



The Swedish Generations and Gender Survey 2021: Forerunner of new modules for the Generations and Gender Programme

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Abstract

The Swedish Generations and Gender Survey 2021 (GGS2021) was the second GGS that Sweden carried out. It was a web-based survey with a paper-based option. Like the first GGS in Sweden (GGS2012) it was linked to register data that cover key dimensions of respondents' life courses. The Swedish GGS2021 contains two new modules implemented to further research on the link between subjective perceptions and fertility. Both modules will be part of the second wave of the international GGS standard questionnaire. In this contribution, we first describe our motivation to carry out the Swedish GGS2021. We then present our two new modules and sketch their theoretical underpinnings. This is followed by a summary of the data collection process and an assessment of data quality. We conclude with some reflections on the implementation of new modules in future international GGSs and on our experience with register-linked surveys.

Keywords: Generations and Gender Survey; Generations and Gender Programme; Sweden; Global uncertainties; Intensive parenting

Introduction

The Swedish Generations and Gender Survey 2021 (GGS2021) was the second GGS that Sweden carried out within the Generations and Gender Programme (GGP). The first Swedish GGS, GGS2012, was carried out in 2012/2013. It was organised by a team of researchers of the Stockholm University Demography Unit (SUDA), among them the authors of this contribution, and fielded in collaboration with Statistics Sweden (Stockholm University, 2023; Thomson et al., 2015). The survey was linked to register data that cover the pre- and post-life-course history of respondents, including two waves of register follow-ups with data on demographic and socio-economic outcomes of the survey respondents that stretch through 2021. A grant from the Riksbankens Jubileumsfond (grant IN19-0584:1) enabled us to carry out the second large-scale Swedish Generations and Gender Survey (GGS2021) within the new round of GGP-launched surveys in Europe in

the early 2020s, i.e., the GGS II (Gauthier et al., 2023). This was once again implemented in collaboration with Statistics Sweden as the data collection agency and hosted by SUDA and Stockholm University as the organising institution (Andersson et al., 2021). The Swedish GGS has meanwhile been recognised by the Swedish Research Council as an official research infrastructure of national interest. The data from both Swedish GGSs are accessible for downloads from the official GGP site (www.ggp-i.org; Gauthier et al., 2023) within the framework of its GGP-ESFRI (European Strategy Forum on Research Infrastructures) structures.

In this contribution we present some central aspects of the Swedish GGS2021. We first describe the fertility- and survey-related background that motivated us to participate in the second round of the GGP-anchored surveys (GGS II). We then depict two new modules included in the GGS2021 that add novel theoretical perspectives to the GGS. The modules were first implemented into the Swedish GGS2021 and will become standard modules in the second panel waves of the GGS II in the international Generations and Gender Programme. After this we describe some aspects of the GGS2021 data collection activity and the data quality, including comparisons of the GGS2012 and GGS2021 and the GGS2021 and register data. We conclude with some general reflections on our new modules and on register-linkages within the framework of Generations and Gender Surveys in the Generations and Gender Programme.

Motivation for a new round of the Swedish GGS

Three main reasons motivated us to engage in the new round of the GGS rather shortly after having just participated in the first and previous round of GGSs. These reasons can be summarised as follows.

Seeking explanations for the ongoing Swedish fertility decline

Sweden, like many other post-industrial countries, have experienced family-related demographic changes that challenge most previous assumptions and theoretical explanations of such trends. Since the early 2010s the Total Fertility Rate (TFR) of Sweden has been falling continuously to reach unprecedentedly low levels during the course of 2022-2023. The decrease has been surprisingly homogenous across geographical regions, age groups, labour-market categories and socio-economic strata (Ohlsson-Wijk & Andersson, 2022). The decline and its uniformity have puzzled demographers and social scientists. Equally puzzling is that the decline has been primarily driven by a decrease in first births. Childless couples have increasingly abstained from becoming parents (Ohlsson-Wijk & Andersson, 2022; for similar results in other Nordic countries, see Hellstrand et al., 2021). Structural factors, such as a dwindling economy, increasing unemployment

rates, persistent or growing gender inequality in family or work, are no explanation for these phenomena. On the contrary, Sweden's economy grew, employment increased, and gender-egalitarian family policies were further strengthened during the 2010s (Neyer et al., 2022). Changes in union formation can also be excluded as a cause for the fall of the fertility rate. Cantalini et al. (2024) show that the propensities for union formation did not decline during the 2010s and that cohabitation rates remained remarkably stable. The decline of first birth rates among the childless can thus not be attributed to single women's and men's hesitancy to form a co-residential union (see also Hellstrand et al., 2022 for similar findings for Finland).

The lack of structural explanations for the fertility decline suggests that subjective factors may have become more relevant in couples' childbearing considerations. To investigate this assumption, one needs survey data that include participants' subjective views, collected at least at two time points, one prior to or at the beginning of the fertility decline and one after a sufficiently long period of decline. The GGS was ideally suited to fulfil these conditions. The GGS standard questionnaire of the first and second rounds of data collection contains many questions directed at subjective views of fertility-relevant issues, such as childbearing intentions, the gender-division of work, and attitudes to parenthood. In retrospect, we were fortunate to having fielded the first GGS in 2012, i.e., at the very onset of the ongoing Swedish fertility decline. The launch of the GGS II in 2020-21, i.e., after almost a decade of fertility decrease, thus offered a unique opportunity to re-collect subjective views and objective conditions, and to compare which factors may have changed between the fieldworks of the GGS2012 and GGS2021 and how these changes may be related to the fertility decline.

