ORIGINAL RESEARCH

Employment uncertainty and parenthood: quantifying the mediating role of union formation

Giammarco Alderotti[1] · **Alessandra De Rose[2]** · **Valentina Tocchioni[1]**

© The Author(s) 2024

Abstract

This study aims to quantify the extent to which union formation mediates the relationship between employment uncertainty and the transition to parenthood, taking Italy as a case study. Research on the determinants of low fertility is increasingly shedding light on the negative effects of employment uncertainty. It is generally acknowledged that partnership formation plays a fundamental mediating role, as uncertain employment conditions may hamper the initial formation of a stable union, consequently affecting the likelihood of having a child. Nevertheless, it remains unknown how much of the (total) effect of employment uncertainty on fertility is indeed mediated by union formation. To perform the mediation analysis, we relied on the KHB (Karlson–Holm–Breen) method to accurately assess the effect of employment uncertainty on the transition to parenthood with and without controlling for union formation, i.e. the mediating variable. Results indicate that union formation mediates between 25 and 40% of the negative effect of employment uncertainty on the transition to parenthood, especially among men. Differences by cohort groups are evident, with the youngest cohorts being the most affected by such a mediation. We conclude that union formation is a key element in the relationship between employment uncertainty and fertility as it mediates a non-negligible share of the total effect of employment uncertainty on transition to parenthood.

Keywords Employment · Fertility · Union formation · Mediation analysis · Italy

✉ Alessandra De Rose
    alessandra.derose@uniroma1.it

1   Department of Statistics, Computer Science, Applications, University of Florence, Florence,
     Italy

2   Department of Methods and Models for Economics, Territory and Finance, Sapienza University
     of Rome, Rome, Italy

Introduction

The relationship between employment uncertainty and fertility dynamics has received increasing attention in demographic research. Recent events such as the Great Recession of 2008, the COVID-19 pandemic beginning in 2020 and the conflicts in Eastern Europe and Middle-East have seriously undermined the economic stability of most countries, reinforcing the idea that our contemporary, globalised societies must deal with unprecedented levels of uncertainty.

Such uncertainty is deemed to negatively impact family formation dynamics both directly and indirectly [i.e. by shaping individual expectations of the future (Vignoli et al., 2020a)].

In contexts of widespread and enduring low fertility, the role played by employment uncertainty as a potential inhibitor of fertility is of particular interest. Existing studies about the link between employment uncertainty and fertility mostly agree upon the fact that, in general, experiencing employment uncertainty negatively influences childbearing—albeit to different extents depending on gender and institutional context (Alderotti et al., 2021). An aspect that is widely mentioned in those studies is the role of partnership dynamics, since fertility mostly happens within close relationships. However, only a few empirical studies have taken explicitly into consideration the role of union formation as a potential mediator of the uncertainty/fertility relationship. Various studies relied on different ways to deal with this issue, such as focussing on partnered individuals only (e.g. Vignoli et al., 2012), controlling for union status (e.g. Miettinen & Jalovaara, 2020) or opting for simultaneous analysis of union formation and fertility processes (e.g. Aassve et al., 2006; Perelli-Harris et al., 2012). All these approaches are appropriate and functional to the aim of each study; however, no studies explicitly adopted a mediation approach to quantify the direct and indirect (i.e. mediated by union formation dynamics) effect of uncertain employment conditions on parenthood.

In this study, we aimed to formally test whether union formation mediates the relationship between employment uncertainty and transition to parenthood and quantify any mediated effect using high-quality retrospective data and applying mediation analysis techniques.[1] To accomplish our aim, we took Italy as a case study, a country characterised by low fertility levels, childbirths almost exclusively within close relationships and a late, but relatively fast, deregulation process of the labour market. Although our approach allows quantifying any mediated effect, we refrain from giving our results a causal interpretation because of the presence of selection and anticipation mechanisms that cannot be taken into account (issue discussed in the conclusions).

---

[1] As discussed later in the text, we refrain from interpreting our results in a causal manner; nevertheless, we use the term 'effect' throughout the paper to facilitate discussions on direct, indirect, and mediated effects.

