



CFBUPH | Centre for research on child
and adolescent mental health



UNIVERSITY OF GOTHENBURG
DEPT OF EDUCATION AND SPECIAL EDUCATION

Final Scientific Report

RESEARCH PROGRAMME 2013–2020

The impacts of changed living conditions on child
and adolescent mental health



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On the Cover:

Participants at the First Advisory Board Meeting in 2013

From the left, sitting: Sir Michael Rutter (King's College London), Magdalena Janus (McMaster University, Canada), Ulrike Ravens Sieberer (University Clinic Hamburg, Germany), Joanna Giota (University of Gothenburg), Maria Nilsson (CFBUPH). From the left, standing: Jan-Eric Gustafsson (University of Gothenburg), Daniel Bergh (CFBUPH), Michael Hansen (University of Gothenburg), Curt Hagquist (CFBUPH), Steve Zubrick (University of Western Australia).

Final Scientific Report

RESEARCH PROGRAMME 2013–2020

The impacts of changed living conditions on child
and adolescent mental health

Funded by a grant from the Swedish Research Council for
Health, Working Life and Welfare (Forte)

December 30th 2020

Curt Hagquist
Principal Investigator

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PREFACE

This report summarises seven years of research on child and adolescent mental health, mainly funded by the Swedish Research Council for Health, Working Life and Welfare (Forte). What has been achieved is the result of a collaborative and interdisciplinary work conducted by researchers at Karlstad University and the University of Gothenburg. The outcomes from the programme work are presented in almost 70 published peer-reviewed papers and in a number of papers not yet published but underway in review processes. In addition, the results from the research programme are presented in fact sheets in English and Swedish. These fact sheets and further information about the programme are available on the the websites www.gu.se/en/research/the-impacts-of-changed-living-conditions-on-child-and-adolescent-mental-health and www.kau.se/en/cfbuph/research-projects/research-projects/child-and-adolescent-mental-health/forte-program-about.

The programme work has been strongly supported by an Advisory Board, including prominent researchers from Australia, Canada, Germany and the UK. We are deeply grateful for the engagement from the members of the advisory board. We also want to express our gratitude to Forte and other funders of the research programme.

We do hope that the outcomes from the programme work add to the current research field and will stimulate further research on social determinants of child and adolescent mental health. The social consequences of the corona pandemic also make the research on young people's mental health an even bigger challenge.

Karlstad in December 2020

Curt Hagquist*

Principal Investigator



Professor Curt Hagquist. Photo: Jessica Segerberg

*Until September 2020, director of the Centre for Research on Child and Adolescent Mental Health at Karlstad University.

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INTRODUCTION

Mental-ill health causes enormous burdens worldwide – economically and personally – which was clearly highlighted in a report published by The Lancet Commission on global mental health and sustainable development (Patel et al. 2018). This is particularly important in adolescence, a period in the life course when mental health problems show a sharp rise in incidence, and when mental health problems have an especially marked impact on functioning and long-term prognosis (Maughan and Collishaw, 2015). It is therefore of major concern that adolescent mental health problems have shown an increase in their prevalence in recent decades (Bor et al. 2014; Collishaw 2015).

In the last decade, the mental health of young people has also been given a more prominent place on the Swedish national political agenda. Many preventive measures and programmes have also been implemented, but self-reported mental health problems continue to increase, especially among girls (FHM, 2018a). Similarly, the statistics on young people with psychiatric diagnoses as well as the prescribing of psychotropic drugs also point in an upward direction (Socialstyrelsen, 2020). In contrast, during the past two decades the use of alcohol and tobacco has decreased among students 15-16 years old in Sweden (Guttormsson, 2020).

Adolescent mental health – 25 years of public focus in Sweden

After decades without deep economic downturns, Sweden faced an economic recession in the early 1990s with mass unemployment and deteriorating social and economic living conditions. The economic crisis of the 1990s largely affected young people (Hagquist, 1997; Hagquist & Starrin, 1997; SOU, 2000). Youth unemployment skyrocketed. One in three young people aged 16–23 received some form of unemployment benefit in 1994 (SOU, 2000). Many young people were also indirectly affected when their parents became unemployed (SCB, 1997). Seen from a public health perspective, the 1990s are characterized by complexity. Unlike psychosomatic disorders and hospitalization for depression, suicides among young people did not increase during the 1990s (Hagquist et al., 2000). Among young people, the suicide rate remained at about the same level as before, with signs of a downward trend.

Since the 1990's economic crisis, young people's increasing mental health problems have been a recurring theme in the Swedish public health debate. The alarm reports have replaced each other and the impact in the media has been great (Beckman & Hagquist, 2010). However, the epidemiological knowledge base was insufficient and did not allow reliable conclusions about the time trend (SOU, 1997, 1998). The lack of data made it difficult to assess the impact of these changes on the health outcomes of young people, especially the changes in mental health among young people (SOU, 1997). To address these difficulties and to increase and improve the information about current trends in children's and adolescents' mental health, a Swedish governmental commission proposed that a new recurrent nation-wide study should be undertaken (SOU, 1998).

Given the uncertainties about the scientific knowledge base, in 2010 the Royal Swedish Academy of Sciences (KVA) held two State of the science conferences on the mental health of children and young people, one on trends and one on school. While

the independent expert panel at the trend conference concluded that there had been an increase of self-reported mental health problems among older adolescents, in particular girls, the panel requested “...*data and more profound analyses in order to explain the causes of the negative trends in young people’s mental health.*” The challenge was further emphasized by the panel by stating that: “*The panel believes that it is important that the research world is now working to find the most important causes behind the increase in mental illness.*” (KVA, 2010).