Exploring new rationales of fertility

The concurrent declines of the fertility rate in several countries with markedly different welfare, family and gender systems and the lack of structural explanations for these declines have led researchers to consider that the subjective determinants of having children have also changed. They assume that new and so far un-researched rationales for having children may have been emerging. Recently adapted sociological and gender-norm theories in fertility research postulate that imaginations and perceptions of the future - of one's own future or that of one's (potential) children - have become increasingly pertinent for childbearing considerations (Vignoli et al., 2020a; Hays, 1996). Due to the benefits of the linkages of the Swedish survey to register data, we could shorten the GGS standard questionnaire to add two new survey modules that capture novel theoretical assumptions of fertility and family behaviour: a module on the perception of Global Uncertainties and a module on Intensive Parenting. These modules introduce novel perspectives into the surveys of the GGP. We detail the modules below. Both modules have now been selected by the GGP-ESFRI to become incorporated into the upcoming second panel wave of the GGS-II standard questionnaire.

Providing a comparative perspective

The GGP-ESFRI is currently the most important and widely used longitudinal social-science research infrastructure for research on fertility and family dynamics. It covers European as well as non-European developed countries. Among them are many societies which, like Sweden, have experienced a decline of their fertility rates since 2010 (e.g., almost all Western European countries). We regarded it therefore as scientifically imperative to participate in the GGS II. Having the possibility to compare the developments across countries and study the long-term development through subsequent waves of the GGS widens the explanatory potential of the Swedish and any other national GGS. The availability of a large number of GGSs in countries with similar childbearing conditions as Sweden (e.g., the other Nordic countries) or with very different childbearing conditions (e.g., Austria, the Netherlands, the UK, Uruguay) allows us to investigate whether the patterns and the driving factors of the fertility decline for Sweden are particular to this country (and similar countries) or whether they also occur in other (very different) contexts.

Additionally, Sweden has often served as a model and reference country for family policy adaptation as well as for cross-country comparisons of fertility and family development. The GGP-ESFRI includes or has recently expanded towards countries whose policies have been inspired by Swedish family policies (e.g., Germany, South Korea, Canada; see Windwehr et al., 2022). Sweden being part of the GGS II allows us to study how fertility developments after policy reforms in another country compare to those of Sweden and which subjective and objective GGS-included factors may have played a role to produce a similar or different outcome. This allows us to draw more nuanced conclusions about policy transfers and their possible effects on childbearing and fertility development.

In sum, our motivations to carry out the GGS2021 were driven by our research interest to find explanations for the ongoing and unexpected fertility decline and its surprising pattern, the advantages that the GGS offers as a longitudinal, comparative survey with an array of respondents' subjective views on fertility and family, and the possibility to include new, theory-driven modules that introduce novel perspectives of childbearing considerations to fertility and family research.

Perceived Global Uncertainties and Intensive Parenting – Two new theory-driven modules for the GGS

In several countries, the current trend of fertility decline started in the wake of the Great Recession of 2007/2008. Researchers therefore assumed that perceived economic uncertainty about the future played a crucial role in depressing fertility (Vignoli et al., 2020b; Comolli, 2017; Comolli et al., 2021). Studies of the impact of the Great Recession on

fertility confirmed that perceived economic uncertainty may lower childbearing intentions (Comolli, 2017; Matysiak et al., 2021). Further experimental studies corroborated this finding (Vignoli et al., 2022; Lappegård et al., 2022). However, Sweden, like most other Nordic countries, was not much affected by the Great Recession (Comolli et al., 2021). The decline of fertility started despite a very short and moderate recession, and it continued despite subsequent economic growth. We therefore assumed that not only purely economic forces were at play and concentrated our attention on two other aspects: perceptions on global uncertainties and intensive parenting.

Global uncertainties

Over the past two decades, several global issues arose or drew much public attention, such as the occurrence of climate change, increased number of refugees, terrorism, economic crises, or growing social inequality. These may have spurred people's perceptions of living in a world of increasing risks (Beck, 1986; Hays, 1996) and made them hesitant to have a child. Together with colleagues from the other Nordic countries and Italy we therefore developed a new survey module on perceived Global Uncertainties (Figure 1; Andersson et al., 2020). We relied on questions and items that had been tested in previous surveys, such as the international Population and Policy Acceptance Survey or the annual panel surveys of the Swedish Society, Opinion and Media Institute (for details, see Andersson et al., 2020). Due to the outbreak of the Covid-19 pandemic, we also added global pandemics as an uncertainty item, and adjusted the questions to fit fertility research and similar tested questions on perceived economic uncertainty (Vignoli et al., 2020a).

87. Thinking about the future, how much does the following worry you?
Check one option in each row.

	Very worrying	Somewhat worrying	Not particularly worrying	Not at all worrying
a. Terrorism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Overpopulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Economic crises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Increased number of refugees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. High unemployment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Organised crime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Military conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Global epidemics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Weakened democracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Increased social inequality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Political extremism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Prospects of coming generations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1. Perceived global uncertainties in the Swedish GGS2021

Research on perceived economic uncertainty and fertility intentions suggests that resilience, that is individuals' belief in the recovery of the economy or in finding a new job in case of unemployment, mitigates or even cancels out the negative impact of perceived economic uncertainty (Gatta et al., 2022). Endorsing this finding, we also added a question on trust in national institutions and the EU. We relied on institutional trust modules that have been used in other surveys. Relying on psychological theories, we furthermore acknowledged that personality traits may shape uncertainty perception and resilience. We therefore added a question on a person's outlook on the future, her/his optimism about the future and her/his agency perception (Andersson et al., 2020). Together with the questions on perceived economic uncertainty and resilience proposed by our Italian colleagues (Vignoli et al., 2022), the Swedish GGS2021 thus includes a battery of questions that brings individual perceptions of global issues of the future and resilience at the institutional and individual level into fertility research. The Global Uncertainties module was also incorporated into the GGS II in Denmark, Finland, and Norway, so that it will be possible to compare whether global uncertainty exerts a similar effect on fertility considerations in all Nordic countries. At the time of writing this contribution it has also been incorporated into the GGSs of Estonia, Germany, Croatia, and Moldova.

