



School of Health, Care and Social Welfare

HOW ARE ACADEMIC PERFORMANCE AND SCHOOL SOCIAL CAPITAL RELATED TO MENTAL HEALTH?

Findings from a comprehensive community-based cross-sectional school survey among adolescents in Sweden.

ANDREAS RÖDLUND

Main Area: Public Health Science
Level: Advanced Level
Credits: 15 credits
Programme: The Master's Programme in
Public Health Science
Course Name: FHA079
Course Code: FHA079

Supervisor: Fabrizia Giannotta
Examiner: Susanna Lehtinen-Jacks

Seminar date: 2021-06-03
Grade date: 2021-06-22

ABSTRACT

Mental health problems are an important public health issue. However, in population studies, surveillance of the protective aspects of mental health has been somewhat overlooked in the public health community. Given this, the present thesis aimed to investigate whether academic performance, school social capital, and positive mental health are associated in a cross-sectional sample of 3880 adolescents from ninth grade in compulsory school (50.6%) and second grade in upper secondary school (49.4%). In total, the sample consisted of 51% females and 49% males. Using the well-validated instrument MCH-SF for well-being, the result revealed an association between academic performance ($\beta = -.09$, $p < .001$), indicating that better academic performance was associated with higher levels of mental health. Further, all measured dimensions of school social capital revealed an association with mental health. The strongest association were found between the dimension of teacher support and mental health ($\beta = .26$, $p < .001$). Next, the result showed a significant interaction effect from one dimension of school social capital, namely teacher support ($\beta = -.03$, $p < .05$). Notably, more research in school social capital and determinants of teachers' work environment is valuable, as social capital formed by the relationship between teachers and students seemed highly important for adolescents' academic performance and mental health.

Keywords: *Academic Performance, Adolescents, Positive Mental Health, School Social Capital, Well-being*

CONTENTS

1	INTRODUCTION	1
2	BACKGROUND.....	2
2.1	Positive Mental Health	2
2.2	Academic Performance	2
2.3	School Social Capital.....	3
2.4	School Social Capital, Academic Performance, and Mental Health	4
2.5	Problem Formulation	5
3	AIM.....	6
4	METHOD.....	6
4.1	Data Collection and Population.....	6
4.2	Material	7
4.2.1	Academic Performance.....	8
4.2.2	School Social Capital	9
4.2.3	Positive Mental Health	10
4.3	Statistical Analyses.....	10
4.4	Ethics	11
5	RESULT.....	12
5.1	Academic Performance, School Social Capital and Mental Health	13
5.2	The Moderating Role of School Social Capital.....	14
6	DISCUSSION.....	17
6.1	Method discussion	17
6.2	Ethics discussion	19
6.3	Result discussion.....	20
6.4	Future research and Implications	21
6.5	Conclusion	22
	REFERENCES	23

APPENDIX A: SELECTED QUESTIONS FROM SALVE 2020

1 INTRODUCTION

Mental health problems are an important issue in many Western countries. During the 21st century, an increasing trend of mental health problems has been seen among adolescents (Kielsing et al., 2011). One in five children experiences mental problems worldwide (Bor et al., 2014). The World Health Organization (2013) has estimated that suicide is the second most common cause of death among young people. Moreover, people experiencing mental illness have a higher risk of disability and mortality (WHO, 2013). Although still debated, there are many proposed explanations for the growing trend, e.g., family conditions, digital development, school pressure, to cite a few (Bor et al., 2014). However, research to monitoring trends in the population commonly focuses on risk factors of diseases rather than examining aspects that can facilitate health outcomes (VanderWeele, 2020). Beyond the risk factors, it is also essential to consider the protective elements of mental health, as stressed in the WHO's (2004) definition of mental health, where the absence of mental illness is not equal to being mentally healthy. Further, studies from the US show that less than half the population without mental illness is not mentally healthy considering emotional, psychological, and social well-being (Keyes, 2007). Therefore, in addition to symptomatology, it is also essential to examine well-being to understand mental health.

Many studies have examined how school-related determinants affecting mental health. Studying these factors is highly relevant as academic performance and school social capital are two determinants related to many health outcomes (Dufur et al., 2008). Nevertheless, relatively few studies have examined how they are related to mental well-being. Although increased mental health has been associated with better grades among adolescents (Keyes et al., 2012), more research is needed to understand if other aspects can influence the relationship between academic performance and well-being (O'Connor et al., 2019). For instance, academic performance is also highly related to social capital (Fink, 2014). Studies of school social capital have most commonly examined behavioural aspects (e.g., grades or substance use). Less is known about the influence on non-behavioural aspects, such as well-being (Dufur et al., 2019). In particular, the existing studies have often examined school social capital with mental health problems (e.g., Colaroosi & Eccles, 2003). In contrast, few studies have looked into the association with mental well-being. Therefore, knowledge about elements influencing mental health in school can be beneficial when promoting mental health among adolescents.

Investigating mental health is relevant for public health, and the school environment is a beneficial arena to promote mental health among adolescents. Therefore, this thesis examines whether school-related factors (i.e., academic performance and school social capital) were associated with mental health among adolescents in a community-based sample of adolescents in the ninth grade in compulsory school and second grade in upper secondary school. It also investigates whether some aspects of the school social capital, namely teacher support and parental school monitoring, have a moderating role in the association between academic achievement and mental health.

2 BACKGROUND

2.1 Positive Mental Health

Positive mental health focuses on well-being rather than disorders and is increasingly used as a concept. Positive mental health and mental illness are not two sides of the same coin, as the same factors that determine well-being do not determine illness (Huppert, 2009; Keyes et al., 2012). Positive mental health is defined as subjective well-being, which is described by a multidimensional construction via emotional (*hedonic*), social and psychological (*eudaimonic*) well-being (Keyes, 2005). In other words, the interaction between feeling satisfied with life (*emotional well-being*), considering life as meaningful (*psychological well-being*), and feeling meaning in social life and the larger society (*social well-being*) determines whether the individual experiences well-being (Keyes, 2005; Huppert, 2009). However, the interest in positive determinants for mental health has increased across the 21st century, as the contribution of positive mental health has previously been somewhat overlooked by the public health community (Seligman et al., 2009; Trudel-Fitzgerald et al., 2019). In contrast to risk factors, determinants of well-being can contribute with other insights to promote good mental health by providing an increased understanding of mental health (O'Connor et al., 2019; VanderWeele et al., 2020). Accordingly, examining multidimensional well-being, including emotional, social, psychological well-being, can complement the screening for mental illness in adolescents.

2.2 Academic Performance

Academic performance is related to adolescent's mental health. Many studies have shown associations between academic performance and good mental health among adolescents (Keogh et al., 2004; Putwain, 2009a; Putwain et al., 2009b). Historically, research on academic achievement has focused on adolescents' grades, while research about school attendance mainly has focused on behavioural issues (Lawrence et al., 2019). However, both aspects contribute to adolescent's academic performance (i.e., academic success and failure) (De Socio et al., 2004; Morrissey et al., 2014; Lawrence et al., 2019). Therefore, the present thesis captures academic performance by summarizing these aspects. Furthermore, it is justified to examine these aspects combined since regular attendance in school is considered a prerequisite for performing in school and achieving academic success (Lawrence et al., 2019). Likewise, school grades are a prerequisite for academic success (De Socio et al., 2004; Keyes et al., 2012; Deighton et al., 2017; Lawrence et al., 2019). Besides, school attendance is identified as an early sign of academic failure and attendance is associated with increased well-being (De Socio et al., 2004). Moreover, school grades can predict internalizing symptoms, which indicates that reduced school achievement leads to mental health problems (De Socio et al., 2004; Deighton et al., 2017). On the contrary, better grades were associated with more well-being (Keyes et al., 2012). In short, both grades and attendance are indicators for academic performance and mental health.

Social factors may potentially influence the association between academic performance and mental health. Although the relation between academic performance and mental health is established (e.g., Keogh et al., 2004; De Socio et al., 2004; Deighton et al., 2017), O'Connor et al. (2019) argue that the association can be a consequence of various social factors rather than the fact that academic performance modifies adolescents' levels of well-being. Nevertheless, it may be true that adolescents feel bad about academic failure. However, a range of underlying social factors, such as family conditions and teacher support, can potentially influence if adolescents reach academic success and experience well-being (O'Connor et al., 2019). Indeed, research is needed in representative populations to investigate whether social factors can modify the relation between mental health and academic performance (Goldfeld et al., 2016; O'Connor et al., 2019). Thus, considering school social capital simultaneously with the association of academic performance and well-being can increase the understanding of the association.

2.3 School Social Capital

Social capital can be protective against many adverse health outcomes. Previous studies underscore that social capital is a social determinant of health (Gilbert et al., 2013). Social capital refers to individuals' social relationships and the resources used from these relationships (Coleman, 1988). Like financial capital, social capital operates to facilitate outcomes, although social capital refers to social consequences (Dufur et al., 2019). Social capital includes three types of capital: bonding, bridging, and linking social capital (Rostila, 2010). Bonding includes social relations where interaction is mutual, such as in the family or with close friends, whereas bridging social capital refers to relations where interaction is less common, e.g., in organizations (Johnson et al., 2017). Linking social capital includes the interaction across the governmental gradient (Rostila, 2010). Thus, social capital includes interactions with individuals and institutional actors (Dufur et al., 2019). Therefore, social capital can be applied in several contexts, and this thesis examines social capital in the school environment. In addition, social capital can be divided into two components, i.e., structural and cognitive components (Coleman, 1988). The structural component includes participation in social networks or other community involvement, while the cognitive component refers more to perceptions, e.g., trust, norms, and values (Johnson et al., 2017). This thesis investigates the cognitive component in the school social capital.

