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# Gender, health, the decisions we make and the actions we take

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# Gender, health, the decisions we make and the actions we take

Devon Spika

Lund Economic Studies
Number 238

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Gender, health, the decisions we make and the actions we take

# Gender, health, the decisions we make and the actions we take

by Devon Spika

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Gender, health, the decisions we make and the actions we take:

Abstract

This thesis comprises of four self-contained papers that use both experimental and applied micro-econometric methods to explore different aspects of gender, health, the decisions we make, and the actions we take.

In the first paper we investigate changes in psychiatric diagnoses and their income-related inequalities over time in Sweden and attempt to disentangle the development by decomposing changes over time in terms of population-level changes in education and migration background. Using Swedish administrative data we find that income-related inequalities in mental ill health increased dramatically between 1994 and 2011, but changes in education and migration background were not important drivers of these increases.

The second paper aims to improve our understanding of the use of commitment contracts to help individuals achieve their physical activity goals. We experimentally compare the success of commitment contracts with and without financial stakes attached, and find a significant positive impact of being offered a hard contract. Importantly, we find that the effects are strongest among participants who reported exercising the least at baseline.

In the third paper we seek to establish the effect of access to universal primary school-based health services in Sweden on long-term health and socioeconomic outcomes, using historical data on the timing of implementation of school health services in school districts in Sweden combined with administrative data. This paper helps shed light on the importance of interventions occurring during childhood on later life outcomes. Overall, we find little evidence that access to universal primary school-based health services leads to improved outcomes either during school ages or in later life.

In the fourth paper, I conduct a pilot study to experimentally investigate the role of children's books in the early internalisation of norms regarding gender, family, and careers. The motivation for this study was the fact that when women have children, they tend to make labour market decisions that result in substantial and persistent losses in earnings. The study was under-powered to draw strong conclusions, but results suggest exposure to a book that communicates a strong, positive message about mothers in both career and family roles may lead to reductions in implicit and explicit biases about gender, family and careers.

Key words

Gender, Health, Education, Inequality, Human Capital, Field Experiment, Gym attendance, Incentives, Commitment contract, Self-control, Books, Norms, Stereotypes, Children, Sweden, Mental health, Concentration index, RIF-regression, Oaxaca-Blinder Decomposition

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# Gender, health, the decisions we make and the actions we take

Devon Spika

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*For my brothers,*
*Jesse and Michael*

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# Abstract

This thesis comprises of four self-contained papers that use both experimental and applied micro-econometric methods to explore different aspects of gender, health, the decisions we make, and the actions we take.

In the first paper we investigate changes in psychiatric diagnoses and their income-related inequalities over time in Sweden and attempt to disentangle the development by decomposing changes over time in terms of population-level changes in education and migration background. Using Swedish administrative data we find that income-related inequalities in mental ill health increased dramatically between 1994 and 2011, but changes in education and migration background were not important drivers of these increases.

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In the third paper we seek to establish the effect of access to universal primary school-based health services in Sweden on long-term health and socioeconomic outcomes, using historical data on the timing of implementation of school health services in school districts in Sweden combined with administrative data. This paper helps shed light on the importance of interventions occurring during childhood on later life outcomes. Overall, we find little evidence that access to universal primary school-based health services leads to improved outcomes either during school ages or in later life.

In the fourth paper, I conduct a pilot study to experimentally investigate

the role of children's books in the early internalisation of norms regarding gender, family, and careers. The motivation for this study was the fact that when women have children, they tend to make labour market decisions that result in substantial and persistent losses in earnings. The study was under-powered to draw strong conclusions, but results suggest exposure to a book that communicates a strong, positive message about mothers in both career and family roles may lead to reductions in implicit and explicit biases about gender, family and careers.

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*'To dare is to lose one's footing momentarily.*
*Not to dare is to lose oneself.'*
– Søren Kierkegaard

My word for 2023 is 'dare'. Whilst some may see me as a rather daring individual already – I do indeed live across the world from my family and have travelled to some neat places – to me this word encompassed what I felt I needed to do to finish this PhD. I needed to dare to let go of my imperfections. Dare to let go of my feelings of being an impostor. Dare to let go of a paper when it was (hopefully) good enough.

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Some of you know that I skied the 90km Vasaloppet this year, amidst the intensity of getting papers finished for the thesis. I had skied it before, but not since starting the PhD, and I would not have managed this feat without the organised trainings and support of my ski club Ski Team Skåne. To have people to train with and chat with gave my mind a break from obsessing over minute analytical details. And the Vasaloppet gave me a goal and a commitment to stick to, which is probably what kept me sane these past months. (So, Vasaloppet: Thank you for the 20% discount you offered to women to sign up – it definitely got me on board!)