Background

Employment uncertainty and its effects on union formation and fertility

Employment conditions are considered among the main drivers of family formation in high-income countries, both in terms of starting a union and having a child. Experiencing unemployment or precarious employment generates—or increases—economic uncertainty because of its effects on current income and future (long-lasting) earning opportunities (Scherer, 2009; Standing, 2014). In general, career instability undermines individuals' abilities to plan their future; for this reason, people tend to wait for more certain times—e.g. having a stable source of income—before making crucial decisions about family formation. Accordingly, most hypotheses about the relationship between employment uncertainty and family formation agree upon the fact that unstable job conditions negatively influence both union formation and childbearing. Oppenheimer (1988, 1994) was among the first to analyse the relationship between the instability of men's careers and changing demographic behaviours. Oppenheimer's hypothesis suggests that uncertainty around individual employment conditions (e.g. unemployment, temporary employment) undermines men's breadwinning capability, hampering, in turn, union formation and fertility. More recently, the globalisation and labour market deregulation perspective (Blossfeld et al., 2006; Mills & Blossfeld, 2013) reached the same conclusion, suggesting that marriage and parenthood are likely to be postponed in times of employment uncertainty because they involve long-term and burdensome commitments. An opposing view is offered by the uncertainty reduction fashion (Friedman et al., 1994), according to which individuals always tend to reduce uncertainty, and thus they (women especially) may choose to marry to reduce biographical uncertainty, as a response to negative employment prospects.

However, to define the relationship between employment conditions and family formation, we must consider that family dynamics and caregiving responsibilities have also evolved over time (see Raybould & Sear, 2021). From the early twentieth century to the 1980s, the association between women's paid work and fertility in high-income countries was predominantly negative. During this period, a clear division between genders prevailed, with men serving as primary earners, predominantly engaged in paid work, while women were primarily responsible for family duties and unpaid labour. However, this dynamic shifted towards the end of the twentieth century, as the relationship between female labour force participation and fertility began to trend positively in most high-income countries (Ahn & Mira, 2002). The need for a supplemental income within households for child-rearing plays a significant role in this shift. However, the overall dynamics of the relationship between female labour force participation and fertility are undoubtedly influenced by several factors, with the social context and family policies of each country being of primary importance. For instance, in contexts where leaving the labour market entails high costs due to limited and low-paid maternity leave, or where public childcare provisions are inadequate, female employment

tends to negatively impact fertility (Neyer et al., 2013). Moreover, in such contexts, the division of labour—both paid and unpaid—remains gendered, largely adhering to the male breadwinner model. Conversely, in settings with extended maternity and parental leave and extensive public childcare services, there exists a more equal division of paid and unpaid work within couples (e.g., Neuberger et al., 2022).

Empirical research on this topic does not provide a unique explanation of how and to what extent employment uncertainty interacts with family formation. However, as far as union formation is concerned, the most enduring finding is a negative relationship with unstable employment conditions. Kalmijn (2011) tested Oppenheimer's uncertainty hypothesis with data from several European countries and the results confirmed that employment uncertainty negatively affects union formation among men, especially in traditional contexts characterised by less egalitarian family roles. Other recent studies confirmed that employment instability (either considered as non-employment spells, unemployment, or temporary employment) delays or hampers union formation also among women to different extent in different contexts (Bukodi, 2012, for the UK; Vignoli et al., 2016, for Italy; Bolano & Vignoli, 2021, for Australia; Van Wijk et al., 2021, for the Netherlands). Among the few exceptions, Mogi et al. (2024) found a mostly non-significant relationship between employment uncertainty and union formation in Italy and Japan, but their result only refers to partnership formation (i.e., no cohabitations or marriages). However, empirical findings are somehow more heterogeneous when the outcome of interest is fertility. In a recent meta-analysis on the relationship between employment uncertainty and fertility in Europe by Alderotti et al. (2021), it emerged that unemployment is especially detrimental to men's fertility, while temporary employment negatively affects women's fertility primarily. The authors also suggested that such negative effects became stronger over time, albeit they significantly differed across institutional contexts—with the worst effect on fertility being found in Southern European countries, characterised by familistic welfare states and scarce policy interventions for work/family reconciliation (Barbieri et al., 2015). Notwithstanding the numerous studies addressing the nexus between employment uncertainty and fertility (see Buh, 2023 for a review of the literature), the role of union formation as a potential mediator has been surprisingly neglected.