School social capital is a positive factor for academic achievement and well-being and a well-used framework in social science. The present thesis uses school social capital as a framework. In Coleman's (1988) definition of the framework, school social capital can improve well-being and enhance educational performance. When adolescents have social relationships in school with different densities, such as with peers, teachers, and school staff, these relationships can support the learning environment and the social environment. Indeed, these relationships are considered an asset (Coleman, 1988). Thus, these relationships lead to increased school social capital. Besides, Coleman (1988) also mentions family monitoring as an essential aspect in school social capital, such as parents' expectations and engagement influences educational performance. Therefore, the school social capital

framework includes internal and external cognitive ties. For example, peer support and teacher support are examples of internal relations found in the immediate school environment, whereas parents' school monitoring is an external tie (Tsang, 2010). Therefore, the school social capital framework is conceptualized as a multi-level combination of social relationships, i.e., between students, teachers, and parents.

It is relevant to examine the impact of school social capital on mental health. According to Dufur et al. (2019), in comparison to behavioural outcomes, such as alcohol use and delinquent behaviour, it is less clear how school social capital is related to non-behavioural outcomes. In particular, the relation to positive mental health is less clear. Studies have shown that school social capital, especially the family dimension seems to protect mental health. In contrast, other dimensions' influence on mental health is somewhat unclear (Dufur et al., 2019). Thereby, the understanding of mental health can increase by examining the dimensions of school social capital.

The dimensions of school social capital can capture different aspects of the health outcome. Dufur et al. (2013) argue that school social capital is a complex concept and framework, therefore recommends looking at several dimensions of the concept when examining school social capital instead of investigating school social capital in an overall level, as the evidence becomes somewhat limited by not considering more than one dimension of the concept. Coleman (1988) claims that school social capital obtains on student-, classroom-, and school-level. For instance, in a supportive environment, school social capital can be developed and encouraging social relations can improve well-being among adolescents (Tsang, 2010). However, a supportive environment is a very general term. Therefore, to understand how adolescents can develop school social capital, it is rational to examine the different dimensions of school social capital, as each dimension can contribute differently to mental health (Dufur et al., 2019). Thereby, both student-, classroom-, and school-level dimensions were examined in the present thesis.

2.4 School Social Capital, Academic Performance, and Mental Health

School social capital influences both academic achievement and well-being. The foundation for this statement is Astin's (1997) model, where adolescents' inputs and health outcomes are affected by environmental factors. Thus, an association between input and health outcome can depend on an environmental factor and differentiate within the presence of an environmental factor, for example, changing in the direction or strength (Astin, 1997; Brambor et al., 2006). Astin's model supports that a social factor, such as the dimensions of school social capital, may influence the input (i.e., academic performance) and health outcome (i.e., mental health). Therefore, Astin's model also supports the framework of school social capital and underscores the rationale to examine whether school social capital may have a protective role in the association between academic performance and mental health. Besides, prior research underscores the use of Astin's (1997) model, such as higher levels of school social capital have already been associated with both better academic performance and increased well-being (Fink, 2014; Wentzel et al., 2016; Baik et al., 2019). In sum, the

presence of school social capital may potentially mitigate the consequences of academic failure on mental health.

Existing literature underscores the influence of school social capital across academic performance and well-being. In previous studies, Fink (2014) has used Astin's model in US college students. A supportive school environment showed a solid foundation for well-being, whereas academic performance was less crucial for comparison. In addition, academic performance was closely related to environmental factors, such as supportive environment and social interactions improved academic performance (Fink, 2014). Another insight from Fink's (2014) study also showed that when levels of social capital are high, well-being among adolescents increases, likewise academic performance increase. There is, however, an existing foundation for the fact that school social capital can improve academic performance. Previous studies (e.g., Wentzel et al., 2016; Baik et al., 2019) have shown that dimensions such as parental school monitoring and teacher support are strongly associated with increased academic performance. Thus, school social capital can act protective for well-being in terms of academic failure.

In general, relatively few studies have examined school social capital with the concept of positive mental health. Conventionally, school social capital has often been evaluated with mental disorders, e.g., depression or school burnout (Colarossi & Eccles, 2003; Lindfors et al., 2017), while less is known about positive mental health and school social capital (Dufur et al., 2019). On the other hand, some studies have looked into the association of well-being and social capital in the school environment. For example, Eriksson (2012) and colleagues investigated the role of social capital on health outcomes among Swedish children. Their results indicated that higher levels of social capital were associated with higher levels of well-being, although not considered psychological and social well-being (Eriksson et al., 2012), which is included in the positive mental health concept (Keyes et al., 2012). In addition, Fink (2014) has investigated positive mental health among US college students. In particular, a supportive school environment was a significant predictor of positive mental health (Fink, 2014). Despite the vital accomplishments, additional questions remain, such as how student-, class-, and school-level of school social capital influence student's mental health. Therefore, the present thesis examines whether school social capital has a protective role in the association between academic performance and mental health.

2.5 Problem Formulation

Few studies have examined several dimensions of school social capital simultaneously with academic performance and positive mental health, particularly with validated instruments for positive mental health. In particular, more knowledge is needed on how school social capital influences well-being among adolescents, such as which dimensions of school social capital impact adolescents' well-being. Besides, the present thesis examines the protective aspects of mental health, which can complement studies of risk factors. Besides, examining other aspects than symptoms correspond to WHO's (2004) definition of mental health, where mental health is considered more than the absence of mental illness. Therefore,

knowledge about positive aspects can increase the understanding of mental health. However, more information about the protective aspects is needed to establish why it is essential to promote these characteristics.

There are also arguments for examining the moderating role of school social capital in the association between academic achievement and well-being and shed light on the potential protective role of school social capital in the association between academic performance and mental health. Previous studies have already shown that school social capital can act protectively against academic failure (Fink, 2014). In particular, school social capital dimensions such as teacher support and parental seemed protective for mental health in terms of academic failure (Wu et al., 2010; Fink, 2014; Wentzel et al., 2016; Baik et al., 2018; Dufur et al., 2019). Thus, potentially, school social capital can maintain well-being when adolescents experience academic failure.

3 AIM

This thesis aimed to examine whether an association exists between school social capital, academic performance, and positive mental health conceptualized by emotional, social, and psychological well-being. In particular, the objectives were:

- a) To examine whether academic performance and school social capital are associated with positive mental health.
- b) To examine which dimensions of the school social capital dimensions are associated with positive mental health and if any dimension is more strongly associated with positive mental health.
- c) Investigate the moderating role of two dimensions of school social capital, namely teacher support and parental school monitoring, in the association between academic performance and positive mental health.

4 METHOD

4.1 Data Collection and Population

This study uses data from the comprehensive cross-sectional study of Survey of Adolescents Life in Vestmanland 2020 (SALVe). SALVe is a school-based community survey conducted by the county council in Vestmanland. Its primary purpose is to monitor the health of adolescents living in the county, including private and municipal schools (Region Västmanland, 2020; Söderqvist & Larm, 2021). Vestmanland is a mid-size county located approximately an hour from Stockholm with public transportation. In terms of health, according to SCB's (2021) database, the socioeconomic conditions and prevalence of public

health diseases do not stand out in any direction compared to other counties in Sweden (SCB, 2021). In addition, prior studies have considered Vestmanland county as quite representative of Sweden (Åslund & Nilsson, 2013; Söderqvist & Larm, 2021). The survey was carried out in early spring 2020. The survey content captured adolescents' living conditions, lifestyle, and health (Söderqvist & Larm, 2021). According to Söderqvist & Larm, 2021, 5480 adolescents from the county were invited to participate (Söderqvist & Larm, 2021). The sample included adolescents from the ninth grade in compulsory school (50.6 %) and the second grade in upper secondary school (49.4 %). The mean age was 16.23 years in the range from 14 years to 18 years. In addition, the participants answered the survey digitally during school hours in a classroom environment (Söderqvist & Larm, 2021). The present thesis used a selection of questions from SALVe 2020 (Appendix A).

4.2 Material

In addition to the external loss from the originating data, the present thesis also contained internal loss. The total target population included 5480 adolescents, all of whom were invited to participate. In total, 3880 adolescents completed the questionnaire and were included in the study. Accordingly, there was an external loss of 1600 participants, which corresponded to an approximately response rate of 71 %. However, there was an internal loss of 753 participants because participants did not complete the whole questionnaire for different reasons. Thereby, the analysis included 3127 participants. Figure 1 shows the flow chart of the study population, including studied population, external and internal loss.