Several different explanations for the deteriorating mental health among young people have been discussed. During the crisis years of the 1990s, unemployment and financial strains came into focus, later radical changes within the school were pointed out as an important driving force. The IT revolution and the rapidly increasing use of electronic media have in recent years become a common explanation for why young people are feeling worse and worse. Common to these explanations is that they are linked to obvious and major societal changes. Over time, alternative explanations have also edged the statistical stories of increased mental health problems among young people: The statistics have been questioned and claimed to reflect changed attitudes and behaviors in relation to mental health problems, rather than real changes (Wickström & Kvist Lindholm, 2020). It has proven difficult to reach agreement on explanatory models and to find causes of changes in adolescent mental health although explanations have been sought in research conducted within several different disciplines. This is illustrated by a recent report published by the Public Health Agency of Sweden suggesting that “*the fact that the functioning of the Swedish school system has deteriorated and an increased awareness of the higher demands in the labour market, have **probably** contributed to the increase in multiple health complaints among children and adolescents*” (Folkhälsomyndigheten 2018b; bold added). This statement was based on analyses on a) the associations between mental health problems and factors within the family, the socioeconomic conditions of the family, school and learning and structural changes b) the changes in prevalence of these factors, and c) systematic literature reviews. The absence of firm conclusions is logical given the analytical approach because “...*it is impossible to draw simple conclusions based on two correlated trends at the population level.*” (Collishaw 2015).

The governmental research funders responded quickly to the requests made at the state of the state of the science conferences organised by KVA in 2010. In 2011, Formas, VR, FAS (Forte) and Vinnova jointly announced SEK 300 million for research on the mental health of children and young people. High hopes were attached to the call and the research groups that were granted, but the result of the initiative did not turn out as expected. In a report published by the four research funders in 2018, the scientific evaluation group stated that “*Only a few of the socially relevant knowledge gaps identified by KVA have been addressed in the research initiative*” (Forte, 2018). In other words, according to the review report many of the knowledge gaps remain even though other research groups have addressed some of the research issues that were highlighted at the KVA conferences. The social consequences of the corona pandemic and potential threats to young people’s mental health pose not least social science research further challenges.

THE FORTE PROGRAMME – BACKGROUND AND PROGRESS

A programme grant was awarded the Centre for Research on Child and Adolescent Mental Health (CFBUPH) at Karlstad University in February 2013 by the Swedish Research Council for Health, Working Life and Welfare (Forte, previously FAS). The title of the programme is *“The impacts of changed living conditions on child and adolescent mental health”*. The programme is run in collaboration between CFBUPH and the Department of Education and Special Education at the University of Gothenburg. The grant amounted to 6 million SEK for the 2013–2016 time period. Based on a progress report for 2013–2015, Forte decided, in October 2015, to extend the programme funding for another three years (2016–2018) implying another 6 million SEK. The grant was for disposition until September 30th 2020.

To support the development of the programme, and to continuously evaluate the programme work, internationally leading experts from different disciplines were invited to be members of a scientific advisory board already at the stage of application for funding. The international advisory board includes members from Australia, Canada, Germany and UK. Advisory board meetings have been held in 2013 (Karlstad), 2014 (Gothenburg), 2016 (Karlstad), 2017 (Gothenburg) and 2019 (Karlstad). The role of the advisory board was neither executive nor to be a steering group, but rather a review board intended to give recommendations.

Advisory Board Meeting in 2017



Advisory Board Meeting in 2017. From the left: Steve Zubrick (University of Western Australia), Curt Hagquist (CFBUPH), Daniel Bergh (CFBUPH), Sir Michael Rutter (King's College, London), Doug Willms (University of New Brunswick, Canada), Magdalena Janus (McMaster University, Canada), Jan-Eric Gustafsson (University of Gothenburg), Brittany Evans, (CFBUPH), Annika Norell Clarke (CFBUPH), Michael Hansen (University of Gothenburg), Yunhwan Kim (CFBUPH) and Bo Nielsen (University of Gothenburg).

The members of the advisory board are:

- David Andrich, Chapple Professor, Graduate School of Education, The University of Western Australia, Australia.
- Candace Currie, Professor, Glasgow Caledonian University Public Health Department, London, UK.
- Magdalena Janus, Professor and Ontario Chair in Early Child Development, Offord Centre, McMaster University, Canada.
- Ulrike Ravens-Sieberer, Professor, Research Division for Child Public Health, University Clinic Hamburg, Germany.
- Sir Michael Rutter, Professor of Developmental Psychopathology, Institute of Psychiatry, Psychology and Neuroscience, King's College, London, UK.
- Doug Willms, Professor, The Learning Bar Inc, Canada.
- Steve Zubrick, Professor, The University of Western Australia and Telethon Kids Institute, Perth, Australia.

CONTEXTUAL BACKGROUND TO THE PROGRAMME

The contextual framework for the programme reflects the profound changes that have taken place during the last decades in the Swedish society, in the family structure, the school system, the labour market and in other sectors. Simultaneously, adolescents' self-reports indicate increasing mental health problems, particularly among girls. As mentioned before, a statement from the State of the Science Conference in 2010 requested: "... *data and more profound analyses in order to explain the causes of the negative trends in young people's mental health.*" The current research programme was intended to respond to the gaps in research by integrating trend analyses of child and adolescent mental health, across and within countries, with efforts to determine the impact of changes in societal and contextual factors on child and adolescent mental health at the individual level. The aim of the programme is to investigate effects of changed living conditions on child and adolescent mental health. The programme comprises two research tracks:

- Comparative analyses of societal changes and mental health trends within and between countries.
- Multilevel analyses of how changes in early life living conditions affect mental health of children and young people.

An additional major purpose with the research programme concerns the research environments. In the call for the programme grant, not just the research objectives were emphasised, but also the intention to strengthen existing research groups. It was explicitly stated by Forte that "*The purpose of programme grants is to reinforce and expand research environments in a long-term perspective.*" These two purposes are coherent and both have been an integral part of the programme work. In order to achieve both of these purposes, strong efforts have been made to attract additional funding and to recruit highly competent researchers.

DATA SOURCES

Access to reliable and relevant data was indispensable for the research programme. Since the start of the research programme established databases have been made available for the research programme and new data collections have been conducted as parts of ongoing studies.

The major data sources available for the programme comprise one longitudinal cohort study and three repeated cross-sectional studies. One of the latter ones includes data from most European countries and one solely includes Norwegian data. In the following, the status of ongoing studies is briefly described.