Intensive parenting

Recent research on Sweden and the other Nordic countries has shown that fertility outcomes have converged across cohorts by gender but diverged by educational attainment. This indicates growing social inequalities in fertility (Jalovaara et al., 2019). The reasons for this development are unclear. Some researchers assume that it may be linked to changing norms of parenting (Hays, 1996). This concerns in particular increasing demands on parents to invest more resources, time, and intellectual and emotional support into their children in order to protect their future social status and ensure their future success. Such normative changes towards intensive parenting have been observed in several post-industrial countries, with partly diverse institutional support for parents and children (see, e.g., Gauthier et al., 2021). Research on the prevalence of intensive parenting and the role it may play in the fertility decline in Sweden and other countries is still missing. We therefore extended the attitudinal questions of the GGS II standard questionnaire to include new items that capture key dimensions of intensive parenting: child-centeredness, stimulation, and demands on parents (Billingsley et al., 2023a).

These questions are based on the Intensive Parenting Attitudes Questionnaire (IPAQ), developed and validated by a team of psychologists (Liss et al., 2013). The GGS2021 module focuses on three domains of the IPAQ, with survey items on stimulation, child-centeredness, and demanding issues, instead of its original five domains, but expands the three included domains with items that belonged in the other two domains of the IPAQ. Each of the three domains of the GGS2021 is represented by three survey items (instead of two as in the IPAQ; see Figure 2). The three domains and the items incorporated into the GGS2021 have been recognised as essential for the expansion of

intensive parenting (Billingsley et al., 2023a; Gauthier et al., 2021). They were tested in a three-country cross-national comparison as part of the European Social Survey in 2017 and further investigated in a pilot study by Polish demographers and psychologists (Bryzek et al., 2022).

The module on Intensive Parenting adds two important new dimensions to attitudes and subjective views in the GGS2021. It combines the perspective of perceived (future) parenting demands with that of the perceived future social status of one's (potential) children. It thus aligns with researchers' assumption that subjective views and imaginations of the future lie behind the fertility decline of the last decade.

Do you agree or disagree with the following statements? Check one option in each row.		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a.	Parents never get a mental break from their children, even when they are physically apart.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	It is important for children to be involved in classes, lessons, and activities that engage and stimulate them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Childrearing is a really demanding job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Children should be the center of their parents' attention.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	Finding the best educational opportunities for children is important even before they go to school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f.	Children's needs should come before their parents'.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g.	Being a parent means never having time for oneself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h.	The child's schedule should take priority over the needs of the parents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i.	It is important to interact regularly with children on their level (e.g., getting down on the floor and playing with them).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 2. *Intensive parenting module of the Swedish GGS2021*

Note: The questions that represent different dimensions are the following. Stimulation: b, e, and i. Child-centeredness: d, f, and h. Demanding: a, c, and g. (Billingsley et al., 2023a).

As mentioned, the GGP-ESFRI will include the new modules on Global Uncertainties and Intensive Parenting from the Swedish GGS in the second panel wave of the GGS II. Together, the three perspectives of perception - economic uncertainty, global uncertainty, and intensive parenting – significantly broaden the scope of subjective views and imaginations of the future in the GGS. Together, they provide a theoretically well-grounded basis to investigate the reasons for the recent fundamental changes in childbearing behaviour across developed countries.

The Swedish GGS2021 in numbers and figures

Two aspects of the Swedish GGS2021 are particularly noteworthy for the user community: First, the linkage of the survey with register data and what this implies for data collection, non-response, and data reliability. Second, the integration of the two modules described above in the GGS2021. In this section we describe central aspects of the data collection process, present overall (non-)response and item (non-)response, and exemplify issues of data quality by comparing essential GGS2021 outcomes with those of the register data.

Data collection

Work on the GGS2021 started in 2019, after securing funding from the Riksbankens Jubileumsfond and receiving ethical approval from the Swedish Ethical Review Authority. The fieldwork, administered by Statistics Sweden, was planned for 2020. The outbreak of the Covid-19 pandemic forced us to postpone data collection in order to avoid biased survey responses due to the many uncertainties that the pandemic engendered at its beginning. The survey was finally carried out between mid-March and mid-August 2021, when the hype of the pandemic had largely calmed down.