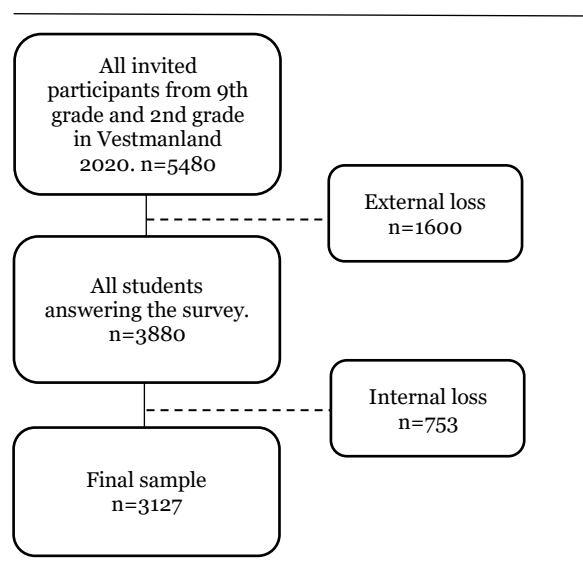


Figure 1: Flow chart of studied population.

Beyond academic performance and school social capital variables, the material included several potential confounding variables for mental health (see Appendix A). Gender (n=3880) and subjective socioeconomic status (n=3817) were used as background variables. Subjective socioeconomic status (SES) was captured by a single item about the participants' perceptions of their family's economy. SES was measured on a 7-point scale (1=low, 7=high), the variable was split on the median ($Mdn=5$), and participants were classified in low/medium SES and high SES. In addition to demographic and sociodemographic covariates, two lifestyle items were used as background variables. Participants were asked about their physical activity; "how often do you exercise?" (PA1, n=3398) and "how much do you move on average each day? (e.g., walking, cycling, or sports)" (PA2, n=3319).

4.2.1 Academic Performance

Following (e.g., DeSocio et al., 2004; Morrissey et al., 2014; Lawrence et al., 2019), school grades and school attendance were selected to capture the adolescents' academic performance. Two items were used. The first item included adolescents' school grades. Next, participants were asked, "Do you have the grade F in any subjects/courses" (i.e., F = failed the course). The response options were (0) no, (1) yes, in 1-2 subjects/courses, (2) yes, in 3-4 subjects/courses, or (3) yes, in 5 or more courses.

The second item considered adolescents' school attendance, and the question was, "do you often skip classes?". The response options were as follows; (0) no, (1) yes, once each semester, (2) yes, once a month, (3) 2-3 times each month, (4) yes, every week, and (5) yes, several times each week. This item was recoded into four categories to match the grade variable, where 0=no, 1=extremely rarely, 2=on monthly basis, 3=on weekly basis.

School grades and school attendance were summarized into a variable representing academic performance. The inter-item correlation was ($r(3614) = .33, p < .001$), which is acceptable according to Robinson and colleagues (1991) guidelines for inter-item correlation. Noteworthy, when the scale was summarized, low scores indicated academic success (0=academic success, i.e., no failed course and do not skip any lessons). In contrast, high scores indicated academic failure (6=academic failure, i.e., failed in multiple courses and regularly skipped lessons). Thus, lower values indicate better academic success, and increasing values indicate academic failure. Table 1 shows the coding of the academic performance variable. The summarized variable showed a relatively high skewness (1.6) and kurtosis (2.1) values. However, Streiner et al. (2015) claim that skewness of ± 2 and kurtosis of ± 3 are acceptable to perform linear regression.

Table 1: Coding of the academic performance variable.

Grades		Attendance						
Do you have a grade of F in any subjects/courses?		Do you often skip classes?						
5 or more subjects	3	On weekly basis	3					
In 3-4 subjects	2	On monthly basis	2					
In 1-2 subjects	1	Extremely rarely	1					
No	0	No	0					
Summarized Variable								
Academic Success	0	1	2	3	4	5	6	Academic Failure

4.2.2 School Social Capital

A battery of 19 questions was applied to capture the dimensions of school social capital (Appendix A). A factor analysis was performed to find latent factors within the school-related items. The Kaiser criterion was used, and oblique rotation was chosen (Field, 2018). Three latent factors were found. Factor 1 had an eigenvalue of 2.92 and included items related to students' relationships and perceptions of their teachers. This factor was defined as teacher support, and it represents a mutual relationship between students and teachers that contains both expectations and appreciation. Factor 2 had an eigenvalue of 1.59, and the items included students' perceptions of the health team at their schools. Factor 3 (Eigenvalue= 1.30) included items of their parent's engagement and expectations of students' schoolwork, and this dimension was defined as parental school monitoring. A single item did not load into any factor, which was an item including friends at school. Previous research (e.g., Coleman, 1988) underscores the importance of peer support in school. Therefore, a single item represented peer support. Further, the dimensions of school social capital were as follow:

Peer support. The First dimension (n=3847) was, as mentioned, captured by a single item. Participants were asked whether they have friends to hang out with within school. This item was measured on a likert-scale from 0= does not match at all to 4= matches exactly. The variable was coded binary as follows; 0= does not match to match to a certain extent, 1= matches well to matches exactly.

Teacher support. Five items were applied to describe this dimension (n=3426). The summarized dimensions showed good internal reliability and showed alpha ($\alpha = .82$) above .80. The participants were asked how much they agree with the following statements: "I get to know regularly how it goes for me in schoolwork", "my teachers expect me to achieve the goal in all subjects", "I feel that I get noticed by the teachers when I do something good", "I feel that my teachers listen to my opinion" and "I feel that I get the help I need in schoolwork". All items were measured on a likert-scale from 0=does not match at all, to 4=matches exactly. The teacher support dimension was summarized with scores from 0-20 and revealed normal distribution (skewness=-0.5, kurtosis=0.5).

Student health-team. This dimension includes the perceptions of how helpful the student health team is in their schools (n=3363). Participants were asked two questions, "I can receive help from the health team if needed", and "If the student health team cannot help me, they refer my parents and me further". The response options were (0) have no idea, (1) does not match at all, (2) match to some extent, (3) matches exactly. These two questions were summarized ($r(3363) = .65, p = <.001$), with a score of 0-6 and showed normality (skewness=-0.6, kurtosis=-1.0).

Parental school monitoring. Three items captured parental school monitoring (n=3880). Participants were asked how important it is "that you handle the schoolwork", "that you do not shirk", and "when you go to bed" in their home. All items were measured on a likert-scale from 0=not so carefully to 3=very carefully. These items were summarized with scores from 0-9 and revealed normal distribution (skewness=-0.8, kurtosis=1.0). The inter-item correlation between these items was .33, thus acceptable (Robinson et al., 1991).

4.2.3 Positive Mental Health

Mental Health Continuum – Short Form (MHC-SF) was used to capture positive mental health ($n=3669$). MHC-SF is a validated screening tool for well-being at the population level (Keyes, 2009). MHC-SF contains fourteen items (see Appendix A) where participants were asked; "During the past month, how often did you feel...", e.g., ("interested in life", "that you liked most of your personality", "confident to think or express your own ideas and opinions"). Each item is measured on a six-point scale with the following response options; (a) never, (b) once or twice, (c) about once a week, (d) 2 or 3 times a week, (e) almost every day, and (f) every day. Consequently, item 1-3 contains emotional (*hedonic*) well-being, item 4-8 contains social (*eudaimonic*) well-being, and items 9-14 psychological (*eudaimonic*) well-being. The scale was summarized in a range from 0-70 with $M=42.6 \pm SD=14.7$ ($\alpha=.90$). MHC-SF did not reveal a violation of the assumption for normality (skewness=-0.4, kurtosis=-0.2).

4.3 Statistical Analyses

Descriptive statistics were used to describe the sample's characteristics. This was done using frequencies, percentages, range, means and standard deviations for the study variables. In addition, Mahalanobis distance, Leverage values and Cook's distance were used to screen for outliers (Field, 2018). Accordingly, the procedure was applied to detect unserious participants. For instance, participants responded with the same response options across the questionnaire. However, no participants were considered unserious when each outlier was analyzed in-depth, and it was not possible to conclude that their answers were false. Therefore, no participants were excluded from the screening.

A two-step hierarchical linear regression was performed to examine the association between academic performance, school social capital dimensions, and mental health. Scatterplots were used to assess linearity and additivity. The normality of residuals was considered using a p-p plot with standardized residuals and standardized predicted values (Halunga et al., 2017). The independence of errors was controlled by Durbin-Watson (Field, 2018). Multicollinearity was controlled with a correlation matrix (Mansfield & Helms, 1982). Given the guidelines from Field (2018), correlation above .70 was considered a concern for multicollinearity. Step one of the analysis included academic performance along with covariates. Next, all dimensions of school social capital were entered simultaneously. Thus, the first and second research questions can be answered by using this procedure.

Baron & Kenny's (1986) model for moderation was used to answer the third research question. Before introducing the moderation effect, the relationship between the dependent variable, the independent variable, and the potential moderator variable needs to be determined. Next, the interaction term can be entered (Baron & Kenny, 1986). A hierarchical linear regression evaluated the moderation. Step one of the analysis included the independent and moderator variables, while the interaction term was entered in the second step. The interaction effect was created by centring the independent variables ($M=0$, $SD=1$), and the z-score was multiplied to overcome multicollinearity problems (Brambor et al.,

2006). A third step was added where covariates were included to adjust for potential confounding factors. Figure 2 illustrates the moderation.