Longitudinal studies

Evaluation Through Follow-up (ETF)

Evaluation Through Follow-up (ETF) is a large cohort-sequential longitudinal database which includes 10 cohorts, including individuals born between 1948 and 2004. Each cohort comprises about 9000 pupils, sampled to be nationally representative. The database is administered by the Department of Education and Special Education at the University of Gothenburg. In 2017 it was given the status of national infrastructure by the Swedish Research Council, along with funding for the period 2018 – 2022. The samples are generally drawn in Grade 3, when data collection from national registers comprising background data and results on national tests starts. Register data is then added on a yearly basis for as long as the students are in the educational system, and for the purposes of specific studies data from different national registers, for example on causes of death and psychiatric diagnoses, may be added throughout the lifetime. In Grade 6 questionnaires are administered to students, parents and teachers, and the students take three cognitive ability tests. Follow-up questionnaires are administered in Grade 9 and in the final year of upper secondary school. The questionnaires cover, among other things, students' self-perceptions and different aspects of motivation, as well as their perceptions of the school and their school situation. Identical item formulations are used to the greatest possible extent in the three student questionnaires, to allow analyses of change over time. As a part of the cooperation between Karlstad and Gothenburg, measures of mental health were included in the questionnaire for Grade 9 in 2014. After a positive evaluation a selection of these measures were also included in the Grade 9 questionnaire on a permanent basis, as well as in the Grade 12 data collection in 2017, and in the Grade 6 data collection in 2017.

REPEATED CROSS-SECTIONAL STUDIES

Health Behaviour in School-aged Children (HBSC)

Health Behaviour in School-aged Children is a repeated cross-sectional study with data collections using questionnaires every four years, starting in the 1980's.

The HBSC study is conducted in collaboration with the WHO Regional Office for Europe and it currently includes 50 countries and regions across Europe and North America. Three age groups are targeted: 11, 13 and 15 year-old students. During the

2017/18 semesters a new wave of data collections was taking place. Because of restrictions imposed by the Swedish Data Protection Authority it was not possible to collect data allowing identification of schools. As a consequence, links of administrative data at the school level to the Swedish data set is not possible. It's neither possible to investigate the attrition, e.g. what characterise non-participating schools compared to participating ones. On average, the overall participating rate 2017/18 was 42 per cent which was a drop of about 30 percentage points in comparison with previous years of investigations. CFBUPH has two members in the national team that manages the HBSC study in Sweden. In 2018, Curt Hagquist was elected chair of the HBSC international Methodology Development Group.

Young in Värmland (YiV)

The Young in Värmland (YiV) is a repeated cross-sectional study targeting all grade 9 students (15–16 years old) in all 16 municipalities in the County of Värmland. The survey is run by Karlstad University, in cooperation with the local authorities in Värmland.

Data collections with questionnaires have taken place eight times in the 1988–2011 time period. The questionnaire includes questions about the students' situation in school and in leisure time, health and health-related behaviours, worry and other topics. The questionnaire was handed out in the classroom and answered anonymously. The participation rate has been high in all years, with the lowest being 84 percent. Great efforts have been made to run another data collection but it has not been possible to get sufficient support from the local school authorities.

Ungdata



The survey Young in Värmland has been of great benefit to the local public health work at Vargbro school. Principal Sven-Erik Rehn hopes the study will resume. Photo: Jessica Segerberg.

Ungdata is a national repeated cross-sectional adolescent survey conducted among municipalities in Norway. Data are collected in schools using electronic questionnaires accessible online. Participation is voluntary and the students respond anonymously. The Ungdata questionnaires cover social and health conditions and the situation in school as well as leisure time, e.g. relationship with parents and friends, leisure activities, health issues, local environment, well-being, and school issues, tobacco and drug use, electronic media use, antisocial behavior, violence and bullying. Ungdata is targeting all Norwegian school children aged 13-18 years with high participation rates. NOVA - the Norwegian Social Research Institute at OsloMet - is responsible for the national coordination of Ungdata. The regional Drug and Alcohol Competence Centers are responsible for conducting the municipal surveys.

Cross-sectional studies with data collected at a single point in time

The National Survey on Child and Adolescent Mental Health

The study was carried out in 2009 by Statistics Sweden, targeting all students in grades 6 and 9 (12 and 15 years old) in Sweden. In total 172 000 students participated and the participation rate was 83 percent. The data collections took place in schools with a questionnaire including the Strength and Difficulties Questionnaire, the Psychosomatic Problems scale and the Kidscreen-health related quality of life questionnaire. The data were collected by Statistics Sweden and are administered by the National Board of Health and Welfare. A strength of the study is that the mental health measures don't just include questions about symptoms but also impairment. The study was originally intended to be repeated every third year, but for different reasons the study hasn't been repeated yet.

RESEARCH AND PUBLICATIONS

During the programme period almost 70 peer-reviewed papers have been published by the researchers in the programme. As shown in figure 1, there is an up going trend of publications. In addition, three book chapters have been published/accepted for publication and a number of papers are currently under review.

Below, all publications are listed and categorised under the following headings: Trends economy, Trends school, Trends general, Family, Mental health, Life style, Bullying, Psychometrics and Other.

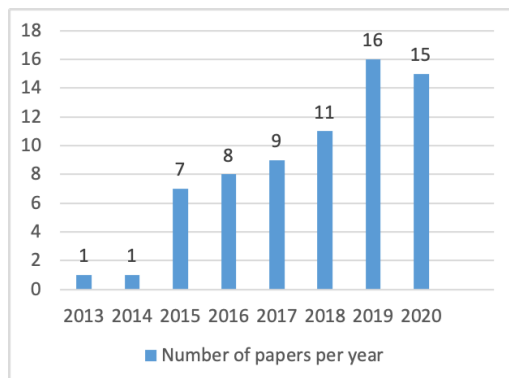


Figure 1. Number of published/accepted peer-reviewed papers distributed 2013-2020.

TRENDS ECONOMY

Major conclusions

- The deteriorated mental health during the 1990's among young people in Sweden was very likely caused by increasing economic stress.
- There is an obvious risk that adolescents' mental health will increase in the wake of the corona pandemic, when economic stress and unemployment increase.