The Swedish GGS2021 was an online survey with the option of responding in a paper version. The sample consisted of 30,000 individuals aged 18 to 59, randomly sampled from the 5,532,118 persons aged 18-59 years listed in the Swedish national population register. There was no over-sampling of specific sub-groups or procedure with stratified samples. Sampled persons who did not respond to the first invitation letter received up to three reminders to participate. The paper questionnaire was sent out with the first postal reminder, three weeks after the initial invitation to participate, and again with the third reminder, nine weeks after the initial invitation (for details of the survey and fieldwork, see documents at Stockholm University, 2023). 8,082 persons responded positively to the survey request. This makes a response rate of 27%. About 12% responded to the initial invitation, almost 9% to the first reminder, and 3% each to the second and third reminder. The overall response rate was somewhat lower than what we and Statistics Sweden had expected, but still higher than the corresponding response rate in several other participating GGP countries (Gauthier et al., 2023), despite the fact that GGS respondents in Sweden were neither paid nor offered any other reward for their participation. Slightly more than two thirds of the respondents (5,466 persons, 67.6%) chose to answer the questionnaire online; about two thirds of them (64%) used a desk- or laptop, one third (33%) a smartphone (and the rest a tablet). Survey participants had also the option to choose between a Swedish and an English version of the questionnaire. Almost all (95%) of those who filled in the questionnaire used the Swedish version. Survey items derived from registers were linked to the survey responses following informed consent to participate in the survey. The consent procedure involved a specification of the data to be derived from registers and the variables to be collected in future follow-ups during the five years fol-

lowing the survey date. The final data also contain standardised sample weights to correct for the selective non-response of specific population sub-groups.

Analysis of the total (non-)response

The vast majority (96%) of persons who did not participate in the survey simply did not respond to the invitation and the reminders. The rest could either not be reached, was unable to participate, sent in a blank or unusable questionnaire, or a wrong person answered it.

The analysis of non-responses showed that the response rate was higher among women, the highly educated, older persons, and those born in Sweden. Figure 3 displays the odds ratios of responding to the survey for these explanatory variables in a multivariate logistic regression model (for the selection procedure of explanatory variables, see Löfgren, 2021a).

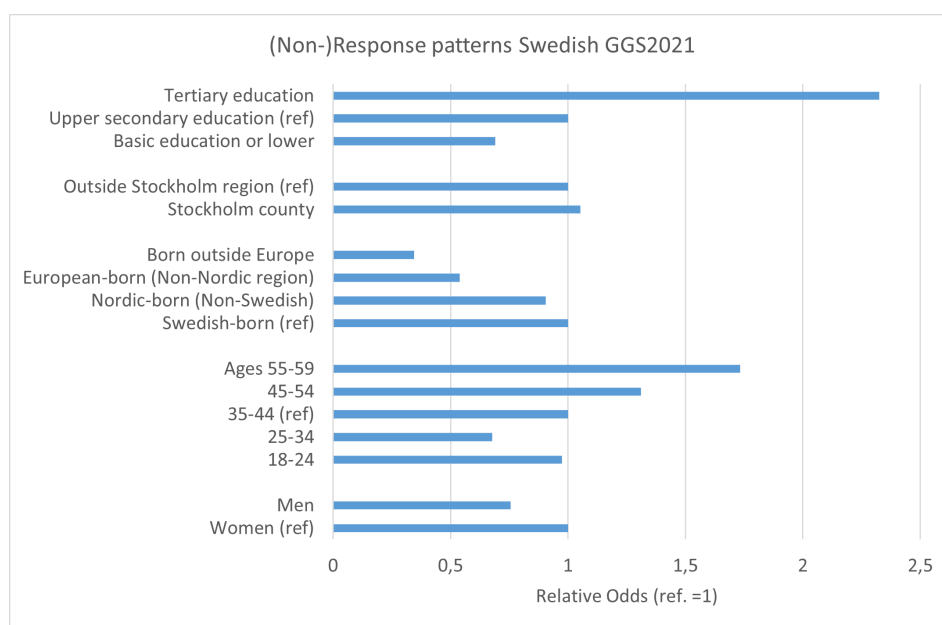


Figure 3. *(Non-)Response patterns in the Swedish GGS2021*

Notes: The multivariate model includes the variables as specified in Figure 3

Source: Löfgren, 2021b

The (non-)response pattern in the GGS2021 was surprisingly similar to the (non-)response pattern in the GGS2012, despite their different modes of data collection and overall response rates (GGS2021: web-based with paper option and an overall response rate of 27%; GGS2012: telephone interview with follow-up postal questionnaire and an overall response rate of 54%). Figure 4 presents and compares the odds ratios from multivariate logistic regression models of survey response by gender, educational attainment, and age group in the GGS2021 and GGS2012. (For input on the logistic regressions for survey responses in the GGS2021 and GGS2012 see: Löfgren, 2021b; Franzén, 2014.)

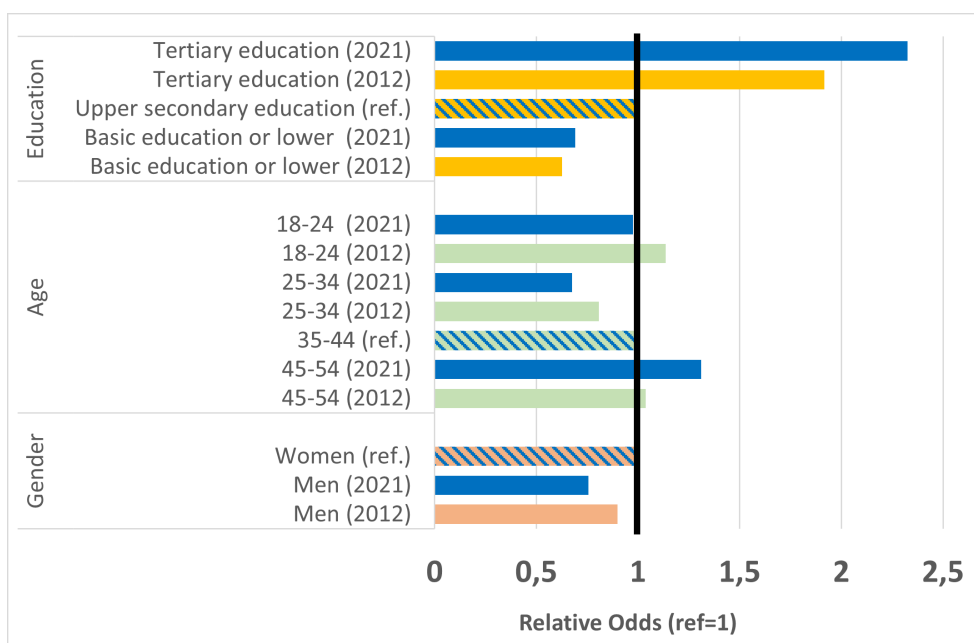


Figure 4. Comparison of (non-)response patterns in the Swedish GGS2021 and GGS2012