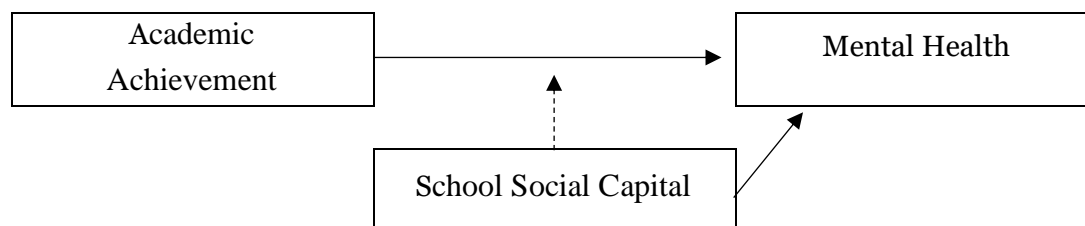


Figure 2: Moderation Model

To better understand the impact of the potential interaction was follow-up procedures implemented as recommended by Aiken et al. (1991). A Johnson-Neyman test was performed to identify significant interaction regions, consequently, assess in which spectrum the interaction is significant (Miller et al., 2013). However, the Johnson-Neyman test did not show standardized b-coefficients. Therefore, unstandardized b-coefficients are presented.

Further, the interaction effect was described with simple slopes. The interaction was interpreted with graphs showing the levels of mental health at the Y-axis and academic performance at the X-axis. The slopes showed participants' levels of mental health and academic performance at reported scores of - 2 SD, - 1 SD, M, and + 1SD in teacher support. Noteworthy, academic performance was interpreted by academic success (- 1 SD) and failure (+ 1 SD) at the X-axis. Thus, reported scores of 0 in academic performance were classified as academic success, and scores of 2.2 showed academic failure.

Furthermore, post hoc power analyses were performed to estimate observed power to reject a false null hypothesis. Power of at least 0.8 was required to reject a false null hypothesis (Cohen, 2013). The power ($1 - \beta$ err probability) was calculated by effect size ($f^2 = R^2 / 1 - R^2$), α error (α) (i.e., significance level), degrees of freedom for the denominator (v) (i.e., calculated by sample size - 1 - the number of predictors), degrees of freedom for the numerator (u) (i.e., the number of predictor variables) (Faul et al., 2007). In this thesis, the significance level was $p = < .05$. SPSS version 26 was used to perform regression analyses, and the statistical software R Studio 3.4 was used to measure effect size and power.

4.4 Ethics

In SALVe 2020, several commitments were applied to maintain research ethics. Söderqvist & Larm (2021) mention that all participants watched a video before completing the survey, the video included information about the study, such as the objectives for SALVe, and that participation was voluntary and can be interrupted at any time without any specific reason. Consequently, participants gave consent by completing the questionnaire. Besides, participation was anonymous. Region Vestmanland did not collect names or id-number.

SALVe has acquired ethical approval from the ethics review authority. The department of public health at Region Vestmanland has given consent to use SALVe 2020. The author has also signed a contract with restrictions for using SALVe. The author received the data from a secure cloud link and consequently saved the data set on a computer with a password.

5 RESULT

The sample consisted of a balanced distribution of females (51 %) and males (49%). In academic performance, adolescents generally reported high levels of academic performance ($M=0.9$, $SD=1.3$) (Table 2). For the school social capital dimensions, the mean and SD were ($M=13.6$, $SD=3.7$) in teacher support, ($M=3.8$, $SD=2.2$) in student health-team, and ($M=6.0$, $SD=1.7$) in parental school monitoring. Of the total sample, 67 % had peers to hang out with in school, while 33 % responded that they had no friends in school or have friends to some extent in school. Moreover, the positive mental health variable showed a mean and standard deviation of ($M=42.6$, $SD=14.6$).

Table 2 Mean, standard deviations, range and bivariate correlations for continuous and ordinal study variables.

Parameters	M (SD)	Range	1	2	3	4	5	6	7
Predictors									
1. AP	0.9 (1.3)	0-6	1						
2. TS	13.6 (3.7)	0-20	-.21	1					
3. HT	3.8 (2.2)	0-6	n.s.	.30	1				
4. PM	6.0 (1.7)	0-9	-.26	.14	.05	1			
Covariates									
5. PA 1	2.2 (0.7)	1-3	-.06	.08	.06	.09	1		
6. PA 2	3.2 (1.3)	0-5	-.20	.09	.05	.13	.47	1	
Dependent									
7. MCH-SF	42.6 (14.6)	0-70	-.24	.38	.18	.23	.21	.24	1

Next, to control multicollinearity, bivariate correlations were examined among the studied variables. The analysis revealed significant bivariate correlations between almost all independent variables and covariates, except between the student health team and academic achievement and between the student health team and subjective socioeconomic status. The highest correlation was found between the dimensions of physical activity ($r(3387) = .47$, $p < .001$). Further, the analysis revealed correlations in a range from $r = -.26$ to $r = .30$. Because of this, there was low concern about multicollinearity. Notably, all covariates were significantly associated with mental health, which underscores the importance of adjusting

for these characteristics. Table 2 presented the descriptive statistic and the bivariate correlations between studied variables.

5.1 Academic Performance, School Social Capital and Mental Health

A two-step hierarchical linear regression was performed to investigate whether there was an association between academic performance, the school social capital dimensions, and mental health. The analysis included covariates, academic performance, and the school social capital dimensions. The multicollinearity diagnosis showed no collinearity problems, the variance of influencing factor was in the range of 1.04 – 1.35, nor were there any concerns regarding the independence of error (Durbin-Watson= 1.8).

Step 1 of the analysis explained approximately 14 % of the variance in mental health ($F(5, 3121) = 109.53, p = <.001, R^2 = 0.14$). There was a significant negative association between academic performance and mental health ($\beta = -.18, p = <.001$) after controlling for confounding factors, such as gender, PA 1, PA 2, and SES. Thus, the result indicating that higher levels of academic performance were associated with higher levels of mental health, i.e., better academic performance indicates better mental health (Table 3).

When the school social capital dimensions were entered simultaneously in the second stage, the model showed an improvement and explained about 31 % of the variance in the mental health variable ($F(9, 3117) = 157.24, p = <.001, R^2 = 0.31$).

In the second step of the analysis, academic performance was still associated with mental health ($\beta = -.09, p = <.001$) after adjustments for covariates. For the dimensions of school social capital, all dimensions showed significant associations to mental health; peer support ($\beta = .21, p = <.001$), teacher support ($\beta = .26, p = <.001$), parental school monitoring ($\beta = .12, p = <.001$), and student health-team ($\beta = .06, p = <.001$). The result indicates that higher levels of school social capital are associated with higher levels of mental health. In short, gender ($\beta = .07, p = <.001$), PA 1 ($\beta = .07, p = <.001$), PA 2 ($\beta = .10, p = <.001$), and SES ($\beta = .11, p = <.001$) also showed significant associations to mental health in the second step. Furthermore, the follow-up post-hoc power analysis revealed observed power of 1 in step 2 ($u = 9, v = 3117, f^2 = .44, \alpha = .001, 1 - \beta = 1$).

Results from analyses of academic performance and the school social capital dimensions on mental health are presented in Table 3, regression coefficients for all predictors are reported, and standard errors in parentheses.

Table 3. Hierarchical linear regression of covariates, academic performance, school social capital dimensions and positive mental health ($n=3127$).

Parameters	Step 1		Step 2	
	$B (SE)$	β	$B (SE)$	β
Academic performance	-2.09*** (.19)	-.18	-1.02*** (.17)	-.09
School social capital dimensions				
^a Peers support			7.22*** (.51)	.21
Teacher support			1.02*** (.06)	.26
Student health-team			.39*** (.09)	.06
Parental school monitoring			1.05*** (.13)	.12
Covariates				
^a Gender	3.08*** (.46)	.11	2.10*** (.42)	.07
PA 1	2.10*** (.38)	.10	1.42*** (.34)	.07
PA 2	1.57*** (.21)	.13	1.17*** (.19)	.10
^a SES	4.72*** (.49)	.16	3.39*** (.44)	.11
R²		.14		.31

Note: $p = * < .05$, $** < .01$, $*** < .001$, ^a=binary variable. Abbreviations: B =unstandardized regression coefficient, $S. E$ = Standard Error, β = Standardized regression coefficient. PA 1= Physical activity exercise, PA 2= Physical activity leisure time, SES= Subjective socioeconomic status. Noteworthy, academic performance is measured 0=academic success, 6=academic failure, while the school social support variables are measured lower values= lower support, and higher values=higher support.

