with little concern about the future (Sawyer. 2012), which is evident in their relative lack of future orientation and preference for immediate, small rewards rather than larger rewards, received in a more distant future (Steinberg et al., 2009; Lindstrom Johnson, Blum & Cheng, 2014). Accordingly, adolescents may decide to engage in behaviors that provide them immediate rewards (e.g., smoking or risky sexual behaviors), but that may have detrimental effects on their health in the future. Moreover, adolescents may not have the financial resources they need to engage in behaviors that can promote their health, for example, the adolescents mentioned that lack of financial support from their parents made it difficult for them to participate in organized physical activities (see paper II). Lastly, as revealed by the adolescents in paper I, social support from their family is a prerequisite for them to be able to engage in health behaviors, such as, physical activity. Thus, if the adolescents' families are not socially supportive of their health behaviors, it becomes difficult for adolescents to engage in such behaviors.

Self-determination theory

Further, SDT has constituted an important theoretical framework of this thesis, and SDT has received some critique over the years. Firstly, SDT is mainly concerned with social conditions that can either facilitate or thwart human flourishing (Ryan & Deci, 2017). As such, SDT does not challenge power relations, as the concept of empowerment does (see Labonte, 1994). Consequently, the use of SDT as a theoretical framework does, to some extent, contradict the overarching design of this thesis (i.e., the transformative mixed

methods design), which entails that a transformative framework (e.g., empowerment) should permeate a research project (Creswell & Plano Clark, 2011). Conversely, it is essential to note that SDT has not been used to underpin the design or methods used in this thesis. SDT has only been used as a theoretical framework to aid the interpretation of the findings in paper I, II, and IV. Furthermore, SDT does acknowledge that social systems, such as, culture, political structures, and economic systems affect people's basic needs satisfaction, behavior, well-being, and growth (Ryan & Deci, 2017). Consequently, in this thesis, it is rather seen as a strength that several different theoretical frameworks and concepts have been used to provide a deeper and more nuanced understanding of the phenomenon that has been studied.

Second, as stated previously, within SDT it is stipulated that every person, regardless of gender, age, ethnicity, and culture, has three inherent basic psychological needs (i.e., autonomy, competence, and relatedness; Ryan & Deci, 2017). On the other hand, it has been postulated that the needs are too Western (individualistic) centric and do not apply to Eastern (collectivistic) cultures and scholars have suggested several other needs, such as, meaning, a security need, and self-esteem as a need (see Ryan & Deci, 2017 for an overview). With regard to the proposition that the basic psychological needs do not apply to Eastern or collectivistic cultures, this claim has been rebutted in several studies (e.g., Chen et al., 2015; see also Ryan & Deci, 2017 for a review). More specifically, the study by Chen and colleagues (2015) showed that satisfaction of the basic psychological needs contributed to well-being whereas thwarting of the needs contributed to ill-being across four cultures (i.e., Belgium, China, USA, and Peru). The effects of basic needs satisfaction on well-being and needs thwarting on ill-being was equal across cultures and the effects were not moderated by either need valuation (i.e., the importance of a need to the person) or need desire (i.e., the desire to satisfy a need). Consequently, the study supports the universal claim that basic needs satisfaction contributes to well-being and thwarting of the needs leads to ill-being, regardless of culture and whether the person values the need or desires to satisfy the need (Chen et al., 2015).

Regarding the proposal of adding additional needs to the list of basic psychological needs, these candidate needs (e.g., meaning, a security need, and self-esteem) do not fulfil all the six criteria of being a basic psychological need (see Ryan & Deci, 2017 for these six criteria). For example, self-esteem and meaning cannot be considered basic psychological needs since they are rather

viewed as outcomes of basic psychological needs satisfaction (Ryan & Deci, 2000b; 2017).

Additionally, with regard to the fact that the basic psychological needs are innate according to SDT (Ryan & Deci, 2017). The inborn nature of the basic psychological needs obviously contradicts the ontological assumptions of this thesis. More specifically, the ontological assumptions of the transformative paradigm entails that there exists multiple socially constructed realities, which are shaped by social, political, cultural, gender, economic, age, disability, and ethnic values (Chilisa & Kawulich, 2012; Mertens, 2007). Thus, from a transformative perspective, these needs would rather be viewed as being socially constructed and learned and valued through a socialization process (see Chilisa & Kawulich, 2012; Mertens, 2007). This contradiction is therefore acknowledged as a limitation of the thesis. Given the aim of the transformative design, however, of responding to the needs of the adolescents, herein it is believed that the merits of using SDT a theoretical framework to provide a deeper understanding of the phenomenon that has been studied outweighs the ontological contradiction.

With regard to the health promotion approach of this thesis, it is obvious that we aim to facilitate the adolescents' health behavior (i.e., physical activity) for the sake of the adolescents' health (cf. Mittelmark & Bauer, 2017; WHO, 1986). At first glance, the idea of promoting the adolescents' physical activity for their health, might seem to contradict the stipulations of SDT and the focus on intrinsic motivation (i.e., engaging in physical activity for the activity itself is satisfactory; Ryan & Deci, 2017). First, just because we as researchers desire to facilitate the adolescents' physical activity for health reasons, does not imply that we cannot design the physical activities so that the adolescents have fun or enjoy the physical activities. Second, if an adolescent engages in physical activity for health reasons, it means that the adolescent has internalized the behavior to the extent that he or she values the benefits that the behavior brings. From an SDT-perspective, this means that the adolescent regulates the behavior through identified regulation, which is considered to be an autonomous, or 'adaptive', form of motivation (Ryan & Deci, 2017).