Papers published in connection with the research programme

- Hagquist, C., & Gustafsson, J.E. (2020). I spåren av 90-talskris och coronapandemi: Ökad ekonomisk stress och psykisk ohälsa bland unga? [In the wake of the 1990's crisis and the corona pandemic: Increased economic stress and mental health problems among young people?] *Socialmedicinsk tidskrift*, 5-6, 817-831. Open access.
- Högberg, B., Strandh, M. and Baranowska, A. (2019). Transitions from temporary employment to permanent employment among young adults: The role of labor law and education systems. *Journal of Sociology*, 55(4), 689-707. doi.org/10.1177/1440783319876997. Open Access.
- Kim Y., & Hagquist, C. (2018). Trends in adolescent mental health during economic upturns and downturns: A multilevel analysis of Swedish data 1988-2008. *Journal of Epidemiology and Community Health*, 72(2), 101-108. doi:10.1136/jech-2017-209784. Open access.
- Kim, Y., & Hagquist, C. (2018). Mental health problems among economically disadvantaged adolescents in an increasingly unequal society: A Swedish study using repeated cross-sectional data from 1995 to 2011. *SSM - Population Health*, 6, 44-53. doi:10.1016/j.ssmph.2018.08.006. Open access.
- Hagquist, C., Välimaa, R., Simonsen, N., & Suominen, S. (2017). Differential Item Functioning in Trend Analyses of Adolescent Mental Health – Illustrative Examples Using HBSC-data from Finland. *Child Indicators Research*, 10(3), 673-691. doi:10.1007/s12187-016-9397-8
- Brydsten, A., Hammarström, A., Strandh, M., & Johansson, K. (2015). Youth unemployment and functional somatic symptoms in adulthood: results from the Northern Swedish cohort. *European Journal of Public Health*, 25(5), 796-800. doi.org/10.1093/eurpub/ckv038

TRENDS SCHOOL

Major conclusions

- Increased school stress is very likely to contribute to the increase of mental health problems among adolescents during the last decades, in particular among girls.
- The differences in school stress between boys and girls are already apparent in school year 6 but they are not so great.
- Students who struggle with school work feel greater stress, regardless of gender.

- Between school years 6 and 9 stress increases sharply and the gender differences grow bigger. The girls experience the worst stress.
- Relationships are important, especially contact with peers but demands in school play a greater role in perceived health than relationships with teachers and peers.
- It is still a hypothesis that grading is causing mental health problems but no one has been able to dismiss it.

Papers published in connection with the research programme

- Evans, B. E., Kim, Y., & Hagquist, C. (2020) Classroom disorder and internalizing problems among Swedish adolescents: Changes between 1988 and 2011. *Journal of School Health*, 90(7), 554-563. doi.org/10.1111/josh.12904. Open Access.
- Giota, G., & Gustafsson, J.E. (2020). Perceived Academic Demands, Peer and Teacher Relationships, Stress, Anxiety and Mental Health: Changes from Grade 6 to 9 as a Function of Gender and Cognitive Ability. *Scandinavian Journal of Educational Research*. doi.org/10.1080/00313831.2020.1788144. Open Access.
- Högberg, B., Strandh, M., & Hagquist, C. (2020). Gender and secular trends in adolescent mental health over 24 years – The role of school-related stress, *Social Science & Medicine*, 250:112890. doi.org/10.1016/j.socscimed.2020.112890. Open Access.
- Högberg, B., Lindgren, J., Johansson, K., Strandh, M., Petersen, S. (2019). Consequences of school grading systems on adolescent health. *Journal of Education Policy*. doi.10.1080/02680939.2019.1686540. Open Access.
- Nygren, K., & Hagquist, C. (2019). Self-reported school demands and psychosomatic problems among adolescents – changes in the association between 1988 and 2011? *Scandinavian Journal of Public Health*, 47(2), 174-181. doi:10.1177/1403494817725687. Open Access.
- Giota, J., & Gustafsson, J. - E. (2016). Perceived demands of schooling, stress and mental health: Changes from grade 6 to grade 9 as a function of gender and cognitive ability. *Stress and Health*, 1-14. doi:10.1002/smi.2693.

TRENDS GENERAL

Papers published in connection with the research programme

- Evans, B. E., Kim, Y., & Hagquist, C. (2020). A latent class analysis of changes in adolescent substance use between 1988 and 2011 in Sweden: Associations with sex and psychosomatic problems. *Addiction*. doi.org/10.1111/add.15040. Open Access.
- Kim, Y., Evans, B. E., & Hagquist, C. (2020) Mental health problems among adolescents in Sweden from 1995 to 2011: The role of immigrant status and the proportions of immigrant adolescents in their surrounding community. *Journal of Immigrant and Minority Health*. 22, 232–239. doi.org/10.1007/s10903-019-00951-0. Open Access.
- Giota, J., Bergh, D., & Emanuelsson, I. (2019). Changes in individualized teaching practices in municipal and independent schools 2003, 2008 and 2014 - student achievement, family background and school choice in Sweden. *Nordic Journal of Studies in Educational Policy*, 5(2), 78-91. doi:10.1080/20020317.2019.1586513. Open access.

- Hagquist, C., Due, P., Torsheim, T., & Välimaa, R. (2019). Cross-country comparisons of trends in adolescent psychosomatic symptoms – A Rasch analysis of HBSC data from four Nordic countries. *Health and Quality of Life Outcomes*, 17:27, doi:10.1186/s12955-019-1097-x. Open Access.
- Johansson, K., Petersen, K., Högberg, B., Stevens, G., De Clercq, B., Frاسquilho, D., Elgar, F. & Strandh, M. (2019). The interplay between national and parental unemployment in relation to adolescent life satisfaction in 27 countries: analyses of repeated cross-sectional school surveys, *BMC Public Health*. 19:1555, <https://doi.org/10.1186/s12889-019-7721-1>.
- Kim, Y., Evans, B. E., & Hagquist, C. (2019). Towards explaining time trends in adolescents' alcohol use: A multilevel analysis of Swedish data from 1988 to 2011. *European Journal of Public Health*, 29(4), 729-735. doi:10.1093/eurpub/ckz023. Open Access.
- Bortes, C., Strandh, M., & Nilsson, K. (2018). Health problems during childhood and school achievement: Exploring associations between hospitalization exposures, gender, timing, and compulsory school grades. *PloS One*, 13(12). doi:10.1371/journal.pone.0208116. Open Access
- Högberg, B., Strandh, M., Petersen, S. & Johansson, K. (2018). "Education system stratification and health complaints among school-aged children", *Social Science & Medicine*, 220, 159-166. doi:10.1016/j.socscimed.2018.11.007
- Norell-Clarke, A., & Hagquist, C. (2017). Changes in sleep habits between 1985 and 2013 among children and adolescents in Sweden. *Scandinavian Journal of Public Health*, 45(8), 869-877. doi:10.1177/1403494817732269
- van Geelen, S. M., & Hagquist, C. (2016). Are the time trends in adolescent psychosomatic problems related to functional impairment in daily life? A 23-year study among 20,000 15-16 year olds in Sweden. *Journal of Psychosomatic Research*, 87, 50-56. doi:10.1016/j.jpsychores.2016.06.003

SCHOOL

Papers published in connection with the research programme

- Bergh, D., & Giota, J. (2020). Student achievement goals and psychosomatic health complaints among Swedish adolescents: the role of sex. *Journal of Public Health: From Theory to Practice*. doi.org/10.1007/s10389-020-01374-0. Open Access.
- Bortes, C., Strandh, M. & Nilsson, K. (2020). Parental Illness and Young People's Education, *Child Indicators Research*, 13:2069–2091, <https://doi.org/10.1007/s12187-020-09731-x>
- Bortes, C., Strandh, M. and Nilsson, K. (2020). Sibling Ill-Health and Children's Educational Outcomes, *Journal of School Health*, 90(5), 407-414. doi.org/10.1111/josh.12887. Open Access.
- Giota, J., & Bergh, D. (2020). Adolescent Academic, Social and Future Achievement Goal Orientations: Implications for Achievement by Gender and Parental Education. *Scandinavian Journal of Educational Research*. doi: 10.1080/00313831.2020.1755360. Open Access.

- Persson, L. & Hagquist, C. (2020). Improvements in the school environment - Results of a Swedish Health School Project. *International journal of Health Promotion*, 1-11, <https://doi.org/10.1093/heapro/daaa130>.
- Vaezghasemi, M., Mosquera, P., Gustafsson, P., Nilsson, K. & Strandh, M. (2020) "Decomposition of income-related inequality in upper secondary school completion in Sweden by mental health, family conditions and contextual characteristics", accepted for publication by *SSM - Population Health*.
- Bortes, C., Strandh, M., & Nilsson, K. (2019). Is the effect of ill health on school achievement among Swedish adolescents gendered? *SSM - Population Health*, 8, 100408. doi:10.1016/j.ssmph.2019.100408. Open Access.
- Brännlund, A., Strandh, M., & Nilsson, K. (2017). Mental-health and educational achievement: the link between poor mental-health and upper secondary school completion and grades in Sweden. *Journal of Mental Health*, 26(4), 318-325. doi.org/10.1080/09638237.2017.1294739.
- Persson, L., & Svensson, M., (2017). Classmate characteristics, class composition and children's perceived classroom climate. *Journal of Public Health*, 25, 473-480. doi:10.1007/s10389-017-0809-0. Open Access.

FAMILY

Major conclusions

- There is no evidence that changes in the family structure explains the trend of increasing mental health problems among adolescents.

Papers published in connection with the research programme

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RESEARCH ENVIRONMENT

In accordance with the purpose of the programme grant “...to reinforce and expand research environments in a long-term perspective”, efforts to increase the capacity and the competence of the research group have guided the programme work since the very beginning. Recruitment of post-doctoral fellows has been prioritised. The postdoc positions were advertised internationally, and most of the postdocs employed had experiences of international research, either as post docs or as doctoral students.

Since the programme start, a total of seven post docs have been working within the programme. Most postdocs had an academic background in psychology, a few in social work and sociological demography. In order to achieve a sustainable research environment, efforts were made to extend the two-year postdoc periods. These efforts were hampered by legal formalities that do not allow extensions of a postdoc and by the leadership of the faculty who did not approve to advertising of permanent positions.

In Appendix 3, the members of the research teams at CFBUPH and at the Department of Education and Special Education at the University of Gothenburg are listed.



Four postdocs at CFBUPH. From the left. Yunhwan Kim from South Korea, PhD Ohio State University USA; Jani Turunen from Sweden, PhD Stockholm University; Brittany Evans from the USA, PhD VU University Amsterdam, the Netherlands and Li Ma from China, PhD Stockholm University.

FUNDING

The expansion of the research group is made possible not just by the Forte grant (12 000 000 SEK) but also by additional funding from other external sources than state research agencies, e.g. the County Council of Värmland, the Inland Norway University of Applied Sciences, the National Board of Health and Welfare and by internal funding from the Faculty of Arts and Social Sciences at Karlstad University. In Appendix 4 details about the funding sources in addition to the Forte grant are shown. The total sum of these funds is SEK 11 030 368.

In parallel to applying for external grants, CFBUPH has in 2013 and 2015 applied for status as a strong research group at Karlstad University. Both applications were rejected. Applications for national programme grants were also submitted, without being approved.

The Swedish Research Council approved in 2017 an application for long-term funding of the ETF database structure based on an application submitted by the University of Gothenburg with Karlstad University and the Institute for Evaluation of Labour Market and Education Policy (IFAU) as collaborative partners. During the initiation process the formal regulations were changed implying that CFBUPH and IFAU became represented in a steering group but not formal and funding parts of the project.

RESEARCH EXCHANGE INTERNATIONALLY

In addition to individual researchers' exchange and participation at international conferences, the Advisory Board meetings, and the recruitment of international post docs, strong efforts have been made to expand the international exchange. In May 2017 CFBUPH hosted the sixth annual meeting of the European Rasch Training Group (ERTG).

During the last few years the collaboration within the Nordic countries has been elaborated, partly as an extension of the HBSC-collaboration.



Participants at the ERTG meeting in Karlstad 2017.

PHD TRAINING

During the programme period, four doctoral students at CFBUPH have completed their PhDs, all of them in Public Health:

- Annette Løvheim Kleppang, *“Mental health and physical activity in adolescence”*, 14 September 2018.
- Louise Persson. *“Health Promotion in Schools: Results of a Swedish Public Health Project”*, 13 May 2016.
- Lisa Hellström. *“Measuring Peer Victimization and School Leadership: A study of definitions, measurement methods and associations with psychosomatic health”*, 27 March 2015.
- Linda Beckman. *“Traditional Bullying and Cyberbullying among Swedish Adolescents. Gender differences and associations with mental health”*, 27 September 2013.

Victoria Lönnfjord is a doctoral student in Social Work and scheduled to defend her thesis in 2021.



Linda Beckman, Louise Persson and Lisa Hellström



Annette Løvheim Kleppang



Victoria Lönnfjord

DISSEMINATION OF KNOWLEDGE OUTSIDE THE SCIENTIFIC COMMUNITY

During the programme period, the results from the programme have been shared with the public in different ways:

- Seminars for stakeholders and public meetings.



The governor of Värmland Kenneth Johansson talking at a public meeting on child and adolescent mental health. Photo: Öivind Lund

- In May 2013, CFBUPH organised a public meeting on child and adolescent mental health. The governor of Värmland gave a talk and board members of the CFBUPH presented their research. The audience were students, university staff and stakeholders, a total of about 150 people.
- Participation at a seminar during the Almedalen Week 2014, which is considered to be the most important forum in Swedish politics. The seminar was about School achievement and Mental Health, organised by the Nordic Centre for Welfare and Social Issues and the Nordic Council of Ministers.
- An important communication channel for the programme is CFBUPH:s website, www.kau.se/cfbuph. The target groups are researchers, collaborative partners and the surrounding community. The site is also available in an English version: www.kau.se/en/cfbuph.
- Participation in media (e.g. BBC Radio 4, “The Borders of Sanity” (9 June 2016) and the Swedish TV programme “Vetenskapens värld” (The World of Science), SVT2 (23 April 2018).



Curt Hagquist (in the middle), appeared in a radio programme on the BBC (Channel 4) on June 6, 2016 about young people's mental health in Sweden. To the left producer Keith Moore and to the right reporter Christopher Harding from the BBC.



Curt Hagquist (to the left), together with the team from SVT during the filming of Vetenskapens värld.

Ministerial meetings

In May 2019, the Swedish Minister for Health and Social Affairs Lena Hallengren visited CFBUPH. The discussion covered, among other things, the importance of resuming important national studies in the field and improving knowledge transfer between academia and society.

As a result of the May visit, the Minister for Health and Social Affairs called for a round-table discussion in November with experts and researchers to discuss what can be done to increase understanding of the causes of the rise in mental health problems among adolescents, and what preventive measures are effective.



Minister for Health and Social Affairs, Lena Hallengren (S), in conversation with Professor Curt Hagquist, in connection with her visit to CFBUPH on 9 May 2019. Photo: Peter Bäcker



Participants at the round-table discussion on 20 November 2019. From left: Curt Hagquist, CFBUPH, Peter Friberg, University of Gothenburg, Lena Hallengren, Minister for Health and Social Affairs, Anna Sarkadi, Uppsala University, Peter Salmi, the Swedish National Board of Health and Welfare, Ing-Marie Wieselgren, the Swedish Association of Local Authorities and Regions, and Christina Dalman, Karolinska Institutet.

Conference for the tenth anniversary of CFBUPH, 11 June 2019

To celebrate the tenth anniversary of CFBUPH, a conference was held on 11 June, open to anyone working with or interested in the mental health of children and adolescents. The conference brought together 150 participants – researchers, politicians, professionals within social services, health care and schools, as well as other interested parties.

Leading researchers from Australia, Canada and the UK gave lectures, and researchers from CFBUPH and the University of Gothenburg presented results from the Forte-funded research programme on the effects of changes in living conditions on the mental health of children and adolescents. During the evening, local politicians participated in a panel discussion on how to prevent mental health problems in adolescents. Most members of the audience were from Värmland, but there were also many from Umeå, Stockholm, Örebro and other places in the country, as well as from Norway.



Panel discussion: What should be done to prevent mental health problems among adolescents? From left: Elisabeth Kihlström, Regional Commissioner (KD), Region Värmland, Linda Larsson, Municipal Commissioner (S), Karlstad Municipality, Ing-Marie Wieselgren, Coordinator for Mental Health, the Swedish Association of Local Authorities and Regions. Moderator: Professor Arne Holte, University of Oslo. Photo: Lennart Fernqvist.



Panel discussion during CFBUPH's 10th anniversary with fellow scientists from Canada, Australia, the UK and Sweden. From left: Doug Willms, Steve Zubrick, Candace Currie, Magdalena Janus, Jan-Eric Gustafsson, Curt Hagquist and moderator Erland Hjelmqvist, chairman of the board of CFBUPH.

On 14 February 2019, the Forum Värmland conference was organised by Region Värmland and Karlstad University. New research in the field of health care was presented. The lectures were shown on the Swedish educational and documentary TV channel, Kunskapskanalen (the Knowledge Channel). Curt Hagquist participated and talked about the consequences of mental health problems in adolescents.

SUMMARY AND CONCLUSIONS

Studies using self-reported data, along with national health register data, clearly indicate an increase of mental health problems among young people in Sweden since the 1980s. In parallel, profound societal changes have taken place in Sweden, in the family structure, the school system, the labour market and in other sectors. The population structure among the younger age cohorts has also changed due to migration. The development of the information technology including the smart phones also marks a significant change of the growing up conditions for young people.

To what extent and in what ways these societal changes have affected child and adolescent mental health is still not sufficiently investigated. Hence, it has proven difficult to find causes of changes in adolescent mental health over time.