5.2 The Moderating Role of School Social Capital

In the final analyses, the moderating role of school social capital was examined. Thus, examine whether the presence of two dimensions of school social support, namely teacher support and parental school monitoring, moderated the association between academic performance and mental health. The moderating role of teacher support was examined using hierarchical linear regression in three steps (Table 4). Further, no multicollinearity problem was detected. The variance of influencing factor was close to one in a range of 1.03 – 1.34, nor were there any concerns regarding the independence of error (Durbin-Watson = 1.8). Academic performance and teacher support were entered in the first step. The first step explained approximately 18 per cent of the variance in the mental health variable ($F(2, 3194) = 353.248$, $p < .001$, $R^2 = .18$). For academic performance, similar to the previous analysis, a significant negative association to mental health was found in the first step of the analysis ($\beta = -.16$, $p < .001$). On the other hand, in teacher support, the first step revealed a significant positive association to mental health ($\beta = .36$, $p < .001$).

When entering the interaction term in the second step of the analysis, the analysis still explained approximately 18 per cent ($F(3, 3193) = 239.546$, $p < .001$, $R^2 = .18$), thus the

interaction term of teacher support and academic performance contributed with a small R^2 -change (.003), although significant ($\beta = -.05$, $p = <.001$). Next, the model was improved by entering covariates in the third step and explained approximately 24 per cent of the variance ($F(7, 3189) = 149.928$, $p = <.001$, $R^2 = .24$).

All predictors showed significant associations after adjustment for covariates. The academic performance showed a negative association to mental health ($\beta = -.13$, $p = <.001$), the interaction term was also negatively associated with mental health ($\beta = -.03$, $p = <.05$), while teacher support revealed a positive association to mental health ($\beta = .33$, $p = <.001$). In addition, the final analysis revealed power of 1 ($u = 7$, $v = 3189$, $f^2 = .31$, $\alpha = .001$, $1 - \beta = 1$). Thus, the analysis reached observed power to reject the false null hypothesis.

Results from analyses of covariates, academic performance, teacher support, the interaction between academic performance and teacher support on mental health are presented in Table 4, regression coefficients for all predictors are reported.

Table 4: Hierarchical linear regression of covariates, academic performance, teacher support, interaction between academic performance and teacher support, and positive mental health ($n = 3197$).

<i>Parameters</i>	<i>Step 1</i>		<i>Step 2</i>		<i>Step 3</i>	
	<i>B</i>	β	<i>B</i>	β	<i>B</i>	β
Academic Performance	-1.81***	-.16	-1.49***	-.17	-1.49***	-.13
Teacher Support	1.41***	.36	1.43***	.36	1.29***	.33
Academic x Teachers			-.66***	-.05	-.45*	-.03
Covariates						
^a Gender					1.70***	.06
PA 1					1.41***	.12
PA 2					1.98***	.09
^a SES					3.89***	.13
$R^2 =$.18		.18		.24

Note: $p = * <.05$, $** <.01$, $*** <.001$, ^a=binary variable. Abbreviations: *B*=unstandardized regression coefficient, β = Standardized regression coefficient. PA 1= Physical activity exercise, PA 2= Physical activity leisure time, SES= Subjective socioeconomic status. Noteworthy, academic performance is measured 0=academic success, 6=academic failure, while the school social support variables are measured lower values= lower support, and higher values=higher support.

Besides, to better understand the significant moderation effect. Follow-up procedures were implemented as recommended by Aiken et al. (1991). Furthermore, by using the Johnson-Neyman technique, significant regions of the moderation effect were defined. The moderation effect was significant in the range of 4.82 ($b = -.66$, $p = <.05$) to 20 ($b = -2.06$, $p = <.001$) in reported scores of teacher support.

Further, to describe the main effects of the interaction, simple slopes were used to visually show how the association between academic performance and mental health changes by the

varying levels of teacher support. The graph (Figure 3) presented slopes of the interaction at - 2 SD ($b=-.79, p<.001$), - 1 SD ($b=-1.15, p<.001$), at mean ($b=-1.49, p<.001$), and at + 1 SD ($b=-1.79, p<.001$) in reported scores in teacher support. The slopes visually show the levels of mental health (y-axis) when participants experience academic success at - 1 SD (i.e., scores=0 in academic performance) and academic failure at + 1 SD (i.e., scores of 2.2 in academic performance). The graph in figure 3 visually shows how teacher support acts protective through the association of academic performance and mental health and mitigate the effect of academic failure. As can be seen, the levels of mental health are higher when higher levels of teacher support are reported both with regard to academic success and academic failure. Thus, the effect of academic failure on mental health was buffered when having support from teachers.

At - 2 SD in teacher support, the result showed that the levels of mental health were reduced with approximately 19 units when experiences academic failure compared to experience academic success. At - 1 SD in teacher support, mental health was decreased by approximately five units when adolescents experience academic failure compared to academic success. There was a change of approximately two units in mental health at mean when experienced academic failure. In brief, the result indicated that teacher support might buffer the effect of academic failure on mental health. Accordingly, the effect of academic failure on mental health was mitigated for each standard deviation increase in teacher support (Figure 3).

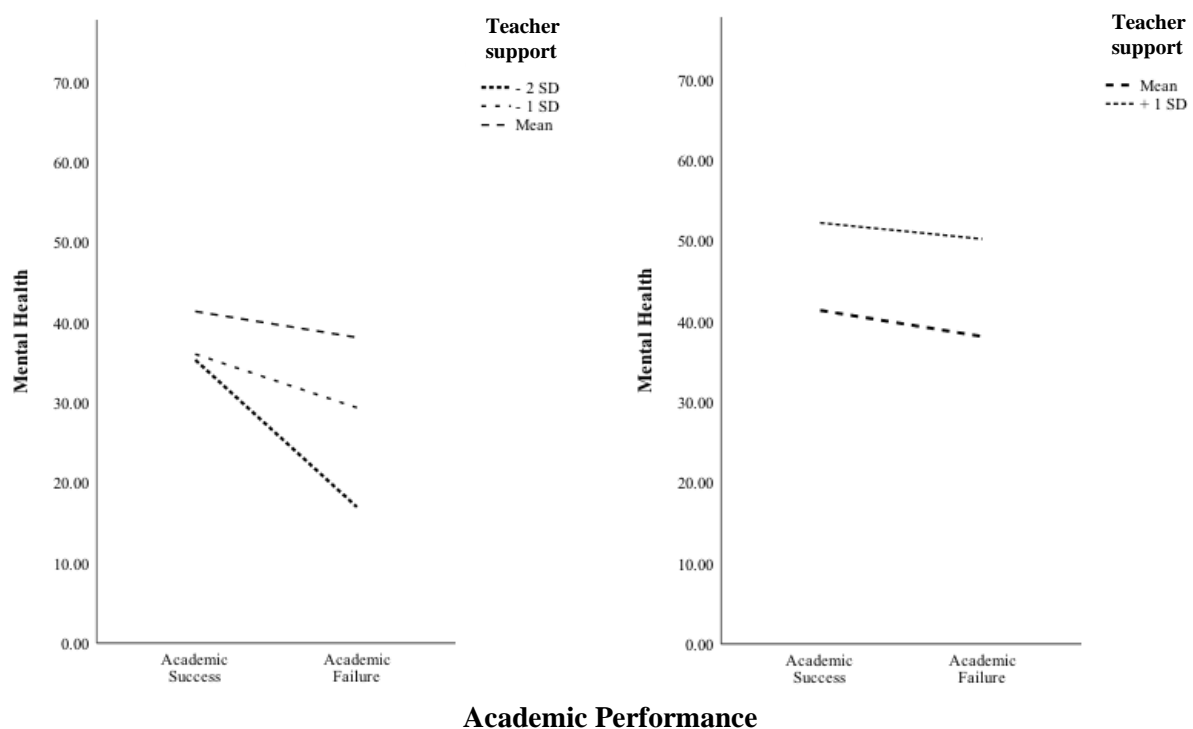


Figure 3: *The Left graph* shows simple slopes in reported teacher support of -2 SD, -1SD and mean. *The right graph* shows simple slopes in reported teacher support of mean and +1SD. Academic success (- 1 SD) = 0, academic failure (+ 1 SD) = 2.2. Y-Axis = scores in MCH-SF (Range = 0-70). In teacher support: - 2 SD = scores of 6.2, - 1 SD = 9.9, mean = 13.6, + 1 SD = 17.3.

The next set of analyses included examining the moderating role of parenteral school monitoring. The same procedure was used for examining whether the presence of parental school monitoring had a protective role in the association between academic performance and mental health. However, the interaction effect of parental school monitoring was not significant using the hierarchical linear regression in this sample.

6 DISCUSSION

This thesis aimed to examine whether academic performance and school social capital were associated with positive mental health conceptualized by emotional, psychological, and social well-being. In addition, whether two dimensions of school social capital, namely teacher support and parental school monitoring, had a protective role in the association between academic performance and mental health.

The present thesis provides insights into protective aspects for well-being by examining academic performance and several dimensions of school social capital in association with positive mental health in a comprehensive community-based sample. First, the result indicated that academic performance was associated with good mental health. The association remained after adjustments for physical activity, subjective socioeconomic status, and gender, although weaker in size. Further, there was also evidence for the association of school social capital dimensions and mental health. Notably, high levels in all dimensions (peer support, teacher support, student health-team, and parental school monitoring) of school social capital were associated with good mental health. Furthermore, while all dimensions were entered simultaneously, teacher support had the strongest association with mental health. Next, the findings also indicated that teacher support has a protective role in the association between academic achievement and mental health. In other words, the result indicated that the presence of teacher support could mitigate the impact of academic failure on mental health.