The interrelation between union formation and fertility

A handful of studies analysed and modelled jointly the processes of union formation and transition to parenthood (Brien et al., 1999, for the US; Baizán et al., 2003, for Spain; Baizán et al. 2004, for Germany and Sweden; Aassve et al., 2006, for Great Britain; Trimarchi & Van Bavel, 2017, for several European countries), proving that the two processes are strongly interrelated. In particular, Aassve et al. (2006) addressed the issue of the interrelationship between family formation processes with special emphasis on the role of employment vs. non-employment in Great Britain, showing that it is strongly related to both union formation and fertility processes among women especially. However, none of the abovementioned studies considered

the type of job contract in the (inter)relationship between union formation and fertility dynamics, which is one of the main objectives of this study.

Among the few studies that gave weight to the role of union formation in the relationship between employment uncertainty and fertility, Miettinen and Jalovaara (2020) used event history (EH) analysis to study the effect of unemployment on the transition to parenthood among Finnish women and men and tested whether their results changed after controlling for union status. As for the transition to motherhood, they found that the negative effect of unemployment becomes positive, after controlling for union status, while the negative effect of inactivity becomes statistically insignificant. The negative effects of unemployment and inactivity on the transition to fatherhood persist after controlling for union status, but they become smaller. Although the change in the coefficient of the variable of interest (in this case, unemployment) could not be explicitly attributed to the inclusion of a new variable (namely, union status) in the model due to problems of rescaling for nonlinear models (Karlson et al., 2012), their results suggest that union status operates as a mediator of the relationship between unemployment and transition to parenthood. Despite the evidence of a mediation effect of union status on the relationship between unemployment and the transition to parenthood, the abovementioned work could not quantify the effect.

Informed by this literature, we posited that union status must be taken into greater consideration when analysing the relationship between employment uncertainty and fertility to disentangle the complex interrelations among processes. While several studies attempted to measure the total effect of employment uncertainty on fertility, in this paper, we move one step forward and rely on mediation analysis techniques to quantify the amount of the effect of employment uncertainty on transition to parenthood mediated by union formation. Moreover, we not only considered employment as opposed to non-employment, but we also accounted for the contract duration (i.e. unlimited time vs. temporary work contracts), which was mostly ignored by previous studies.

The case of Italy

Italy represents a peculiar case study because of the quick rise of uncertainty levels in the labour market and its family formation dynamics. Starting from the 1980s, European labour markets went through a strong process of deregulation, including privatisations and liberalisations, which generated unprecedented levels of structural uncertainty (Blossfeld et al., 2006). In Southern European countries, the deregulation of non-standard employment was partial and targeted (Esping-Andersen and Regini 2000) since it affected almost exclusively labour market entrants while leaving existing work contracts mostly unchanged. Within this context, Italy was not an exception. Starting from the 1990s, several laws were promoted to give impulse to new flexible—but less protective—forms of employment aimed at increasing the labour force by creating additional jobs (e.g. Treu Law, L.196/1997 and Biagi Law, L.30/2003). The targeted labour market deregulation—albeit improving the statistics about occupation—raised the general level

of uncertainty since precarious and cheap employment increased (Barbieri et al., 2015; Cutuli & Guetto, 2013). Between 2002 and 2009, the share of temporary contracts out of total employment increased by 31.9% (compared to 7.5% in the EU in the same years) and further increased by 14.7% between 2009 and 2016 (compared to 5.2% in the EU in the same years; Eurostat, 2019).