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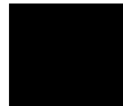
Lund, April 2023
*Devon*

# Introduction



# Introduction

Some may think of 'gender economics' and 'health economics' as distinct sub-fields of economics. But, gender and health pervade nearly all aspects of our lives and have an important interplay with more commonly thought of aspects of 'economics'.

Individuals who experience better health in childhood tend to have better later life outcomes. Children exposed to deworming treatment, for instance, complete more schooling, work more and earn more ten years later (Baird *et al.*, 2016), and individuals with better infant health are less likely to lose their jobs during macroeconomic crises (Bharadwaj *et al.*, 2019). Parents of healthier children may also invest more in their child's human capital (Adhvaryu & Nyshadham, 2016; Becker, 1960; Bhalotra *et al.*, 2022). Contemporaneous health may also affect economic outcomes, whereby individuals who experience worse health are more likely to transition out of the labour market and into disability (García-Gómez, 2011).

Gender schemas are learned from an early age and are also likely to have an important impact on outcomes. Already by age 5, gender differences in biases about math emerge (del Río *et al.*, 2019), and by age 6 girls are more likely to avoid games for "really, really smart" people and associate boys with being "really, really smart" (Bian *et al.*, 2017). In high school, girls do considerably worse on standardised tests compared to boys when exposed to math teachers with stronger gender stereotypes and pursue less demanding high school tracks (Carlana, 2019).

Gender and health are themselves intricately related, with boys and girls, men and women tending to react differently to (health) investments (see e.g. Miguel & Kremer, 2004; Pitt *et al.*, 2012) and suffer from different causes of ill health. Boys are more likely to be diagnosed with ADHD (Sayal *et al.*, 2018), and adult women experience more sickness absence than men (Mastekaasa & Melsom, 2014). Of note, women on average

also spend more than three times more time on unpaid care work than men (Charmes, 2019).

This thesis comprises of four self-contained papers covering different topics related to gender, health, the decisions we make, and the actions we take. A quest to better understand drivers of inequality underpins much of the research in this thesis, and I use both experimental and quasi-experimental methods to answer questions related to health behaviours, health outcomes, and gender norms and stereotypes. Different events throughout the life course may contribute differently to concurrent and later life outcomes and inequality. In this thesis, I study individuals at several points along the life course (preschool, primary school, adulthood) and the follow-up ranges from minutes, to months, to years.

## Health and health inequality

The first three papers in the thesis focus on topics related to health. An individual's health can have important consequences for the decisions they make and their contemporaneous and later-life outcomes. In turn, individual actions can also affect current and later-life health. Health endowments (Currie, 2009) and behaviours (Pampel *et al.*, 2010) moreover tend to differ along the income distribution, leading to important income-related inequalities in health.

In the first paper, my coauthors and I explore the extent of income-related inequality in psychiatric diagnoses in Sweden and the extent to which this inequality changed between 1994 and 2011. Mental ill-health has increased in Sweden over the past decades (Folkhälsomyndigheten, 2021), and is the main driver behind a trend in increased sickness absences in Sweden (Försäkringskassan, 2020). Understanding the development of income-related inequalities in mental health over time is important for the development of policies to mitigate the negative effects of mental ill-health. It is also important to understand whether the observed changes are due to changes in the composition of the population or to something else. This is especially important because a concentration of mental ill-health among certain groups could be leading to a cementing of inequality, which could persist over generations (Persson & Rossin-Slater, 2018). The evidence in

this paper is descriptive, rather than causal, but provides an important first step to understanding and tackling income-related inequalities in mental health in Sweden.

## Health and policy

Health inequalities may be due to differences in endowments, early life exposures and behaviours, among others. When developing policies to tackle (ill) health, policy-makers may choose a more targeted approach e.g. focusing on individual-level behaviour change, or take a more structural approach, e.g. by increasing access to primary healthcare in childhood.

In the second and third papers in this thesis, my coauthors and I evaluate the impact of two very different approaches to improving health (and broader societal outcomes). In the second paper, we conduct a field experiment to explore the use of a cheap and scalable intervention to get people to be more physically active. The intervention (commitment contracts) is conducted at the individual-level and is meant to help particularly those with low self-control achieve their physical activity goals. In the third paper, we use Swedish administrative data to investigate the long-run health and socioeconomic effects of the introduction of free, universal, primary school-based health services in Sweden in the 1940's. Sweden, with its encompassing set of universal policies targeting all individuals (in our case school children) provides a unique setting to assess the impact of policies covering large segments of the population, rather than targeting specific groups.