6.1 Method discussion

Despite novel findings offered by this thesis, the result should be interpreted in light of its strength and limitations, and several limitations deserve notice. The first limitation of the present thesis was due to the cross-sectional design, and causality cannot be established. Therefore, there is a possibility for several plausible explanations of the associations. A second limitation concerns the use of self-reported data that includes the risk of misleading reporting in critical variables, i.e., information bias (Åslund & Nilsson, 2013). An alternative approach might be using a medical register and school register to measure mental health and academic performance (Bruce et al., 2018). However, such information was not available for the present study. Besides, the present study used self-experienced variables, such as

experienced teacher support. Furthermore, information bias affects the internal validity, and there was not possible to completely exclude the risk of misleading reporting, particularly in terms of sensitive items. Although, the data were screened to manage information bias and detect usurious participants. Notably, exclusion bias was considered simultaneously in the screening, and each outlier was analyzed in-depth.

Previous studies of social capital have debated how the concept of social capital should be interpreted and measured (Dufur et al., 2013). For example, in sociology, social capital is often interpreted from a consensus and conflict perspective (Ritzer & Stepnisky, 2017). In contrast, this thesis followed James Coleman's (1988) definition of social capital by capturing several forms of bridging and bonding social capital within social networks that facilitate specific actions. This definition aligns with many studies within public health (e.g., Dufur et al., 2013; Åslund & Nilsson, 2013; Lindfors et al., 2017; Johnson et al., 2017), but it always includes the risk of being criticized on how social capital is interpreted. In addition, the present thesis uses school social capital as a framework, which has a clear definition and captures different bonds on student, classroom, and school level (Coleman, 1988; Tsang 2010). Thus, Coleman's thoughts of the framework were followed, which reduces the risk to fail in the interpretation of the framework. Beyond the school social capital framework, the present thesis also applied a supporting model (i.e., Astin's model), which described how adolescents' characteristics can interact with social factors and leads to the outcome.

With regard to the validity and reliability, Söderqvist & Larm (2021) has formerly evaluated MCH-SF using this specific sample, and the overall reliability was considered high to very high. For instance, the convergent validity was considered strong, showing that this instrument measures emotional, psychological and social well-being. Given their conclusion, MHC-SF was considered useful for the surveillance of mental well-being among Swedish adolescents. However, in SALVe 2020, the Swedish version of MHC-SF was used, although three minor adjustments were made in the phrasing compared to the original versions. These adjustments were applied based on focus group interviews (Söderqvist & Larm, 2021). Beyond this, MCH-SF is used in many studies worldwide (Keyes, 2009). In this particular thesis, the internal reliability revealed an alpha above .80, demonstrating coherence between the items and internal consistency (Robinson, 1991). The dimensions of school social capital, on the other hand, have not been validated before in this composition. However, the factor analysis showed coherence between the items using the Kaiser criterion (i.e., Eigenvalue above 1.0). Moreover, the individual items have been used in previous studies, yet all dimensions showed good alpha and inter-item correlation (see Robinson et al., 1991).

Another aspect regarding quality, SALVe, has been implemented biannually since the end of the 20th century and showed stable results across time (Åslund & Nilsson, 2013). Consequently, it is a promising indication of the instrument's face validity and reliability (Bruce et al., 2018). In addition, SALVe is a community-based survey inviting all schools from Vestmanland (Söderqvist & Larm, 2021), which reduces the risk of selection bias. Although reduced risk, it is unclear to what extent participants not included in the survey may have influenced the result. Likewise, there is a risk that unmeasured elements might affect the result, for example, parental education, substance use, or social status, to name a

few unmeasured elements. Nonetheless, this thesis adjusted for well-known risk factors for mental health, i.e., gender, physical activity, and subjective socioeconomic status (Biddle & Asare, 2011). Besides, from a data analytic perspective, entering too many variables in an analysis can be led to unbalanced data, thus increase the risk for violation of assumptions or analytical biases (Field, 2018). Accordingly, this thesis revealed reasonable standard errors, i.e., low standard errors are good for test reliability (Bruce et al., 2018; Creswell & Creswell, 2018).

This thesis also offered several strengths. In particular, the community-based sample with a relatively large sample is quite representative of Sweden. Consequently, as this thesis examined associations, the result is, to some extent, possible to generalize to other adolescent populations in a similar context (Åslund & Nilsson, 2013; SCB, 2021). At first, the external validity was considered relatively high. However, the response rate of 71 % was a disadvantage, which negatively impacted the external validity. In addition, another disadvantage was the internal loss due to participants do not complete the whole questionnaire. Therefore, it is not possible to conclude how the result was affected by the missing values. Although, an advantage was that all analyses showed reasonable effect size and reached statistical power (Cohen, 2013).

A particular strength includes that this thesis had a foundation to examine several dimensions of school social capital. In previous studies, school social capital has often been captured with a single dimension or part of an overall measure of social capital (Wu et al., 2010; Dufur et al., 2013). When the school social capital is captured by one dimension, the result can lead to misleading conclusions because the different dimensions contribute to mental health with different densities. Therefore, the present thesis used four dimensions to capture school social capital. Moreover, relatively few studies have examined the relationship between school social capital and well-being conceptualized by several dimensions. Previous studies have often investigated school social capital with mental diagnoses (e.g., Colaroosi & Eccles, 2003). Therefore, the present thesis contributes to other nuances of mental health, such as emotional, psychological, and social well-being. Thereby, this thesis can supplement mental illness screening with essential information about positive aspects of mental health.

6.2 Ethics discussion

First, no result was presented on the individual level. Second, the author was faithful to statistical confidentiality by not spread the information and saved the data set on a computer with a password. Moreover, the author reveals no potential conflict of interest regarding research and authorship, such as publication bias (see Creswell & Creswell, 2018). Hence, the author had a positivistic and objective approach when interpreting the result and reported the data strictly without subjective interpretations. Besides, this thesis was a learning opportunity, and it was no advantage for the author to report a misleading result. Because of the learning opportunity, no financiers were involved, therefore no risk for funding bias, i.e., when a financier wants to influence the result (Kimsy, 2012). Besides the authors' considerations, the department of public health at Region Vestmanland has not collected any

names or id-number. All participants have been informed about the study's purpose, and that participation is voluntary. Thus, each participant gave consent to participate and was allowed to leave the study at any time. Finally, SALVe has acquired ethical approval from the ethics review authority (Söderqvist & Larm, 2021).

6.3 Result discussion

Not surprisingly, this thesis identified an association between academic performance and mental health. The findings indicate that higher levels of academic performance seemed beneficial for mental well-being. The result was consistent with previous studies examining academic performance and mental health (Keyes et al., 2012; Fink, 2014; Deighton et al., 2017; O'Connor et al., 2019). A more novel finding included that academic performance was associated with mental health when conceptualized mental health by emotional, psychological, and social well-being, particularly by showing this association in a community-based sample of adolescents. Predominantly studies from the US (e.g., Keyes et al., 2012; Fink, 2014) have shown interest in examining the association of positive mental health and academic performance. Indeed, Deighton et al. (2017) have proposed a path where academic failure leads to mental health problems. However, this study cannot exclude that there potentially exists a bidirectional association and academic performance improves adolescent's well-being. However, Astin's (1997) model supports the direction of the association. In sum, the present thesis supports the notion of the relationship between mental health and academic performance. It provides novel information about emotional, psychological, and social well-being even if the dimensions were summarized.

The dimensions of school social capital and positive mental health were associated. To the author's knowledge, before this thesis, relatively few studies have examined the association between these (i.e., peers, teacher, parents, and health-team) dimensions simultaneously with mental health. In particular, very few studies have investigated these dimensions with the positive aspects of mental health and considered several dimensions of well-being. However, there is reasonable evidence for the fact that these dimensions of school social capital can have an impact on well-being. Considering adolescents spend much of their time in school, good social relationships facilitate adolescent's adjustment into the social context (Dufur et al., 2013). For instance, if an adolescent has someone to eat lunch with and hang out with during school hours, this individual is more likely to feel good and perform in school than an adolescent who is lonely without support. In other words, the same principle applies to social capital as financial capital, and it is easier to achieve outcomes when possessing assets (Dufur et al., 2008; Dufur et al., 2013; Dufur et al., 2019). Further, measurements of well-being often consist of one dimension, which commonly corresponds to emotional well-being (Eriksson et al., 2012). In contrast, this thesis considered emotional well-being, and it also considered components as social and psychological well-being (Keyes et al., 2012; Fink, 2014). Potentially, school social capital may have a high impact on one or more dimensions of well-being since all dimensions contribute more or less to well-being among adolescents.

A critical question in this thesis included whether the school social capital dimensions can be protective in the association between academic performance and mental health. The result showed that teacher support might mitigate the consequences of academic failure on mental health. Previous studies have suggested that more research is needed in representative population to examine the association between academic performance and positive mental health, for instance, examine whether social factors influencing the association (Goldfeld et al., 2016; O'Connor et al., 2019). However, a small body of evidence has shown that school social capital has a protective role in the association between academic performance and mental health (Wu et al., 2010; Fink et al., 2014; Wentzel et al., 2016; Baik et al., 2019). The present thesis supports these findings and contributes by providing some novel insights. For instance, Wentzel et al. (2016) highlighted the importance of emotional support from parents in school performance. The findings from the present thesis supported that teacher support is protective for mental health in terms of academic failure, and this thesis adds information about psychological and social well-being.