The Italian labour market is peculiar for its marked gender inequality still present today. Over the last decades, significant variations have occurred in terms of women's labour force participation, with the rate for women aged 15 and over increasing from about 24.6% in 1961 to 40.7% in 2022, although it is still relatively low compared to European standards (International Labor Organization 2024). Thus far, women's labour force participation remains significantly lower than men's, which was equal to 58.8% in 2022, despite the great effort to reduce the gap, which was still equal to 26.4 percentage points at the dawn of the new millennium (with 61.8% male rate and 35.5% female rate in 1999: International Labor Organization 2024). Furthermore, job precariousness is gendered, with a higher proportion of women employed in professions characterized by higher precariousness and inferior job conditions, including low prestige, lower wages, and fewer responsibilities (Pirani & Salvini, 2015). Overall, household living standards depend on the market performance of men: even in dual-earner couples, women are still the main caregivers and men primarily act as household income providers (Aassve et al., 2015).

The abovementioned adverse labour market-related circumstances were shown to play an important role in shaping family formation dynamics (e.g. Bernardi & Nazio, 2005; Vignoli et al., 2020b) because they delay the already slow process of transition to adulthood of young people (Billari et al., 2002; De Rose et al., 2008). Indeed, young Italians are among the oldest to complete their education, enter the labour market, leave the parental home, enter a union and have a child (Caltabiano & Rosina, 2018). For example, in Italy, the mean age of young adults leaving their parental home is 30.1 years, compared to the European average of 26.2 (Eurostat, 2019). As regards union formation, the mean age at the first marriage has increased remarkably, moving from about 26 in 1991 to almost 32 in 2016. Cohabitations have spreaded among the younger cohorts, while the number of single-person families has roughly doubled over the last 30 years (Istat 2022). Fertility dynamics have also changed over the last decades in Italy. Fertility started to decrease in the country during the 1970s and reached its lowest levels during the early 1990s (Kohler et al., 2002). Although a moderate yet meaningful increase in fertility levels took place in many European countries in the early 2000s (Caltabiano et al., 2009; Goldstein et al., 2009), the 2008–2013 economic recession plunged fertility back to under 1.3 children per woman placing the role of economic uncertainty and job instability at the centre of the current debate on the determinants of the persistent low fertility (Alderotti et al., 2021; Comolli, 2017). In 2022, the mean number of children per woman in Italy was 1.24, among the lowest in Europe. Notably, not only are women having fewer children, fewer women are becoming mothers: among women born in the 1950s, only 11% remained without children, whereas among women born at the end of the 1970s, about 23% were childless (and a further increase is expected for women born in the 1980s; ISTAT, 2020). Also, those who eventually become

mothers, do it at later ages: The mean age at first childbearing was stable around 25–26 years for women born until 1960, and increased among the subsequent cohorts, reaching about 29 years for women born in 1970.

Finally, it should be emphasised that the relentless spread of uncertainty in the Italian labour market during the last decades was embedded in one of the least generous welfare states in Europe. The Italian welfare system provides poor support for young adults and scarce state support for childcare (Bonifazi & Paparusso, 2019; Ferrera, 2003; Saraceno & Keck, 2010). In addition, the Italian welfare occupational model allows access to the (few) welfare rights almost exclusively to individuals with unlimited time working contracts, generating—especially for the most recent cohorts—an unfriendly environment for family formation for young people with a precarious job (Aassve et al., 2002; Scherer, 2009).

Data and methods

We used data from the Families, Social Subjects and Life Cycle Survey (FSS) conducted by ISTAT in 2016. It is the most up-to-date survey available including retrospective information about respondents' occupational, union and fertility histories, with monthly detail. We restricted the sample to individuals born in 1946 or later to reduce the level of heterogeneity due to birth cohort; the youngest cohort included in the survey was born in 1998. We also excluded foreign-born individuals (n = 2027) because the mechanisms linking employment, union and fertility histories may differ depending on their migration background. Finally, we dropped records with missing information concerning the key variables, namely those related to employment spells, type of working contracts and union spells (n = 636). The analytical sample included 8,640 women and 8,747 men aged 18–70 years at the interview date.

We modelled the relationship between employment and transition to parenthood through discrete-time EH analysis (i.e. we used logistic regression models with person-months and standard errors clustered at the individual levels) for men and women, separately. Individuals entered the observation at 16 years of age and exited when (a) they experienced the event of interest (namely, the birth of their first child) or (b) at the interview date or when they reached age 49, whichever occurred first. We chose the age of 49 years as a threshold for women because of biological reasons, and we applied the same limitation to men to maintain homogeneity in the two subsamples. The main explanatory variable was the time-varying employment status combined with the type of job contract, which distinguished between permanent employment, temporary employment (including members of cooperatives, seasonal/occasional collaborations, training/apprenticeship contracts, and employees with a temporary contract), non-employment and self-employment. The mediation variable was union formation, operationalised as the time-varying union status (not in union vs. in union—either cohabitation or marriage). Both employment and union formation were lagged by 9 months in order to represent individuals' situation at the time of the conception of the first child leading to a live birth. To perform the mediation analysis, we relied on the KHB (Karlson–Holm–Breen) method (Karlson et al., 2012). This method allows to accurately assess the effect of employment uncertainty
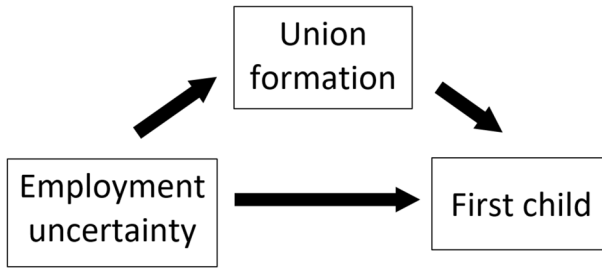
Fig. 1 Mediation analysis scheme

on the transition to parenthood with and without controlling for the mediating variable (i.e. union formation) by making the coefficients comparable across models. The difference between these two effects is due to mediation, and the KHB methods allows to correctly interpret such difference—i.e., net of rescaling. More precisely, we decomposed the total effect of employment uncertainty on the transition to parenthood into its direct and indirect (i.e. mediated by union formation) components (see Fig. 1). The total effect of employment uncertainty on the transition to parenthood was obtained by estimating a discrete-time EH model on the probability of conceiving the first child, controlling for the employment status and all other covariates except the mediating variable (i.e. union formation). The direct effect (i.e., the effect of employment uncertainty on transition to parenthood net of union formation) was obtained by estimating the same model but controlling also for union formation and rescaling the magnitude of the effect size to account for the fact that the two models are different. Finally, the indirect effect is the difference between the total and the direct effect, and it can be interpreted as the portion of the effect of employment uncertainty on the transition to parenthood that is *mediated* or *accounted* for by union formation (e.g., employment uncertainty may delay or impede union formation, consequently delaying or leading to the forfeiture of fertility).

The set of control variables included the following (see Table 3 in the Appendix): the cohort group (1946–1959, 1960–1969, 1970–1998), age group (16–19, 20–24, 25–29, 30–34, 35–39, 40–49), the macro-area of residence (North, Centre, South/Islands), individuals' educational level (still in school or completed education, categorised in lower secondary, upper secondary, tertiary) and parents' highest educational level (either the highest among the two or the only one available, categorised into primary, lower secondary, upper secondary or tertiary). Note that the area of residence was collected at the time of the interview, however, it is relatively safe to use it as a time-constant variable, since Italian internal mobility has been low over recent decades and mainly restricted to short distances (Reynaud & Conti, 2011). All control variables were time-constant, except respondents' ages and educational levels. Finally, given that the labour market deregulation mainly occurred starting from the end of the 1990s—with the Treu Law and Biagi Law—and in line with recent literature on the topic (e.g., Alderotti et al. 2024), we assumed that it had different impacts on the older and younger cohorts. Indeed, the oldest cohort group (1946–1959) was not affected by the labour market deregulation and the new

Table 1 Discrete-time event history model coefficients, by gender

		Ref.: permanent employed	Not employed		Temporary employed		Self-employed
Men	Total effect		−0.743	***	−0.396	***	−0.003
	Direct effect		−0.537	***	−0.267	***	−0.030
	Indirect effect		−0.206 (28%)	***	−0.129 (33%)	***	0.027 (n.r.)
Women	Total effect		−0.045		−0.162	***	−0.016
	Direct effect		−0.032		−0.096	*	−0.037
	Indirect effect		−0.013 (28%)		−0.067 (41%)		0.021 (n.r.)

The models control for cohort group, age group, macro-area of residence, parents' educational level and individual' educational level

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; (n.r.) = not reported

Source: Authors' elaboration on 2016 FSS data

forms of flexible and temporary contracts during the period when union formation and transition to parenthood usually occur, whereas the youngest cohort group (1970–1998) was most affected by this trend. To identify possible differences by birth cohorts, we replicated the analyses separately by cohort groups.

Results

The results of our analyses are displayed in Tables 1–2. In each table, we report the total, direct and indirect/mediated effect of temporary employment and non-employment on the probability of having a first child.[2] In addition, we report in brackets the percentage of the total effect that is mediated by union formation (i.e. the indirect effect over the total effect). The percentage is shown only when the direct and indirect effects have the same sign (to avoid misleading results, e.g. percentages higher than 100% or negative percentages).

Table 1 shows the results from gender-specific models (for the full models, see Table 4 in the Appendix). Among men, both non-employment and temporary employment negatively affect the probability of conceiving a first child. Non-employment has the largest total effect (coefficient: −0.743; corresponding to OR = 0.48). Despite a relevant part of such an effect being indirect (i.e. it passes through union formation, coefficient: −0.206), the remaining direct effect remains large and significant (coefficient: −0.537; OR = 0.59). In other words, union formation mediates about 28% of the effect of non-employment on the probability of having a first child among men. Similarly, temporary employment is related to a lower probability of having a first child (total effect: −0.396; OR = 0.67), with a

---

[2] For space reasons, results about self-employment are reported but not commented as not significant; however, we discuss them in the conclusions.

Table 2 Discrete-time event history model coefficients, by gender and cohorts

		Ref.: permanent employed	Not employed		Temporary employed		Self-employed
Men	1946–1959	Total effect	−0.684	***	−0.453	***	−0.007
		Direct effect	−0.469	***	−0.416	***	−0.038
		Indirect effect	−0.214 (31%)	**	−0.037 (8%)		0.031 (n.r.)
	1960–1969	Total effect	−0.679	***	−0.174		0.026
		Direct effect	−0.475	***	0.033		−0.048
		Indirect effect	−0.204 (30%)	**	−0.207 (n.r.)	**	0.074 (n.r.)
	1970–1998	Total effect	−0.842	***	−0.422	***	0.002
		Direct effect	−0.636	***	−0.289	***	0.018
		Indirect effect	−0.205 (24%)	***	−0.132 (31%)	**	−0.016 (n.r.)
Women	1946–1959	Total effect	0.201	***	−0.048		−0.043
		Direct effect	−0.056		−0.093		0.066
		Indirect effect	0.257 (n.r.)	*	0.045 (n.r.)		−0.109 (n.r.)
	1960–1969	Total effect	−0.039		−0.029		0.073
		Direct effect	0.001		0.005		−0.091
		Indirect effect	−0.04 (10%)		−0.035 (n.r.)		0.164 (n.r.)
	1970–1998	Total effect	−0.095	*	−0.232	***	−0.115
		Direct effect	0.112	*	−0.064		−0.077
		Indirect effect	−0.206 (n.r.)	**	−0.168 (72%)	**	−0.038 (33%)

The models control for age group, macro-area of residence, parents' educational level and individual' educational level

Legend: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; (n.r.) = not reported

Source: Authors' elaboration on 2016 FSS data

direct effect of −0.267 (OR = 0.77) and an indirect effect of −0.129 (OR = 0.88). Union formation mediates about one third of the effect of temporary employment on the probability of transitioning to fatherhood. Among women, the effects at play are generally smaller than among men. Non-employment is slightly negatively related to the transition to motherhood (total effect: −0.045; OR = 0.96), but the results are not statistically significant; nevertheless, women's non-employment seems to be slightly detrimental both for entering into a union and motherhood. The total and direct effects of temporary employment on the probability of having a first child are both negative and significant—even if the direct effect only slightly (coefficients: −0.162 and −0.096; OR = 0.85 and 0.91), but union formation does not significantly mediate the effect (coefficient of the indirect effect: −0.067; OR = 0.94; mediated percentage = 41%).

Direct and indirect effects by cohort group

Table 2 shows results separately by gender and for three cohort groups: 1946–1959, 1960–1969 and 1970–1998 (full models are reported in the Appendix, see Tables 5 and 6). Because we cannot directly compare model coefficients from separate models, in the following our comparison should not be considered in substantial terms; therefore, we concentrate more on the signs of coefficients than on their magnitude. As for men, results suggest that the negative effect of non-employment on the transition to fatherhood seems to be stronger for the most recent cohorts, and that, at the same time, union formation mediates a smaller part of such effect (31% and 30% for the oldest and for the central cohorts vs. 24% for the youngest cohort). Regarding temporary employment, its overall effect seems to be similar for the oldest and the youngest cohorts (coefficients: −0.453 and −0.422; OR = 0.64 and 0.67), but the part mediated by union formation is large and significant only among the youngest cohorts. Concerning women, the effect of non-employment on the transition to motherhood is unsurprisingly positive (and exclusively indirect) among the oldest cohorts, thus reflecting the clear division between male paid work and female unpaid work within the household, whereas becoming negative among the youngest cohorts. However, interestingly, among the 1960–1969 birth cohort and even more among the 1970–1998 birth cohort, the total and the indirect effects are negative (coefficients: −0.095 and −0.206; OR = 0.91 and 0.81 for the latter group), whereas the direct effect is positive (coefficient: 0.112; OR = 1.12). Finally, the effect of temporary employment on the transition to motherhood becomes significantly negative only among the most recent cohort, and it is mostly indirect (total effect: coefficient = −0.232, OR = 0.79; mediated effect: coefficient = −0.168, OR = 0.84).

Conclusions and discussion

Employment uncertainty has emerged as a significant barrier to fertility in high-income countries. Albeit to different extents across national contexts, childbearing mostly takes place within unions; yet, the role of union formation as a mediator of the relationship between employment uncertainty and fertility has received surprisingly little attention. With this study, we tested whether—and, most importantly, to what extent—union formation mediates the effect of employment uncertainty on having a first child for men and women in a low-fertility context as Italy. First, our results indicate that union formation does mediate a substantial part of the relationship between employment and the transition to parenthood. The share of the effect mediated by union formation ranges, on average, between 25 and 40% of the total effect. The mediation effect of union formation is strong especially among men. This suggests that, among Italian men, employment uncertainty not only hampers transition to parenthood by inhibiting childbearing within the couple but also—at an earlier stage—by negatively influencing union formation. In line with the idea that the man's job, within a couple, is the precondition for entering into a union (e.g. Vignoli et al., 2016) and having children in Italy (e.g. Vignoli et al., 2012), our findings are especially visible when male non-employment is considered. In this respect, in Italy,

young men who experience a disadvantage in the occupational sphere experience similar negative effects in the partnership sphere and, consequently, in the parenthood sphere.

Second, the stratified analyses by cohort group suggest different patterns by gender over time. Among men, the direct effect of non-employment and temporary employment on fatherhood is substantial. When non-employment is considered, the mediating role of union formation is slightly weaker for the most-recent cohort. Conversely, the mediating role of union formation for temporary employment matters only for those who have experienced the labour market deregulation (i.e. those born after 1970; e.g. Barbieri et al., 2015; Blossfeld et al., 2006). Presumably, among the older cohort group, temporary employment was perceived just as a temporary condition: before the labour market deregulation, people were mostly confident that a temporary job could become a permanent one, and thus they married even before establishing themselves in the labour market. