Partnership dynamics and the fertility gap between Sweden and Spain

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1. Introduction

Below-replacement fertility is now a universal trend, though, cross-country differentials among low fertility countries persist. Despite these differences often being correlated with variations in timing and intensity of adulthood transition events—such as leaving the parental home, forming a stable partnership, getting married, and entering parenthood, family demographers and sociologists have paid little attention in quantifying the influence of these transitions on childbearing behaviors in a comparative perspective. While most empirical research focuses on the micro-level, failing to connect findings to broader population dynamics, fertility theories tend to focus on more macro-level explanations that emphasize aspects such as ideational change (van de Kaa & Lesthaeghe 1986; Lesthaeghe 2010), uncertainty (Matysiak *et al.* 2020; Vignoli *et al.* 2020), gender equality (Anderson & Kohler 2015; Esping-Andersen & Billari 2015; Goldscheider *et al.* 2015), or human development (Myrskylä *et al.* 2009). Even though scholars have noticed the importance of expanding fertility research to cover men in the last century (Goldscheider & Kaufman 1996), little has been done considering this perspective. In this paper, we aim to quantify the influence of partnership formation on fertility first birth differences between Spain and Sweden for both sexes. We focus on the transition to first birth as this is when we expect stable partnership status to have the largest influence in terms of childbearing (Esteve *et al.* 2021); additionally, we also know that the timing at which the first birth occurs has important consequences for achieving higher order fertility. The question we ask is to what extent does having a stable partner influence entering parenthood between Spanish and Swedish women and men? The response to this question may have significant implications for theory development as it will contribute to signal where possible sources of differences emerge.

We focus on first birth as having a partner matters most in this parity, and partnership issues are hardly cited as a reason for transitioning to higher-order births (Esteve *et al.* 2021). Moreover, the impact of partnership dynamics on first birth may have consequences on higher-order fertility; delaying or foregoing first births may decrease the number of women and men who have a second child. We directly compare Spain and Sweden taking cohort and gender perspectives, and we focus on the cohort 1965-1969 based on the availability of data and intention to examine a cohort that has completed their reproductive period. The inclusion of men contributes to the important but limited research on their childbearing behaviors; moreover, we know stable partnership formation is a crucial factor contributing towards childlessness for men (Esteve *et al.* 2021). Please note, this study defines being in a stable partnership as having a co-residential partner, which we do not distinguish between marital or non-marital. The determinants which promote or deter stable partnership formation will not be identified and discussed here.

2. Data and Sample

We use data from the Harmonized Histories dataset, specifically the 2012/2013 Swedish Generations and Gender Survey (GGS) and the 2018 Spanish Fertility Survey (SFS) within this larger dataset. The 2018 SFS includes women and men born between 1962 and 2000, ages 18 to 55. It is a representative, cross-sectional survey conducted by the National Statistics Institute in Spain. Alternatively, the GGS is an international compilation of fertility surveys containing rich micro-level information on life-courses and family dynamics. The 2012/2013 Swedish GGS interviewed women and men born between 1933 and 1994, ages 20 to 80; the sample is representative, and the respondents are based on random samples taken from the Swedish population registers. While the original sample contains 14,556 Spanish women and 2,619 Spanish men from the 2018 SFS and 9,688 Swedish women and 1,468 Swedish men from the 2012/2013 Swedish GGS. Birth cohorts are grouped by 5-years and are chosen based on the overlap between the two surveys, with consideration towards following respondents through their reproductive career for as long as possible. After restricting our sample to native-born individuals with complete information on their partnership history, our final sample includes 7,471 and 1,355 native-born Spanish and Swedish women, respectively, along with 1,301 and 1,263 native-born Spanish and Swedish men, respectively. Furthermore, the retrospective nature of both surveys allowed us to construct individuals' stable partnership and childbearing histories during reproductive ages as person-years. Dates for our analysis were measured in months for more precision in timing of occurrence.

3. Three methods to examine the role of partnership on fertility

First-birth probabilities to examine transition to first birth in the next three years based on partnership status

Using retrospective data, we construct individual partnership and childbearing histories for native-born, childless women in each country and calculate first-birth probabilities as follows,

$$Pr(x,t,p) = \frac{N(x,t,p,b=1)}{N(x,t,p)}, \tag{1}$$

where x, t, and p indicate age, cohort, and partnership status respectively. $p = 1$ indicates women who have a stable partner, while $p = 0$ indicates the opposite. $b = 1$ means females who have a first birth within the next three years. $N(x,t,p)$ represents native-born childless women, given the age, cohort, and partnership status.

Observations three years before the actual survey year of each respective country have been censored in order to calculate the first-birth probabilities using only known information. This means that we censor all observations after 2009 for the Swedish sample, as the majority of interviews took place in 2012, and 2015 for the Spanish.

Kitagawa decomposition to separate rate and composition effects on first-order TFR differentials

We consider partnership status to contribute to the TFR for first births,

$$TFR(t) = \sum_{x=\alpha}^{\beta} ASFR(x,t) = \sum_{x=\alpha}^{\beta}\sum_{p=0}^{1} ASFR(x,t,p)C(x,t,p), \tag{2}$$

where α and β represent the minimum and maximum reproductive ages. $ASFR(x,t,p)$ and $C(x,t,p)$ are the age-specific fertility rate and the proportion of women, respectively, given the age, cohort, and partnership status.

We follow the Kitagawa (1955) approach and decompose the difference in TFR as the following,

$$\Delta TFR(c) = \sum_{x=\alpha}^{\beta}\sum_{p=0}^{1} \Delta ASFR(x,t,p)\bar{C}(x,t,p) + \overline{ASFR}(x,t,p)\Delta C(x,t,p), \tag{3}$$

where Δ and overbar mean the difference and average between two populations separately. For example, $\Delta ASFR(x,t,p) = ASFR(x,t,p,SWE) - ASFR(x,t,p,ESP)$, and
$\bar{C}(x,t,p) = \frac{C(x,t,p,SWE)+C(x,t,p,ESP)}{2}$.

Based on *Eq. (3)*, the two effects can be defined as,

Rate effect $= \sum_{x=\alpha}^{\beta}\sum_{p=0}^{1} \Delta ASFR(x,t,p)\bar{C}(x,t,p)$, and

Composition effect $= \sum_{x=\alpha}^{\beta}\sum_{p=0}^{1} \overline{ASFR}(x,t,p)\Delta C(x,t,p)$.

Then, the Total effect $=$ rate effect $+$ composition effect.

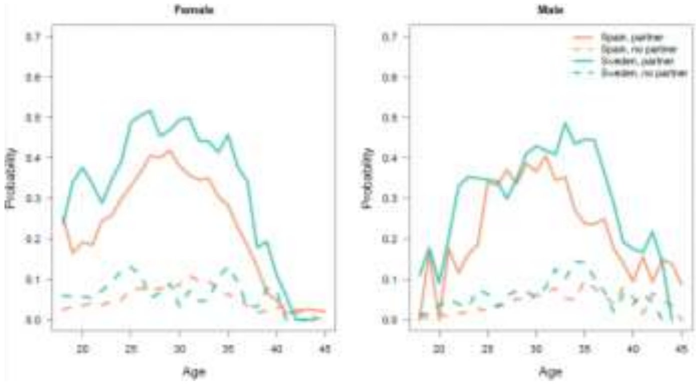
Standardization to explore hypothetical scenarios for first-order TFR if stable partnerships formed earlier/later

For the standardization, we employ *Eq. (2)* to calculate the hypothetical first-order TFR. We have two distinct scenarios, namely, prepone and postpone the forming of stable partnerships. We assume that the hypothetical proportion of stable partnerships at age x will reach the actual stable partnership proportion at age $x+n$ (or $x-n$), n representing the moving year(s). In other words, we move the $C(x,t,p=1,ESP)$ curve to the left (or right, correspondingly) n years. Note that the level of the hypothetical stable partnership proportion will remain the same as the observed proportion at the last age. Concerning the scenario of further postponement, we move the $C(x,t,p=1,ESP)$ curve to the right. For the first age, we consider that the declining speed is 0.02 per year. If the proportion is lower than 0, we force it to 0. It should be mentioned that we assume the $ASFR(x,t,p,ESP)$ keeps constant for both scenarios.

4. Results

Transitions to first births among childless women and men by partnership status

Figure 3 (above) shows the probability of experiencing a first birth within the next three years at a given age for Spanish and Swedish women based on stable partnership status. We observe that having a stable partner, as opposed to not, drastically increases one's probability of entering parenthood within the next three years at practically all given ages for women and men. Although the Swedish with stable partners have higher probabilities for first childbirth compared to their Spanish counterparts, the probability of having a first child within the next three years among partnered women and men are highest and concentrated within the age range 25 to 35 for both countries. Since the probabilities in Figure 3 do not consider the proportion of (un-)partnered individuals at a given age, we are unable to distinguish to what extent the first-birth rate and the composition of (un-)partnered women and men contribute to differences in transition to first birth between Spain and Sweden. Thus, we perform a Kitagawa decomposition to quantify this.



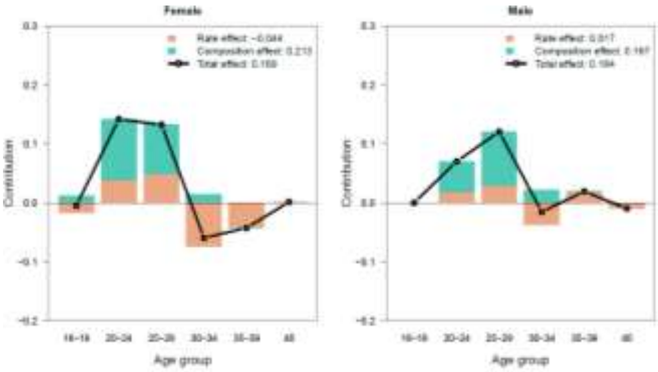


Fig. 3 (LEFT) Probability of experiencing a first birth within the next three years at a given age, based on partnership status, 1965-1969
Fig. 4 (RIGHT) Contribution of first-birth rate and partnership composition to the first-birth fertility differential between Sweden and Spain by age group, 1965-1969
Source: Calculated by authors based on the Spanish Fertility Survey (2018) and Swedish Generations and Gender Survey (2013) from the Harmonized Histories dataset.
Note for Fig. 4: $\Delta TFR = TFR_{SWEDEN} - TFR_{SPAIN}$.

Decomposing differences in first births between Spain and Sweden

We decompose the first-birth fertility differential of women (0.17) between the 1965-1969 birth cohort of Sweden and Spain. The contribution of the rate and compositional effects toward this difference are illustrated in above (Fig. 4). The composition effect plays a prominent, positive role between the ages of 20 to 29, suggesting that more Swedish women and men are in a stable partnership than their Spanish equals. Moreover, the rate effect is negative and is the dominant effect after age 30. Compared to the situation of women where Spanish women have higher fertility than the Swedish after age 30, dominated by the rate effect, Swedish men between the ages 35 to 39 experience more first births than their Spanish counterparts. What's more, this is also primarily driven by the rate effect. The decomposition result for women supports what we know from previous literature—Spanish women enter parenthood later relative to their Swedish counterparts. At the same time, there may be some selection as Swedish individuals who have entered parenthood have already done so by their 30s unlike their Spanish counterparts. Overall, the primary contributor to the first-birth differentials between Sweden and Spain is the composition effect (0.21), with Sweden observing relatively higher first-birth fertility. The total rate effect is trivial (-0.04) and only slightly offsets the positive composition effect. We decompose the total difference in first-birth fertility between Spanish and Swedish men as well (0.18). The (partnership) composition effect contributes significantly more than the rate effect (0.17 and 0.02, respectively). Meanwhile, the rate effect drives fertility among men starting from age 30. The rate effect explains the higher fertility of Spanish men between the ages of 30 to 34 and at age 40. Interestingly, Swedish men experience more first births between 35 and 39 years of age, but with the rate effect, and not the composition, driving this difference (as was the case for Swedish men at younger ages). From the 1970s cohort, however, this pattern changes.

What if Spanish women would have stable and co-residing partners earlier?

To further explore how the *timing* of first stable partnership formation impacts first-birth rates by age 40, we calculate hypothetical first-birth rates for native-born Spanish and Swedish women and men as if they were able to form a stable partnership one to three years earlier. We see in Figure 5, if stable partnerships would form three years earlier than the observed, the Spanish first-birth rate would nearly match the observed Swedish first-birth rate by age 40 with 0.87 and 0.88 first births per woman, respectively. Although the Swedish first-birth rate is remarkably higher than the Spanish rate before age 35, they converge by age 40. This is because most Swedish women have already entered parenthood prior to age 35 while most Spanish women have only begun entering parenthood during their 30s. Figure 5 also shows hypothetical consequences of further delaying stable partnership formation one to three years later, with outcomes suggesting unfavorable consequences for first-order births. We also calculate the same hypothetical first-birth rates for Swedish women. While the actual Swedish first-birth rate is 0.88, almost all Swedish women would be mothers (98.6 percent) in the hypothetical scenario where they form a stable partnership three years earlier than observed. On the other hand, a postponement of three years suggests that the first-birth rates of Swedish women would be very similar to the Spanish—both approximately 0.71. The same analysis was done for men.

Despite less men becoming parents in general relative to women, Spanish men have a much lower transition to first birth than Swedish men—TFR of 0.58 and 0.76, respectively. For Spanish men to have a similar fertility to their Swedish counterparts, Figure 5 suggests that stable partnership formation should take place five years earlier than the observed; the first-order TFR for Spanish men would then become 0.77. Regarding the Swedish male transition to fatherhood, on the other hand, a four-year postponement of partnership formation from the observed timing could lead to first-birth fertility similar to that of Spanish men—with slightly more than half having entered parenthood. Postponing stable partnership formation impacts first-birth fertility levels, but for Swedish men, this applies to a greater extent—especially compared to the effects of earlier partnership formation. This is due to partnership composition being the primary contributor to Sweden's high fertility instead of the rate. Therefore, the rate is unable to compensate for the negative impact of delaying partnership formation on the transition to first birth. On the opposite end, we observe only marginal increases in hypothetical TFR with each year brought forward in partnership formation among Swedish men. This is because of the already high contribution of partnership composition and the fixed rate of entering fatherhood.

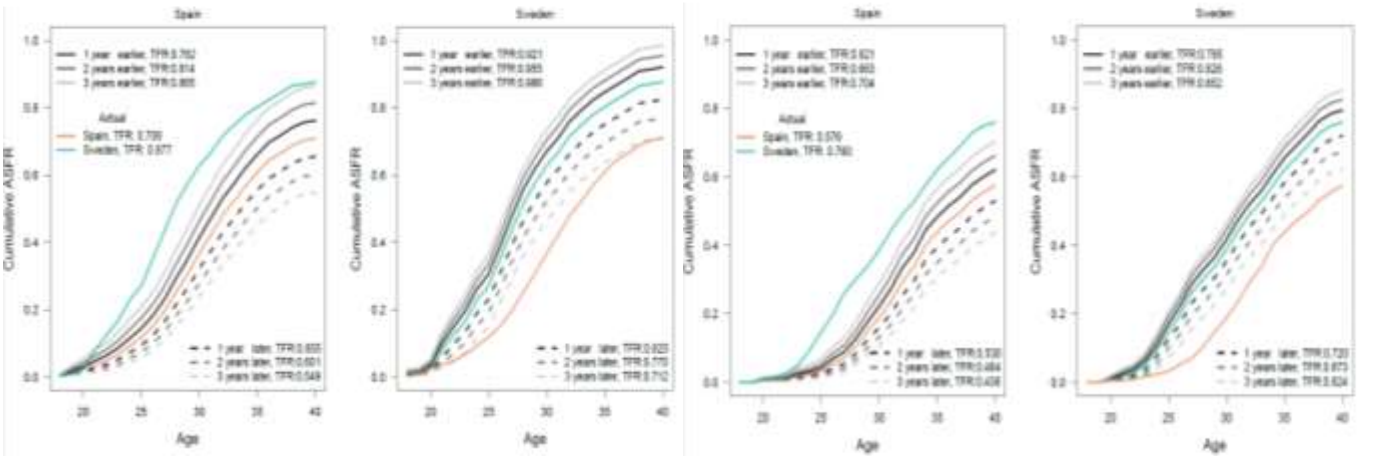


Fig. 5 Observed and hypothetical first-birth rates for Spanish and Swedish women **(LEFT)** and men **(RIGHT)** if they entered their first stable partnership earlier or later, 1965-1969
Source: Calculated by authors based on the Spanish Fertility Survey (2018) and Swedish Generations and Gender Survey (2013) from the Harmonized Histories dataset.

5. Conclusion

First, as we already know, having a stable partner as opposed to not is a crucial element for childbearing regardless of country or sex. Through this study, however, we are able to measure the importance of partnership formation with regards to having a first child. We find there are precise ages at which having a partner matters most (between the ages 25-35); this is illustrative of the age range deemed 'societally acceptable' for childbearing among women born between 1965 and 1969 in Spain and Sweden, and furthermore, indicates that having a stable partner earlier than age 25 or later than age 35 is less impactful in the transition to first birth. Being in a stable partnership between one's mid-20s to mid-30s is especially meaningful for entering parenthood, albeit the effect of having a stable partner on the transition to first birth remains higher in the latter half of that period for men than women. This aligns with previous findings—women form partnerships and have children earlier than men (Coppola 2004; Winkler-Dworak & Toulemon 2007). Second, the decomposition results suggest that the greatest contribution to the first-birth fertility differentials is the more dominant composition of Swedish women in stable partnerships at younger ages, relative to their Spanish counterparts; though, the difference is slightly offset by the high first-birth rates of Spanish women at later ages. Contrastingly, for men, both the overall rate and composition effects are dominated by the Swedish, with Spanish men only showing higher fertility, in comparison, during their early-30s and at age 40. Moreover, we find that partnership composition no longer contributes to first childbearing differentials between Spain and Sweden after age 30. Because Swedish individuals tend to have a first birth earlier than their Spanish counterparts, there exist some selection among those who enter parenthood at later ages. Third, the standardization results complement our decomposition results and emphasize that the timing of first stable partnership formation is key for improving the first-birth rate, particularly so for native Spanish women and men. We find that if Spanish women, who typically enter stable partnerships at later ages, cohabit with a stable partner three years earlier than what is observed for the 1965-1969 cohort of women, the first-birth rate would be similar to the Swedish by age 40—assuming the intensity of partnership formation and the timing and intensity of childbearing observed for Spanish women remains constant and nothing changes for the Swedish. Therefore, this finding suggests earlier stable partnership formation in Spain, a latest-late country, can contribute to higher first-birth rates even if their childbearing timing and intensity persists at the observed level. We also find the large effects of postponing partnership formation on the first-order TFR of Swedes. Most importantly, however, our findings we indicate the necessity for more research on the determinants of partnership dynamics—especially, as it most likely is related to transitions to adulthood and the difficulties faced by young adults to make these transition.

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