A more novel finding was that teacher support did not influence before adolescents reported at least a 4.8 in teacher support scores. Potentially, adolescents need to achieve a certain amount of teacher support before it acts protective. However, more advanced studies are needed to draw further conclusions about the cut-off where the teacher support starts to operate protective.

6.4 Future research and Implications

In short, future research is suggested within the topic of school social capital, first to establish the duration of the association between school social capital and positive mental health, such as how the association changes or persists across time. This thesis can be seen as a pilot study and further assess the findings with more advanced study designs, e.g., cohort studies. An interesting suggestion for further research is to assess at which level teacher support starts to act protective. The present thesis suggests a cut-off at approximate scores of five in teacher support. However, a further question is why teacher support does not affect adolescents with reported scores below five, therefore more research is needed within this topic.

Moreover, future research may also broaden the approach and examine the role of school social capital related to health inequities, such as in socioeconomic status and financial inequities, e.g., how school social capital can influence well-being among immigrant adolescents. There are, however, beneficial implications for public health practitioners already from the present thesis. This thesis underscores the importance of promoting mental health in school, as the school are one important arena to promote health. Besides, the present thesis captures a picture of how social capital can act in the school system. In sum, the present study highlights essential aspects valuable for promoting good mental health in school.

6.5 Conclusion

This thesis contributes to the existing literature on academic achievement, school social capital, and mental health. The main findings from this thesis demonstrated associations between academic performance, school social capital, and positive mental health. The main result was, in short, that better academic performance was associated with higher levels of mental health. In addition, all dimensions of school social capital were associated with mental health. Higher levels of school social capital indicated higher levels of mental health. In particular, the strongest association was found between the dimension of teacher support and positive mental health. Further, this thesis advances the field by demonstrating that the association between academic achievement and well-being could partly be accounted from school social capital. Notably, this thesis contributes by adding a nuance of academic performance and mental health by showing that teacher support seems to play an essential protective role in the association between academic performance and mental health, especially when several dimensions conceptualize well-being. This information is highly relevant as mental health problems are a topical public health issue. In sum, the results of this thesis suggest that the school system is one important arena where mental health can be promoted by demonstrating how social capital can act protective in the school environment and showing its effect on the association of academic performance and mental health.

REFERENCES

- Aiken, L.S., West, S. G., Reno, R. R. (1991). Multiple regression: Testing and interpreting interactions. Sage.
- Astin, A. W. (1997). *What matters in college?*. JB.
- Baik, C., Larcombe, W., & Brooker, A. (2019). How universities can enhance student mental well-being: the student perspective. *Higher Education Research & Development*, 38(4), 674-687. <https://doi.org/10.1080/07294360.2019.1576596>
- Baron, R., & Kenny, D. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal Of Personality And Social Psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Bor, W., Dean, A., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal Of Psychiatry*, 48(7), 606-616. <https://doi.org/10.1177/0004867414533834>
- Brambor, T., Clark, W., & Golder, M. (2006). Understanding interaction Models: Improving Empirical Analyses. *Political Analysis*, 14(1), 63-82. <https://doi.org/10.1093/pan/mpi014>
- Bruce, N., Pope, D. & Stanistreet, D. (2018). *Quantitative methods for health research: a practical interactive guide to epidemiology and statistics*. 2nd edition. Hoboken: Wiley.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Academic press.
- Colarossi, L., & Eccles, J. (2003). Differential effects of support providers on adolescents' mental health. *Social Work Research*, 27(1), 19-30. <https://doi.org/10.1093/swr/27.1.19>
- Coleman, J. (1988). Social Capital in the Creation of Human Capital. *American Journal Of Sociology*, 94, S95-S120. <https://doi.org/10.1086/228943>
- Creswell, J.W. & Creswell, J.D. (2018). *Research desing: qualitative, quantitative, and mixed methods approaches*. 5th ed. Los Angeles: Sage.
- Deighton, J., Humphrey, N., Belsky, J., Boehnke, J., Vostanis, P., & Patalay, P. (2017). Longitudinal pathways between mental health difficulties and academic performance during middle childhood and early adolescence. *British Journal Of Developmental Psychology*, 36(1), 110-126. <https://doi.org/10.1111/bjdp.12218>

- Desocio, J., & Hootman, J. (2004). Children's Mental Health and School Success. *The Journal Of School Nursing*, 20(4), 189-196.
<https://doi.org/10.1177/10598405040200040201>
- Dufur, M., Parcel, T., & Mckune, B. (2008). Capital and Context: Using Social Capital at Home and at School to Predict Child Social Adjustment. *Journal Of Health And Social Behavior*, 49(2), 146-161. <https://doi.org/10.1177/002214650804900203>
- Dufur, M., Parcel, T., & Troutman, K. (2013). Does capital at home matter more than capital at school? Social capital effects on academic achievement. *Research In Social Stratification And Mobility*, 31, 1-21. <https://doi.org/10.1016/j.rssm.2012.08.002>
- Dufur, M., Thorpe, J., Barton, H., Hoffmann, J., & Parcel, T. (2019). Can Social Capital Protect Adolescents from Delinquent Behavior, Antisocial Attitudes, and Mental Health Problems?. *Archives Of Psychology*, 3(6).
<https://doi.org/10.31296/aop.v3i6.119>
- Eriksson, U., Hochwälder, J., Carlsund, Å., & Sellström, E. (2012). Health outcomes among Swedish children: the role of social capital in the family, school and neighbourhood. *Acta Paediatrica*, 101(5), 513-517. <https://doi.org/10.1111/j.1651-2227.2011.02579.x>
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191. <https://doi.org/10.3758/bf03193146>
- Field, AP (2018). *Discovering statistics using IBM SPSS statistics*. (5. ed.) London: Sage Publications.
- Fink, J. (2014). Flourishing: Exploring Predictors of Mental Health Within the College Environment. *Journal Of American College Health*, 62(6), 380-388.
<https://doi.org/10.1080/07448481.2014.917647>
- Gilbert, K., Quinn, S., Goodman, R., Butler, J., & Wallace, J. (2013). A meta-analysis of social capital and health: A case for needed research. *Journal Of Health Psychology*, 18(11), 1385-1399. <https://doi.org/10.1177/1359105311435983>
- Goldfeld, S., Kvalsvig, A., Incledon, E., & O'Connor, M. (2016). Epidemiology of positive mental health in a national census of children at school entry. *Journal of Epidemiology And Community Health* 71(3), 225-231. <https://doi.org/10.1136/jech-2015-207061>
- Halunga, A., Orme, C., & Yamagata, T. (2017). A heteroskedasticity robust Breusch–Pagan test for Contemporaneous correlation in dynamic panel data models. *Journal Of Econometrics*, 198(2), 209-230. <https://doi.org/10.1016/j.jeconom.2016.12.005>

- Hoaglin, D., & Welsch, R. (1978). The Hat Matrix in Regression and ANOVA. *The American Statistician*, 32(1), 17. <https://doi.org/10.2307/2683469>
- Huppert, F. (2009). Psychological Well-being: Evidence Regarding its Causes and Consequences. *Applied Psychology: Health And Well-Being*, 1(2), 137-164. <https://doi.org/10.1111/j.1758-0854.2009.01008.x>
- Johnson, C., Rostila, M., Svensson, A., & Engström, K. (2017). The role of social capital in explaining mental health inequalities between immigrants and Swedish-born: a population-based cross-sectional study. *BMC Public Health*, 17(1). <https://doi.org/10.1186/s12889-016-3955-3>
- Keogh, E., Bond, F. W., French, C. C., Richards, A., & Davis, R. E. (2004). Test anxiety, susceptibility to distraction and examination performance. *Anxiety, Stress & Coping*, 17(3), 241-252.
- Keyes, C. (2005). Mental Illness and/or Mental Health? Investigating Axioms of the Complete State Model of Health. *Journal Of Consulting And Clinical Psychology*, 73(3), 539-548. <https://doi.org/10.1037/0022-006x.73.3.539>
- Keyes, C. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62(2), 95-108. <https://doi.org/10.1037/0003-066x.62.2.95>
- Keyes, C, L, M. (2009). Atlanta: *Brief Description of the Mental Health Continuum Short Form (MHC-SF)*. Retrieved April 13, 2021, from: <https://www.aacu.org/sites/default/files/MHC-SFEnglish.pdf>.
- Keyes, C., Eisenberg, D., Perry, G., Dube, S., Kroenke, K., & Dhingra, S. (2012). The Relationship of Level of Positive Mental Health With Current Mental Disorders in Predicting Suicidal Behavior and Academic Impairment in College Students. *Journal Of American College Health*, 60(2), 126-133. <https://doi.org/10.1080/07448481.2011.608393>
- Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., & Omigbodun, O. et al. (2011). Child and adolescent mental health worldwide: evidence for action. *The Lancet*, 378(9801), 1515-1525. [https://doi.org/10.1016/s0140-6736\(11\)60827-1](https://doi.org/10.1016/s0140-6736(11)60827-1)
- Kimsky, S. (2012). Do Financial Conflicts of Interest Bias Research?. *Science, Technology, & Human Values*, 38(4), 566-587. <https://doi.org/10.1177/01622243912456271>
- Lawrence, D., Dawson, V., Houghton, S., Goodsell, B., & Sawyer, M. (2019). Impact of mental disorders on attendance at school. *Australian Journal Of Education*, 63(1), 5-21. <https://doi.org/10.1177/0004944118823576>