Both papers are related in that they evaluate the impact of health interventions, but differ in terms of the level at which the interventions are conducted and evaluated. In the second paper, participants were individually randomised to an offer of a commitment contract or not. This gives us, as researchers, a high degree of control when investigating the causal effect of the contract offer. Through random allocation of the treatments, we are able to identify the causal effect of commitment contracts, while abstracting from potential confounding variables.

As opposed to targeting individuals directly, the policy evaluated in the

third paper was universal, and we adopt a completely different approach to evaluate it. Exposure to primary school-based health services was not random. Rather, different school districts around the country introduced the services at different times over a period of less than ten years. Instead of assuming that exposure to school health services was 'as good as random', we make assumptions about the ways in which outcomes were evolving over time between exposed and unexposed cohorts within a school district. In this way, any deviations from the outcome evolution we would have expected in the absence of treatment can be attributed to the causal effect of school-based health services.

## The potential importance of early-life exposures

The fourth paper differs from the first three in that the topic of interest is gender. Specifically, I experimentally investigate the potential role of children's books in the early internalisation of gender norms regarding the career and family roles of mothers and fathers. This paper relates to the third paper in that it concerns the potential importance of early-life exposures and takes place in a (pre-) school setting. Schools offer a unique setting to implement interventions because they are where children and adolescents spend most of their days. Interventions carried out in schools can thus involve all children, not just those from particular socioeconomic groups or whose parents seek out treatment, which could serve to reduce inequalities in many domains (e.g. educational attainment, health, labour market aspirations and outcomes).

Investigating the long-run effects of early-life exposures takes patience, good data, and many years of follow-up. Indeed, the reform that we investigate in the third paper occurred over 70 years ago. This does not, however, mean that it is not interesting or important to study the short-run effects of such exposures. In the fourth paper, I explore how exposure to a given book immediately affects children's expectations about the career and family roles of mothers and fathers.

# Summary and contributions of the thesis

In what follows, I present a summary of each paper in the thesis and outline its contributions.

## Paper I: Education, immigration and rising mental health inequality in Sweden

The first paper charts how mental ill-health (measured in terms of inpatient psychiatric-related diagnoses) and income-related inequality therein has changed over time in Sweden. It is well established that education and income gradients in health exist (Conti *et al.*, 2010; Cutler & Lleras-Muney, 2006; Doorslaer & Koolman, 2004), but less is known about how these gradients have changed over time (Barr *et al.*, 2015; Hong *et al.*, 2011). From a policy perspective, it is important to understand how income-related inequalities in mental health change over time and what factors are associated with any observed changes.

Using administrative data on the Swedish population aged 31 to 64, we find that between 1994 and 2011 the probability of receiving a psychiatric inpatient diagnosis increased by 12.6%. Importantly, income-related inequalities increased by over 48%, and in 2011 over 50% of those with any psychiatric inpatient visit were concentrated among the poorest 20% of the population. Combining a recently-developed regression-based approach (Heckley *et al.*, 2016) with Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973) we investigate the extent to which population-level changes in educational attainment and immigration can explain the changes in inequality over time. Essentially, we ask what change in outcomes we would have expected if the associations between various predictors (in this case immigration background and education) and inequality would have stayed the same between the two time periods. Any diversion from that prediction is considered 'unexplained'. The decomposition analysis suggests that changes in immigration and education do not explain much of the increase in inequality.

The aim of this paper is not to dig into the causal relationship between education, immigration, and mental health (and income-related inequalit-

ies therein). Rather, it is to provide a first step to understanding trends in mental health over time and can be used to inform the development of policies to address both mental ill-health and investments in education. By applying the method of Heckley *et al.* (2016) we contribute to the literature by being the first to decompose changes over time in income-related inequalities in mental health measured using the Concentration Index. In doing so, we illustrate how Oaxaca–Blinder decomposition of changes in inequality can complement decomposition of changes in health, and have a similar interpretation.

## Paper II: Put a bet on it: Can self-funded commitment contracts curb fitness procrastination?

The second paper aims to improve our understanding of the use of commitment contracts to help individuals achieve their physical activity goals. Lack of physical activity carries important health and economic consequences related to, for instance, overweight and obesity (Organisation for Economic Cooperation and Development, 2019), human capital formation (Cappelen *et al.*, 2017; Fricke *et al.*, 2018) and memory (Erickson *et al.*, 2011; Roig *et al.*, 2013). Despite many people having intentions to be (more) physically active, only about 25% of adults around the world meet the World Health Organisation recommendations for physical activity (World Health Organization, n.d.).

An important challenge facing both individuals and policy-makers is *how* to get individuals to be more active. Identifying interventions that successfully increase physical activity and create lasting behaviour change is important. Developing our understanding of the demand for those interventions, how they should be structured, and who benefits most is also crucial.

Commitment contracts are a potentially highly scalable intervention that can help address problems of low self-control. They involve individuals making a pledge with themselves to achieve a particular goal, and imposing penalties on themselves if they don't reach it (Carrera *et al.*, 2022). The self-imposed penalties might be soft (an individual must live with the disappointment of not having met the contract terms) or hard

(the individual has attached stakes to the pledge and forfeits them if the contract terms are not met). Commitment contracts are effective in many domains (e.g., Himmler *et al.*, 2019; Schilbach, 2019) including for increasing or maintaining physical activity (Bhattacharya *et al.*, 2015; Carrera *et al.*, 2022; Royer *et al.*, 2015). It is not, however, clear yet to what extent the hard penalties or the contracts themselves drive any observed behaviour change. Moreover, hard commitment contracts may not always be welfare improving (Bai *et al.*, 2017; Carrera *et al.*, 2022; John, 2020). Understanding who demands commitment, and the extent to which hard versus soft commitment contracts are effective, is important.

With this in mind, we designed a field experiment to explore the effect of commitment contracts on physical activity, and the extent to which the effect of the contract differs by whether or not there is a hard penalty attached. We collaborated with a large gym chain and randomly assigned participants to an offer of no contract, a contract only, and a contract with the opportunity to add a hard financial penalty. We allowed participants to design their own contracts in terms of length and intensity, and observe their physical activity using information on gym visits.

We find that both soft and hard contracts increase visits to the gym, though individuals with a hard contract increased their visits more and were more likely to meet their contract targets. Thus, commitment contracts can be effective in increasing physical activity even among current gym goers, who may be generally healthier and already prioritise physical activity more than the general population.

By experimentally comparing the success of commitment contracts with and without financial stakes attached, we contribute to the literature on commitment contracts for behaviour change broadly, and for increasing physical activity specifically. The contracts in our experiment were, moreover, completely *self-funded*, using individuals' own money. We confirm that previous findings can be replicated when own money is at stake, which is useful because the costs associated with the intervention are minimal and it is thus highly scalable.

## Paper III: Early health investments and human capital formation: the long-term effects of school doctors in Sweden

The aim of the third paper is to establish the effect of access to universal primary school-based health services in Sweden on long-term health and socioeconomic outcomes. Specifically, we ask whether health investments targeting school children at ages 7 to 14 matter for later life outcomes.

The reform we study introduced state funding for universal, primary school-based health services. School doctors formed a central component of the reform and were responsible for e.g. regularly evaluating the children, teaching them about health living habits, and identifying children who might be in need of closer follow-up. School districts applied for this state funding, and once the programme was in place in a school district, all students were covered. Exposure to this reform was therefore not random.

To evaluate the long-term effects of access to school doctors, we adopt a quasi-experimental approach whereby we make use of the fact that different school districts introduced school doctors at different times. To get at the causal effect of school doctors on later life outcomes, we can therefore compare the outcomes, within school districts, among individuals who had already graduated from primary school when school doctors were introduced and younger individuals who were still in primary school when school doctors were introduced.

Using Swedish administrative data, we identify where individuals attended primary school (to determine exposure to school doctors) and link this to information on long-run health (hospitalisations and deaths) and socioeconomic outcomes (earnings, employment, educational attainment). We complement this with information on grades and absences for a subset of individuals on whom we have information on grade one and four schooling outcomes. Overall, we find little evidence of economically meaningful or statistically significant effects of access to school doctors on concurrent or later-life outcomes.

This paper helps to shed light on the importance of interventions occurring during childhood on later life outcomes. This is important because although several studies have established the effects of events occurring

in utero or early life (Almond *et al.*, 2018; Bhalotra *et al.*, 2022; Bütikofer *et al.*, 2019; Currie, 2020), few have sought to establish the effects of events during childhood, a potentially critical period of development, on later life outcomes. This is in part because of the difficulty in identifying exogenous changes that specifically target the health of children after the post-neonatal period. By using administrative data and information on a universal reform that targeted school-age children, we help fill this research gap.