In order to study whether changes in different social conditions can explain the increase, interdisciplinary research between public health science and educational science has been conducted by researchers at the universities of Karlstad and Gothenburg. The research has been carried out between 2013 and 2020, mainly funded with grants from Forte, the Swedish Research Council for Health, Working Life and Welfare. The research programme *The impacts of changed living conditions on child and adolescent mental health* has generated new insights. The purpose of the programme was to study how societal changes affect the mental health of children and adolescents following two main tracks: the school environment and economic conditions at the individual and societal levels. Researchers at the Centre for Research on Child and Adolescent Mental Health (CFBUPH) at Karlstad University have mainly investigated the economic and socio-economic conditions while researchers at the Department of Education and Special Education at the University of Gothenburg have focused on the school environment. During the programme period, almost 70 papers have been published in scientific journals (appendix 1). An overall assessment of what has been published points to that there are more than one reason behind the deteriorated mental health among adolescents in Sweden and that the principal explanations probably vary over time in line with societal changes. In this report, the focus is on economic stress (1990s) and school stress (last decades) as explanatory factors of the increase of mental health problems among young people. In addition, although the focus of the research programme has been on conditions in Sweden, some potential causes need to be sought among globally changes such as the dramatic increase of electronic media use during the last decades.

Economic stress

Studies conducted within the Forte research programme show that mental health problems among adolescents in Sweden is strongly associated with economic stress. Two of the studies were based on regional repeated cross-sectional data covering two decades and one study was cross-sectional targeting the entire population of adolescents in two age groups. All three studies clearly point to the crucial role of economic stress for the understanding of variations in adolescent mental health. One of the trend studies shows that when the effect of worry about the family's finances was eliminated from the analyses, the entire trend pattern changed and the increase in psychosomatic problems disappeared or was

even reversed into a decline (Kim & Hagquist, 2018b). By synthesising the results from this study with a couple of other Swedish studies (Hagquist, 2016; Kim & Hagquist, 2018a), a solid circumstantial chain is formed which indicates that the deteriorated mental health during the 1990's among young people in Sweden was most likely caused by increasing economic stress. These relatively conclusive results regarding the impacts of economic stress are also highly relevant in the light of the current Covid-19 pandemic (Hagquist & Gustafsson, 2020). While young people have been less affected by the current pandemic in terms of number of deaths and cared for at hospitals, changes of economic and social conditions may severely affect young people largely. As with the 1990s economic crisis in Sweden, adolescents' mental health may deteriorate because of economic stress and because it will be harder for them to get work and their parents may become unemployed. Hence, the negative trend of young people's mental health may be intensified.

School stress

Two of the studies in the Forte programme focusing on school, learning and mental health were based on longitudinal data collected through national cohort survey, in which students born in 1998 in school years 6 and 9 have answered questions about stress, perceived demands in school and psychosomatic symptoms (Giota & Gustafsson, 2016; 2020). Students in the current sample received grades in school year 9 but not in school year 6. Experiences of school stress is the major focus of both papers. Students who struggle with schoolwork feel greater stress. There are differences between boys and girls already apparent in school year 6 but they are not so great. Between school years 6 and 9, stress increases sharply and the gender differences in stress grow bigger. The girls experience the worst stress. The analyses show strong associations between the perceived level of demands in school, increased stress and mental health problems. Boys experience school demands less than girls, and the boys self-rated stress level is also lower. The crucial role of school demands is clearly confirmed by results showing that, after statistical control for perceived school demands and stress, there are no longer any gender differences in psychosomatic symptoms by the time the children reach school year 9.

The students' relationships with teachers and peers were also found to have an impact on changes in perceived stress and mental health problems, but the demands in school play a greater role in perceived health. Preliminary analyses, not published yet, show that coping with school demands as well as school satisfaction have deteriorated sharply in school year 6 after grades were introduced.

Two other studies conducted at Umeå University, in which researchers from the Forte programme participated, points in the same direction. A trend analysis over 24 years showed that school stress explained a significant proportion of the increase in psychosomatic symptoms among girls, but only a small proportion of the increase among boys (Högberg, Strandh & Hagquist, 2020). Another study showed that school stress and psychosomatic symptoms increased in the wake of the introduction of the 2011 curriculum, which involved more grading and tests in schools (Högberg, Lindgren, Johansson, Strandh & Petersen, 2019). That study also found that the negative effects were stronger for girls than for boys.

The family situation

In addition to economic conditions and school stress also some other potential explanatory factors of changes in adolescents' mental health have been studied in the Forte programme. An increased number of separations between parents has sometimes been put forward as a possible cause of the increased mental health problems among children. However, there is no evidence that changes in the family structure are behind this trend. In a long-term perspective, the proportion of children living with both their parents has decreased, but only small changes have taken place during the 2000s. At the same time, joint physically custody and alternating residency for the children have become more common. Our studies also show that there are only small, if any, differences in mental health between children living in alternating residency and those living with both their parents of origin (Hagquist, 2016; Turunen, 2017).

Electronic media use

Another hypothesis, which, as yet, can neither be confirmed nor rejected, is that the use of smartphones has caused the increased mental health problems among adolescents. Electronic media and, in particular smartphones, have fundamentally changed the society. Information technology has opened up new opportunities but has also created new problems. The associations between electronic media use and mental health are difficult to interpret. It seems too early to say whether there is a causal link, because an alternative explanation may be that children who are mentally ill tend to use social media more than others do.

Methodology

Most of the methodological work conducted concerns instrument analyses based on Rasch Measurement Theory. A particular focus is on Differential Item Functioning (DIF), e.g. if, or to what extent, the mental health scales work invariantly across time, genders and countries. The DIF analyses also focus on the causes of the DIF and how DIF can be accounted for. Another methodological field is about validating non-response calibration weights through panel data.

Strengths and weaknesses of the research

Most of the studies published in the programme work are based on data from three large longitudinal studies, two of them with repeated cross-sectional design and one with sequential cohort design. While it would have been desirable with a broader range of outcome variables on mental health problems, in most of the major analyses, psychosomatic problems have been used, because that is the measure of mental health problems available in the longitudinal studies used in the programme work. Moreover, measures based on multiple items are usually preferable to single item measures because they increase both the reliability and validity of measurement. While the outcome measures were constructed by several items, some of the predictor variables were single item measures.

The access to beforementioned data has been decisive for the analyses of time trends and determinants of young people's mental health in Sweden. In particular, the available

data have been useful for analyses of social, economic and educational determinants. In addition, many psychometric studies based on Rasch Measurement Theory have been carried out within the framework of the programme, in order to examine the quality of the outcome measures used. Unfortunately, the data available in the research programme did not enable thorough studies of the health impacts of the more recent development of electronic media use among children and adolescents and we failed to initiate new data collections addressing that issue.

Looking for societal causes of changes in mental health is a challenge. Based on our research we are able to present strong empirical indications of some factors that most likely have contributed to the deteriorated mental health among young people in Sweden, although we cannot offer firm causal explanations in a strict sense.

Collaboration and infrastructure

A distinctive purpose of the programme grant that was emphasised by Forte was to “reinforce and expand research environments in a long-term perspective.” In addition, Forte stated that “Close collaboration or contacts with prominent researchers, within Sweden and internationally, is valuable.” Already at the stage of preparing the grant application, efforts were made to properly respond to both of these requirements. Close collaboration between researchers at Karlstad University and the University of Gothenburg has been an integral part of the programme work. Similarly, an International Advisory Board, including prominent researchers from Australia, Canada, Great Britain and Germany, has been connected to the programme to provide advice and support. The meetings with the Advisory Board have been held each year or every second year.

The progress and success of the research programme was clearly manifested at CFBUPH:s 10th anniversary conference in June 2019. The conference brought together 150 participants – researchers, politicians, and professionals within social services, health care and schools, as well as other interested parties. Members of the Advisory Board from Australia, Canada and the UK gave lectures, and researchers from CFBUPH and the University of Gothenburg presented results from the Forte-funded research programme (appendix 2). In addition, local politicians participated in a panel discussion on how to prevent mental health problems in adolescents.

The programme work has been successful in developing a solid research environment that has attracted well-qualified younger researchers as well as additional funding outside the programme. In total the programme has received an extra 11 million SEK in funding, in addition to the 12 million SEK from Forte (appendix 4). This has enabled recruitments of highly competent post-doctoral researchers with broad international experiences. One major limitation has been that the appointments have been temporary positions. CFBUPH has raised this problem repeatedly with the faculty management and has requested that permanent positions as senior lectures be advertised. Unfortunately, these requests were not supported by the faculty management. One consequence of this was that the number of researchers at CFBUPH decreased as postdoc appointments ended.

Future directions

What has been achieved in the Forte programme comprises a sound ground for a continuation and elaboration of the research on young people's mental health with a long-term perspective.

The interdisciplinary collaboration between researchers of public health science and educational science will continue in the coming years, with the University of Gothenburg as an organisational platform. The Principal Investigator of the Forte programme, Professor Curt Hagquist, has stepped down as director of CFBUPH at Karlstad University and is for the next few years employed as guest professor of public health at the University of Gothenburg, department of Education and Special Education. In his new position, Hagquist will intensify his collaboration with Professor Jan-Eric Gustafsson in research on school, learning and mental health. New interdisciplinary collaborative studies await. Funding has been received from the Sten A Olsson Foundation for a four-year study on school, learning and mental health. Moreover, another study is underway, about experiences and consequences of the corona pandemic among 16-year-olds in Sweden.

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APPENDIXES

Appendix 1: Complete list of publications

2020

- Bergh, D., & Giota, J. (2020). Student achievement goals and psychosomatic health complaints among Swedish adolescents: the role of sex. *Journal of Public Health: From Theory to Practice*. doi.org/10.1007/s10389-020-01374-0. Open Access.
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Appendix 2: Presentations of the research programme at CFBUPH anniversary conference 11 June 2019

- Bergh, D. Student Goal Orientations, School Achievement, and PsychoSomatic Problems – Are the findings similar for boys and girls?
- Evans, B. Changes in patterns of adolescent substance use between 1988 and 2011 in Sweden: Associations with gender and internalizing problems
- Giota, J. Perceived demands of schooling, stress and mental health
- Gustafsson, J-E. Perceived demands of schooling, relations with peers and teachers, and mental health
- Hagquist, C. Presentation of the research programme and future challenges
- Kim, Y. Trends in adolescent mental health during economic upturns and downturns: A multilevel analysis of Swedish data 1988–2008
- Ma, L. Leisure time physical activity and depressive symptoms among adolescents in Sweden
- Norell Clarke, A. Swedish Adolescents' sleep: habits and health
- Strandh, M. School grading, stress and health among adolescents: Evidence from a Swedish school reform
- Turunen, J. Custody form and children's sleep habits

Appendix 3: Participating researchers

CFBUPH, Karlstad University

- Curt Hagquist, professor, Principal Investigator, 2013-2020
- Daniel Bergh, senior lecturer, 2013-2019
- Annika Norell Clarke, post doc, 2015-2017
- Yunhwan Kim, post doc, 2016-2020
- Jani Turunen, post doc, 2016-2018
- Brittany Evans, post doc, 2017- 2019
- Li Ma, post doc, 2017-2019
- Mattias Strandh, professor, 2015-2020
- Karina Nygren, post doc, 2014-2015
- Stefan van Geelen, post doc, 2014-2015
- Nanette Danielsson, post doc, 2014-2015
- Per-Anders Rydelius, professor, 2013-2015

Department of Education and Special Education, University of Gothenburg

- Jan-Eric Gustafsson, professor, 2013-2020
- Joanna Giota, professor, 2013-2019
- Alli Klapp, docent, 2018-2019
- Michael Hansen, data manager, 2013-2019
- Bo Nielsen, data manager, 2013-2019

Appendix 4: Funding sources in addition to the Forte grant

Funding source	Project	2014	2015	2016	2017–2019
County council of Värmland	Alcohol use and adolescent mental health	270 000			
Kempe Carlgren Foundation	Measuring students' skills in math		450 000		
Swedish Research Council via University of Gothenburg	Individualised teaching, motivation, achievement, mental health among students			458 348	336 042
County Council of Värmland	Variations between municipalities and schools in adolescents' alcohol consumption			277 000	
Inland Norway University of Applied Sciences	Postdoc, 2 years			2 232 185	
Faculty of Arts and Social Sciences, Karlstad University	Postdoc, 2 years			2 189 000	
National Board of Health and Welfare	Impacts on every-day life of Mental health problems among young people				1 900 000
Public Health Agency of Sweden	Impacts on every-day life of mental health problems among adolescents – a literature review				654 947
County Council of Värmland	Protective factors for mental health problems among young people				2 262 846