- Lindfors, P., Minkkinen, J., Rimpelä, A., & Hotulainen, R. (2017). Family and school social capital, school burnout and academic achievement: a multi-level longitudinal analysis among Finnish pupils. *International Journal Of Adolescence And Youth*, 23(3), 368-381. <https://doi.org/10.1080/02673843.2017.1389758>
- Mansfield, E., & Helms, B. (1982). Detecting Multicollinearity. *The American Statistician*, 36(3a), 158-160. <https://doi.org/10.1080/00031305.1982.10482818>
- Morrissey, T., Hutchison, L., & Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Developmental Psychology*, 50(3), 741-753. <https://doi.org/10.1037/a0033848>
- Miller, J., Stromeier, W., & Schwieterman, M. (2013). Extensions of the Johnson-Newman technique to Linear Models with Curvilinear Effects: Derivations and analytical tools. *Multivariate Behavioural Research*, 48(2), 267-300. <https://doi.org/10.1080/00273171.2013.763567>
- O'Connor, M., Cloney, D., Kvalsvig, A., & Goldfeld, S. (2019). Positive Mental Health and Academic Achievement in Elementary School: New Evidence From a Matching Analysis. *Educational Researcher*, 48(4), 205-216. <https://doi.org/10.3102/0013189X19848724>
- Putwain, D. W. (2009a). Situated and contextual features of test anxiety in UK Adolescent students. *School Psychology International*, 30(1), 56-74.
- Putwain, D., Connors, L., & Symes, W. (2009b). Do cognitive distortions mediate the test anxiety–examination performance relationship?. *Educational Psychology*, 30(1), 11-26. <https://doi.org/10.1080/01443410903328866>
- Region Vestmanland (2020). *Liv och Hälsa ung 2020*. Retrieved April 13, 2021, from: <https://regionvastmanland.se/globalassets/utveckla-vastmanland/liv-och-halsa-ung/2020/informationsmaterial/information-elever---liv-och-halsa-ung.pdf>
- Ritzer, G., & Stepnisky, J. (2017). *Modern sociological theory*. Sage publications.
- Robinson, J.P., Shaver, P.R., Wrightsman, L.S. & Andrews, F.M. (1991). *Measures of personality and social psychologic attitudes*. San Diego: Academic Press
- Rostila, M. (2010). The Facets of Social Capital. *Journal For The Theory Of Social Behaviour*, 41(3), 308-326. <https://doi.org/10.1111/j.1468-5914.2010.00454.x>
- Svenska Statistiska Central Byrån (SCB). (2021). *Kolada*. Retrieved April 28, 2021, from: https://kolada.se/verktyg/jamforaren/?_p=jamforelse&focus=27507&tab_id=82770

- Seligman, M., Ernst, R., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: positive psychology and classroom interventions. *Oxford Review Of Education*, 35(3), 293-311. <https://doi.org/10.1080/03054980902934563>
- Streiner, D.L., Norman, G.R., & Cairney, J. (2015). *Health measurement scales: a practical guide to their development and use*. Oxford University Press, US.
- Söderqvist, F., & Larm, P. (2021). Psychometric evaluation of the mental health continuum – short form in Swedish adolescents. *Current Psychology*.
<https://doi.org/10.1007/s12144-021-01626-6>
- Trudel-Fitzgerald, C., Millstein, R., von Hippel, C., Howe, C., Tomasso, L., Wagner, G., & VanderWeele, T. (2019). Psychological well-being as part of the public health debate? Insight into dimensions, interventions, and policy. *BMC Public Health*, 19(1).
<https://doi.org/10.1186/s12889-019-8029-x>
- Tsang, K. K. (2010). School social capital and school effectiveness. *Education journal*, 37(1-2), 119-136.
- VanderWeele, T., Chen, Y., Long, K., Kim, E., Trudel-Fitzgerald, C., & Kubzansky, L. (2020). Positive Epidemiology?. *Epidemiology*, 31(2), 189-193.
<https://doi.org/10.1097/ede.0000000000001147>
- Wentzel, K., Russell, S., & Baker, S. (2016). Emotional support and expectations from parents, teachers, and peers predict adolescent competence at school. *Journal Of Educational Psychology*, 108(2), 242-255. <https://doi.org/10.1037/edu0000049>
- World Health Organization (2004). Promoting mental health: Concepts, emerging evidence, practice (Summary report). Retrieved May 1, 2021, from:
https://www.who.int/mental_health/evidence/en/promoting_mhh.pdf
- World Health Organization (2013). *Mental health action plan 2013–2020*. Retrieved April 13, 2021, from:
http://apps.who.int/iris/bitstream/10665/89966/1/9789241506021_eng.pdf.
- Wu, Q., Palinkas, L., & He, X. (2010). An Ecological Examination of Social Capital Effects on the Academic Achievement of Chinese Migrant Children. *British Journal Of Social Work*, 40(8), 2578-2597. <https://doi.org/10.1093/bjsw/bcq051>
- Åslund, C., & Nilsson, K. (2013). Social capital in relation to alcohol consumption, smoking, and illicit drug use among adolescents: a cross-sectional study in Sweden. *International Journal For Equity In Health*, 12(1), 33. <https://doi.org/10.1186/1475-9276-12-33>

APPENDIX A: QUESTIONNAIRE

This is a free translation of the original Swedish questionnaire.

#	Item						
1	Are you...?	Female	Male	other			
2	Imagine society as a ladder. If you think about your family's economy compared to society as a whole, where should you place your family?	At the bottom	2	3	4	5	6 At the top
How careful is it at your home that you?... MCH-SF							
3	Take care of schoolwork?	Not careful at all	Not so careful	Quite carefully	Very carefully		
4	That you do not skip classes?	Not careful at all	Not so careful	Quite carefully	Very carefully		
5	When you come home?	Not careful at all	Not so careful	Quite carefully	Very carefully		
6	When you go to bed?	Not careful at all	Not so careful	Quite carefully	Very carefully		
In the last month, how often have you felt... MCH-SF							
7	Happiness, joy?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
8	An interest in life?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
9	You satisfied/satisfied?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
10	That you have something important to contribute to society?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
11	That you belong to a community?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
12	That our society is becoming a better place?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
13	That people are basically good?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
14	That the way society works makes sense?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
15	That you like most of your personality?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
16	That you're good at taking responsibility for your daily life?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
17	That you have warm and trusting relationships with others?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
18	That you've experienced things that challenged you and made you grow as a person?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
19	That you have the confidence to have your own thoughts and opinions and that you dare to express them?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
20	That you're going somewhere in life and life has meaning?	never	1 or 2 times	One time/w	2-3 times/w	Almost daily	Daily
School performance							
21	Do you often skip classes?	no	Yes, sometime per semester	Yes, once a month	Yes, 2-3 times a month	Yes, once a week	Yes, several times a week
22	Do you have an F grade on any subjects?	no	Yes in 1-2 topics	Yes, in 3-4 subjects	Yes, in 5 or more topics		
How well are the following claims correct?							
23	Schoolwork makes me curious and interested so I feel like learning more?	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
24	I regularly find out how I'm doing in school?	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
25	I know who I can talk to if I feel unsafe or get mistreated at school?	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
26	I've been studying in class.	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
How well are the following claims correct?							
27	I have friends at school who want to be with me.	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
28	My teachers expect me to achieve the goals in all subjects	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
29	I feel like I'm being noticed by the teachers when I'm doing something good.	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
30	I feel like my teachers are listening to my opinions	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
31	I feel that I get the help I need in schoolwork	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
32	I think my teachers give boys and girls the same conditions to cope with schoolwork	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
33	I think my teachers give boys and girls the same conditions to cope with schoolwork	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
34	I know which forums the views can be expressed	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
35	I think school staff listen to our opinions and take them seriously?	Matches exactly	Matches good	Matches to some extent	Do not match	Does not match at all	
Consider the following statement							
36	I can get help from the student health team if I need	Matches exactly	Matches less good	Do not match	No opinion		
37	If the student health team can't give me the help I need, the team will refer me and my parents further	Matches exactly	Matches less good	Do not match	No opinion		
Physical activity							
38	How much do you move on average per day?	Less than 30 minutes a day	30-60 minutes	More than 60 minutes a day			
39	How often do you exercise so you get out of breath & sweaty?	Every day	3-6 times / w	1-2 times / w	1-3 times a month	Less than once a month	never



MÄLARDALEN UNIVERSITY
SWEDEN

Box 883, 721 23 Västerås **Tfn:** 021-10 13 00
Box 325, 631 05 Eskilstuna **Tfn:** 016-15 36 00
E-mail: info@mdh.se **Web:** www.mdh.se