In doing so, we also contribute knowledge about whether schools and the school age period are effective for interventions. Children spend most of their waking hours at school, and nearly all countries in the world mandate compulsory education.[1] This makes schools an ideal place to carry out public health interventions and surveillance. Despite this, few school-based interventions have been systematically evaluated, particularly universal ones.[2]

## Paper IV: Children's books and the early internalisation of gender norms – a pilot study

A Google News search for the words "books gender" returns 133,000 results. Many focus on court cases related to book bans in the United States, with several mentions of the controversial book 'Gender Queer'. Several others document (backlash against) the recent re-writing of several passages in Roald Dahl's books deemed insensitive with regards to e.g. gender, race and body weight. An important question is: why the stir? Why have books become such a topic for debate?

Books contain important messages about the world and are a vehicle

[1]Note that compulsory education does not always imply requirement to *attend* school.

[2]An important exception is the work of Abrahamsen *et al.* (2021), who investigate the effect of increased availability of school nurses in Norway in 1999 on short- and medium-run outcomes. Moreover, many small-scale, targeted health interventions have been carried out and evaluated within schools and the school domain – for instance trials and interventions focusing on diet intake, physical activity, mental health, drug prevention and sexual health (Denford *et al.*, 2015; Kriemler *et al.*, 2011; Shackleton *et al.*, 2016).

for communicating about things that are deemed good and bad and how people should behave. Recent evidence highlights differences in the representation of male and female characters, individuals of different races, and adults versus children in popular children's books (Adukia *et al.*, 2021, 2022; Lewis *et al.*, 2022). The lack of representation of certain groups may lead to individuals who do not conform to the social norm feeling that they do not belong. Moreover, because characters in books may act as role models, only showing individuals of particular groups doing certain things and not others may limit the potential opportunities children see for themselves.

Individuals concerned with books like 'Gender Queer' tend to express worry that such books might give children ideas that they would not otherwise have had. This concern highlights the potential power of books in influencing individuals' decisions and behaviours. Despite these highly publicised concerns, there is a dearth of causal evidence on the role of children's books in shaping, in particular, implicitly held gender stereotypes (Block *et al.*, 2022; Pruden & Abad, 2013).

In this paper, I seek to contribute evidence on this important topic. In particular, I am concerned with the role of books in shaping internalised norms and stereotypes about the career versus family roles of mothers and fathers. Understanding the importance of books in shaping these is crucial because if children are internalising these norms from a young age, they might make different decisions about, for instance, human capital investments. They might also change the way they work once they have children. Both of these could be contributing to observed differences in labour market outcomes between men and women once they have children (see e.g. Kleven *et al.*, 2019a,b).

To investigate the role of children's books in the internalisation of gender norms, I designed and ran a pilot experiment where children were randomly assigned to view the reading of a book that communicates a strong, positive message about mothers in both career and family roles, or a book with no message about gender, family or careers. I estimate the effect of exposure to the treatment book on internalised norms by measuring both implicit and explicit biases about gender, family and career roles held by the children after the book reading. Implicit biases can be thought

of as those biases (stereotypes or attitudes) that are acquired passively without an individual's conscious knowledge, and of which an individual need not be aware (Dasgupta, 2013). Explicit biases, in contrast, are beliefs or attitudes of which an individual is aware. While people tend to think of their (explicit) biases as individual and distinct from others, their implicit biases will tend to reflect the social hierarchies in place and be similar to those of other members of their society (Dasgupta, 2013).

The aim of this pilot study was primarily to test the experimental procedures, investigate children's responses to the treatment books, and assess the extent to which participating children held implicit and explicit biases about the roles of mothers and fathers. Overall, children responded positively to both the treatment and control books and the vast majority engaged well with the tasks. Due to the low statistical power of the study, I am unable to draw strong conclusions, but all point estimates suggest that the treatment book reduces both implicit and explicit biases.

With this pilot study and a future larger-scale intervention, I aim to contribute evidence on the presence and malleability of biases held about the roles of mothers and fathers at a young age. Specifically, I hope to provide causal evidence on the effect of books on the internalisation of said biases. This is relevant because stereotypes formed and internalised in childhood are likely to have an important impact on those held in adulthood, and these in turn may have important implications for economic outcomes. Books are just one of many mediums through which children learn about the world, and understanding the extent of their role is important.

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