Source: Löfgren, 2021b; Franzén, 2014

Table 1 provides additional raw data by means of the response rates in the Swedish GGS2021 for an extended set of population characteristics.

Table 1. *Survey response rates in the Swedish GGS2021, by selected population characteristics*

Gender	Man	23.3%
	Woman	30.9%
Age	18-24	20.1%
	25-34	20.5%
	35-44	27.0%
	45-54	32.7%
	55-59	37.8%
Birth country	Sweden	30.8%
	Other Nordic country	30.3%
	Non-Nordic	14.9%
Education	Primary	13.1%
	Secondary	21.9%
	Tertiary	38.1%
Civil status	Married	32.4%
	Non-married	24.0%
Parental status	Childless	26.5%
	1 child	27.2%
	2 children	30.0%
	3+ children	21.6%
Total		27.0%

Source: Löfgren, 2021a

Item (non-)response

In the Swedish GGS2021, as in the Swedish GGS2012, we collected some of the data from registers, instead of asking respondents about them. Linking register data to the survey has the advantage that, first, the non-response rate on selected items is zero and, second, that one gets very precise coverage of a respondent's life course on the items that are available from the registers. This is particularly relevant for retrospective questions (e.g., beginning and ending of spells of marriage and cohabitation) and for sensitive questions (e.g., incomes). Information that we derived from register data in the Swedish GGS2021 include: information on demographic events, such as births, marriage, divorce, internal and international migration, and information on employment and incomes. Different types of data have different longitudinal depth. The population registers with data on demographic outcomes stretch back to the 1960s; data on employment and incomes begin in 1990, and data on non-marital cohabitation is available from 2011 onwards. Although the availability of register data allowed us to retrieve accurate information about essential aspects of a person's life course, we still had to ask many life-course related questions if the register information was not available for everyone (e.g., histories of

non-marital cohabitation or birth dates of parents since these are not available for periods before 2011, for older respondents or for migrants who spent parts of their life course in another country than Sweden). We also had to ask some questions even if they could be retrieved from registers, because the question served as a filter in the survey (e.g., birth dates of children because of subsequent inquiries about the relationship between the respondent and child). Further, data from registers can be used to correct wrong entries or add missing information.

The item non-responses in the Swedish GGS2021 ranged from 0.2% to 15.5%. The mean non-response over the 221 items was 2.29%; the median was 1.39%. This is a low item non-response rate; researchers consider an item nonresponse rate of less than 5% as non-serious (Riedel, 2005). To provide some insight into which variables were above this threshold, we looked at all 22 items with a non-response rate of more than 5%. Table 2 lists the item number, the code of the question in the GGS II standard questionnaire and the English text of the question in the Swedish GGS2021 for those items. Several aspects are striking: First, the vast majority of elevated item non-responses (17 out of 22) concerns questions that asked about a date: year and month when an event occurred. Second, most of the highest non-response rates (10% and above) concern previous relationships. Third, almost half (10 out of 22) of the item non-responses above 5% were produced by men. It was also mostly men who generated the highest item non-response rates (5 out of 7 item non-responses above 10%). Fourth, only one item non-response of more than 5% related to a monetary issue (total debts of the household, a sensitive question that usually has very high shares of non-response (Yan et al., 2010)).

The non-response rates to the items in our new modules were negligible. For the items of Global Uncertainties, they ranged from 0.9 to 1.3%; for those of Intensive Parenting from 2.0 to 2.6%.

Apart from these issues of item non-response there is no further information on partial responses to report. The web version of the survey brought a submit function at the very end of the survey, and the postal survey also induced respondents to submit their survey after having completed the full questionnaire.

Data evaluation – a comparison between register and GGS2021 data

To assess the reliability of the GGS2021 data, we calculated and compared a few core fertility indicators from the GGS2021 and the population register data. Figures 5 to 7 show the results for completed cohort fertility (CTFR), the proportion childless at age 40, and mean age at first, second, and third birth for women and men born 1962–1977. For women, the GGS2021 estimates and the register data correspond almost completely for all indicators. There is some random variation in the GGS data for some cohorts but no systematic differences in relation to the register-data standard. All differences are small, maximum 0.34 children for the CTFR measure, maximum six percent for the fraction childless, and maximum 1.4 years for the measures of mean ages at childbirth. For men, the results of the GGS2021 and the register-data analyses deviate somewhat more

than for women, especially with regard to ultimate childlessness and mean age at third birth. Men's reported ultimate childless in the GGS2021 oscillates much more by cohort than what they do for women. However, similar to women, the differences between the GGS2021 and the register-data outcomes are small, with a maximum deviation of 0.42 children for the CTFR measure, ten percent for the fraction childless, and 2.3 years for the mean age at third birth. Despite these differences in values for specific cohorts, there is hardly any systematic direction in the deviations of indicators over the cohorts. The overall trends of the CTFR, ultimate childlessness and mean ages at childbirth are the same in the GGS2021 and in the register data, however with minor deviations in the childbearing ages by men in the younger cohorts. Any other differences for specific cohorts of women and men appear entirely attributable to the forces of random variation, rather than to a biased sample of GGS2021 respondents.