Chapter 9: Conclusion

The results of this thesis have shown that adolescents, from a multicultural community of low SES, physical activity engagement is multifaceted, and influenced by a variety of factors at and individual level (e.g., gender and motivation), social level (e.g., family and friends), environmental level (e.g., sports grounds and school), and societal level (e.g., policies and gender norms). The majority of factors that facilitated and undermined the adolescents' physical activity were similar to those identified in previous studies. Nonetheless, the importance of spontaneous physical activity and the magnitude of screen-based activities as undermining their physical activity appears to be specific to these adolescents from a multicultural community of low SES.

In trying to facilitate the adolescents' physical activity, a two-year school-based intervention was developed and implemented by the researchers and the adolescents through collaboration and shared decision making. To the best of our knowledge, this is one of the first attempts to involve adolescents in the development and implementation of an empowerment-based school physical activity intervention in a multicultural community of low SES. In general, the researchers experienced that the adolescents were curious about the intervention activities, they had numerous suggestions for intervention activities (both realistic and unrealistic), and they appeared to appreciate practical activities (e.g., playing sports), rather than sedentary ones (e.g., critical discussions). The researchers also experienced that the adolescents seemed to value cooperating with their peers, and they took responsibility in developing and implementing intervention activities. During the course of the intervention, however, the researchers faced a number of challenges that complicated the intentions of supporting the adolescents' participation and empowerment. For instance, the researchers experienced difficulties in applying structured group health coaching to support the adolescents in working towards long-term physical activity goals. The researchers also faced several ethical dilemmas in implementing and developing the intervention, such as, the voluntariness of the intervention.

During the two-year intervention, there was a credible decrease in the adolescents' controlled motivation, autonomous motivation, and

accelerometer-measured MVPA. There was no credible intervention effects on either basic needs satisfaction, controlled motivation, autonomous motivation, or accelerometer-measured MVPA. Thus, the intervention was unsuccessful at promoting the adolescents' basic needs satisfaction, motivation, and MVPA. Even though no intervention effects were observed, the adolescents expressed several merits of participating in the intervention, such as, feeling listened to, increased knowledge and skills, and improved awareness of their own physical activity. Seeing as this intervention, like others, has not produced desired effects on the physical activity of adolescents from multicultural communities of low SES, and given the complex nature of their physical activity, we probably need multidimensional intervention approaches across contexts of higher intensity that emphasize practical activities to counteract the decline in physical activity during adolescence and to truly achieve lasting change in their physical activity.

Implications

Based on the adolescents' stories, practitioners working with adolescents (e.g., teachers and other school personnel, health pedagogies, coaches), in multicultural communities of low SES, could try to create opportunities for adolescents to engage in physical activities that they find enjoyable, by offering options and variations, opportunities to learn and develop their skills, and comradery (i.e., being supportive of the adolescents' basic psychological needs), while simultaneously trying to reduce the performance-orientation of physical activity. Practitioners, in multicultural communities of low SES, can further consider how organizational structures at schools could become more supportive of the adolescents' physical activity, for example, longer breaks with organized activities, more PE class, and organizing activities before or after school hours. Practitioners may also consider strategies for reducing adolescents', from multicultural communities of low SES, screen-time activities and/or ways of utilizing smartphones and tablets to support the adolescents' physical activity. Practitioners, in multicultural communities of low SES, can also explore the adolescents' sources of social support and encourage them to seek social support from significant others (e.g., family, friends) as a way of supporting their physical activity. Moreover, practitioners can demonstrate an awareness of the environmental factors (e.g., access) and gender norms that influence the adolescents', from multicultural communities of low SES, physical activity and support the adolescents in coping with these factors (e.g., inspire

the adolescents to challenge gender norms). Further, in order to increase adolescents' physical activity, it might be feasible to subsidize, or even eliminate, membership fees to sport clubs for adolescents in general, and for adolescents in multicultural communities of low SES in particular.

With regard to future school-based physical activity interventions, in multicultural communities of low SES, it is highly recommended that these are accompanied by various intervention strategies that target different contexts (e.g., school and leisure-time) and determinants of physical activity at different levels (i.e., individual, social, environmental, and societal). Lessons learned from the school-based physical activity intervention described herein further suggests that it is beneficial to: acquire a deep and broad understanding of the intervention context as well as the adolescents; be flexible in negotiating, adjusting, and reorganizing the intervention; recruit a school where the school personnel and the adolescents are positive at the start of the intervention; integrate the intervention into the adolescents regular curriculum to be able to reach as many adolescents as possible; cautiously consider how possible health coaching is implemented, in terms of how often and mode (i.e., one-on-one vs group), and how it suits adolescents relative lack of future orientation; and emphasize the implementation of practical activities, instead of theoretical/sedentary ones.

Future research

- It might be of interest to look descriptively on endpoint-data from school-based physical activity interventions, in multicultural communities of low SES, to identify those adolescents who actually increased their physical activity, and to conduct in-depth interviews with these adolescents to gain a deeper understanding of their experiences from participating in such interventions.
- It might be fruitful to develop, implement, and evaluate empowerment-based physical activity interventions, in multicultural communities of low SES, that includes measures at an individual level (e.g., one-on-one health coaching), social level (e.g., involving the adolescents' family), environmental level (e.g., school and neighborhood), and societal level (e.g., policies).
- The girls accumulated substantially less MVPA at baseline compared to the boys and the adolescents highlighted gender norms which entailed

that physical activity was a masculine pursuit and higher expectations were placed on girls, compared to boys, academic achievement and their engagement in household chores. Consequently, it might be of interest to develop and implement strategies that target girls only, to reduce gender differences in adolescents' physical activity in multicultural communities of low SES.

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