Table 2. *Item non-response in Swedish GGS2021*

Item number	Code in GGS Standard Questionnaire	Question in Swedish GGS2021	in %
F 35-e-man1	LHI14	When did this (first of previous) relationship end?	15.5
F 109-man	WRK03b	When did this (current) period of employment/self-employment begin?	15.2
F35-a-man1	LHI04	When did you start living together (previous relationship)?	14.0
F 59-man	GEN52a	When did you for the first time start living separately from your parents (at least 3 months)?	13.0
F 35-c-man 1	LHI17	When was she born (partner in first previous relationship)?	11.0
F 51	Fer27c	<i>Does your partner want a child?</i>	11.6
F 109-all	WRK3b	When did this (your current) activity begin?	10.7
F 71-all	GEN37	When did your parents marry?	9.9
F 18-b-man	DEM30b	When did you start living together (with current partner)?	9.7
F 65-all	GEN23	When was your father born?	8.9*
F 19-b-man	DEM28b	When did you (you and your current partner) marry?	8.5*
F-73-all	GEN38b	When did your parents separate?	8.2
F 24-d	HHD13d	<i>Who usually performs the following task = helping child with homework?</i>	8.1
F 60-all	GEN09	When was you mother born?	7.7*
F 39-a-man1	CP05/LHI29	<i>When was the child born (1st child not living in household)?</i>	6.6
F 110	WRK01b	<i>How satisfied are you with your current activity?</i>	6.4
F 111	WRK26	<i>Did you have a job or business directly before your current activity?</i>	5.6
F 125_kr	INK02	Taking into account all your household's mortgages-how much are your total debts?	5.6
F 99-man	WRK3a	When did this period of your (current) employment/self-employment begin?	5.3
F 18-b-all	DEM30b	When did you (and your current partner) start living together?	5.2
F 35-e-all1	LH14	When did your (first of your previous) partnership end?	5.2
F 11-man	DEM31	When did this (current) relationship start?	5.0

Note: *only web-based answers. Explanations to original GGS2021 (in parenthesis); some questions shortened for this overview; Italics = question not a "when" question.

Source: Statistics Sweden 2021 and GGS2021 questionnaire.

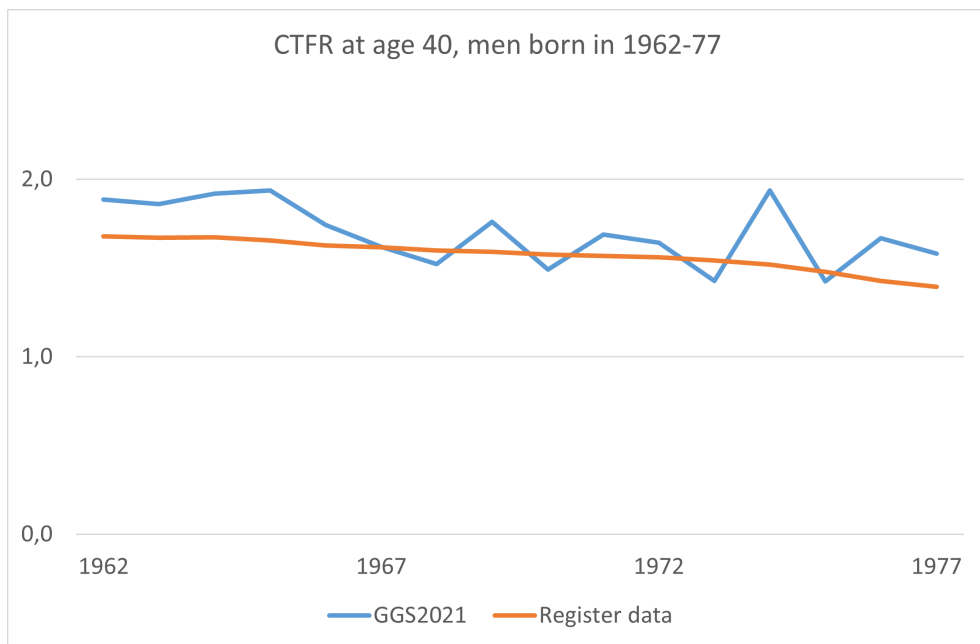
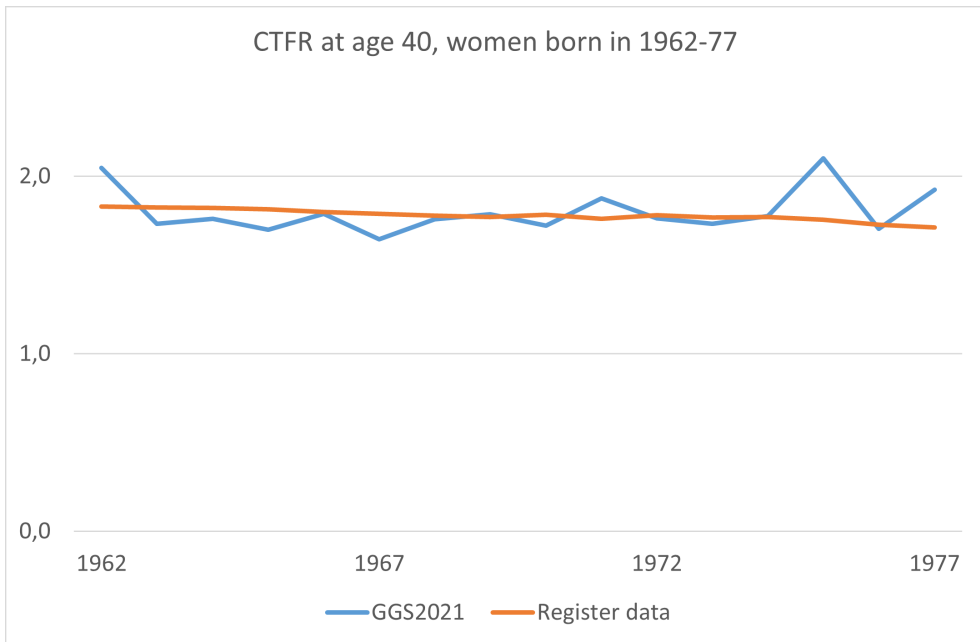


Figure 5. Completed cohort fertility – comparison of register data and GGS2021 for women and men

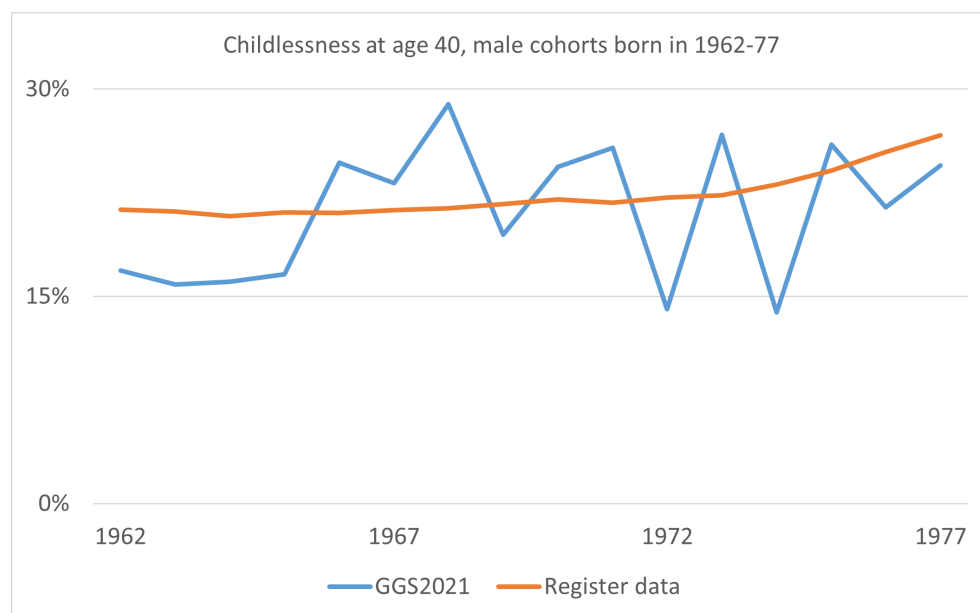
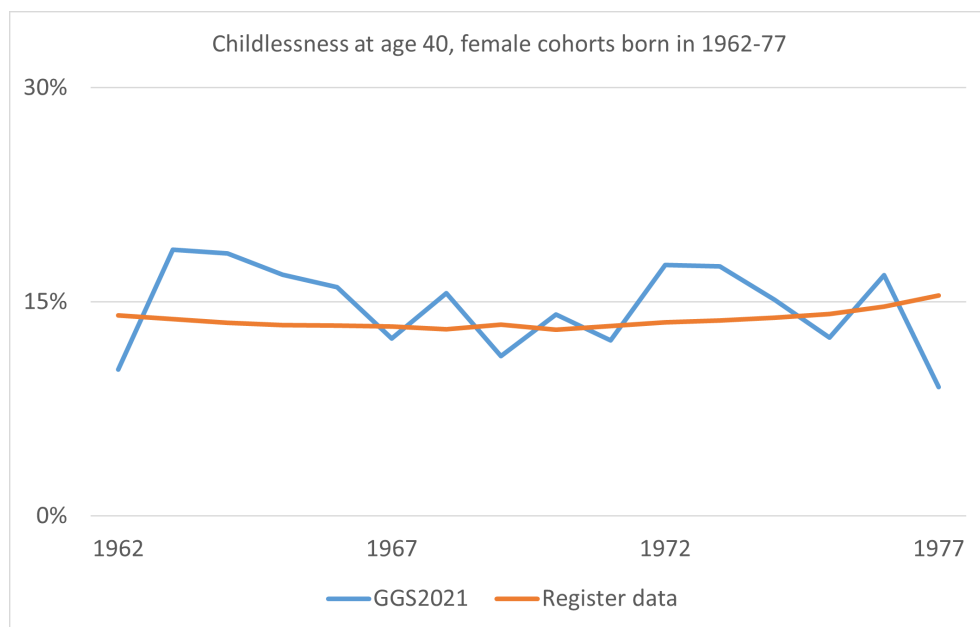


Figure 6. Childlessness at age 40 (percent) – comparison of register data and GGS2021 for women and men

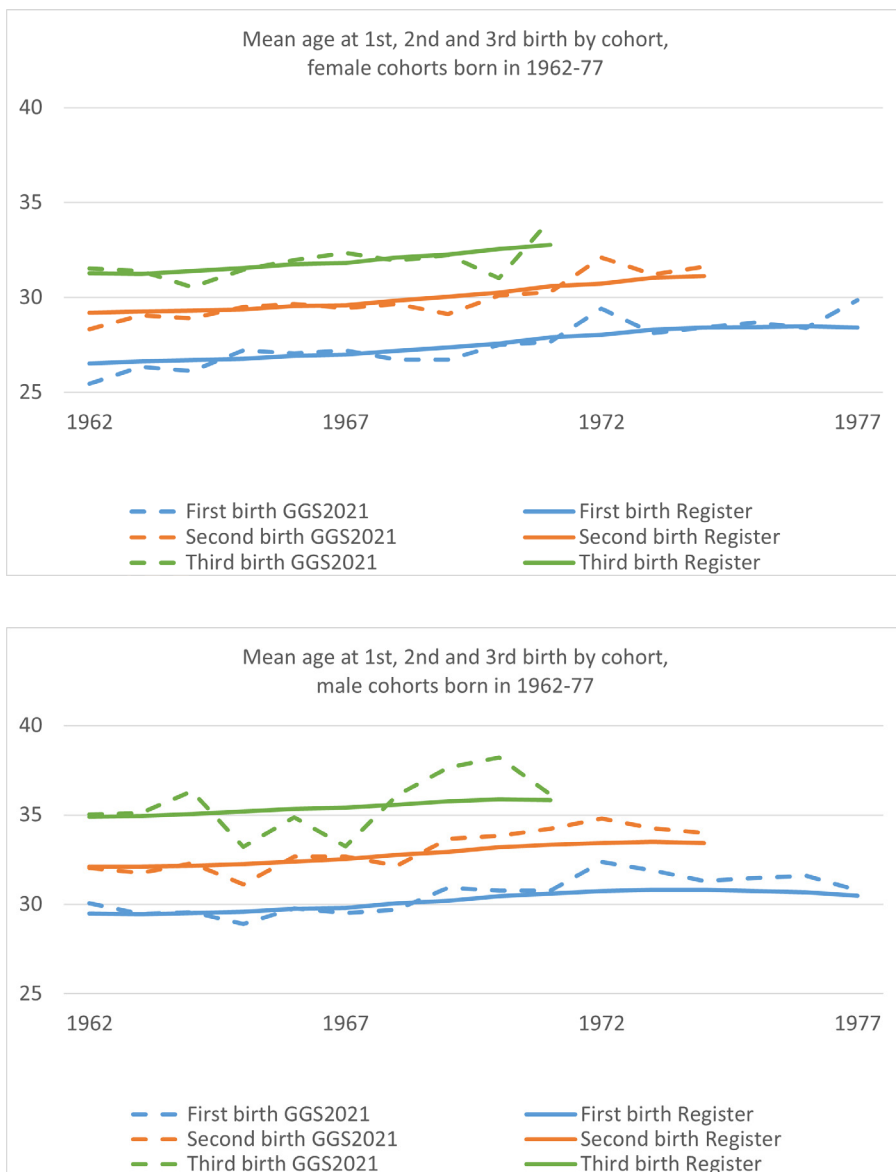


Figure 7. Mean age at childbirth by parity and cohort: comparisons of register data and GGS2021 for women and men

Conclusions

Seeking explanations for the unexplained recent fertility decline in Sweden was one of the main motivations for us to engage in the GGP second round of data collection and carry out GGS II in Sweden. The GGP-ESFRI offers an excellent social science data infrastructure to investigate the potential causes of this decline. For, fertility has not only been declining in Sweden, but in most other developed countries in Europe and beyond.

Many of these countries participate in the GGP. The availability of comparative data covering individuals' life courses as well as their subjective views on childbearing and family relationships provides a unique setting to determine transnational and country-specific factors that may lie behind the observed fertility decline.

The Swedish GGS2021 is unique in two aspects. First, we were able to include two new modules related to recently emerging theories on perceived uncertainty and imaginations of the future in relation to fertility: those of Global Uncertainties and Intensive Parenting. The module on Global Uncertainties has also been included in the GGS II of the other Nordic and (so far) a few additional countries. Preliminary analyses of both modules show that fertility intentions are indeed shaped by these items (Neyer et al., 2022; Billingsley et al., 2023b). The inclusion of these modules in future second panel waves of the GGS II in all participating countries will thus be an exciting step for exploring the impact of a range of uncertainties and of parenting demands in a comparative perspective.

Second, the Swedish GGS2021, like the GGS2012, is a register-linked survey. We are convinced that register-survey linkages of data offer several advantages in terms of data collection and may also offer an avenue for other GGP countries to pursue. First, it is a specific goal of the GGP to provide data that cover respondents' life courses. High shares of non-responses to questions about when something has happened or to questions that may otherwise be perceived as sensitive impede much of life-course research. These problems may aggravate as family relationships become more complex or employment less stable over the life course. Retrieving answers from available registers minimises the issue of missing information. Second, register linkages shorten a questionnaire and may make it more likely that respondents participate and/or complete the questionnaire. The fairly decent response rates of the Swedish GGS2021 compared to other GGSs II, with no financial incentives for respondents, seems to support this view. Third, the GGS is a panel survey. Linkages to registers allow for follow-up waves with no attrition for events that are included in the registers. This may be an essential aspect for future research, e.g., when investigating fertility intentions and their subsequent realisations. Fourth, surveys are sometimes very costly. Using register data cuts the costs significantly. The availability of web-based GGSs in other countries and upcoming new waves of the GGS II will provide opportunities to enhance our knowledge on how to develop the GGP research infrastructure further in order to maintain its high scientific quality also in the future.

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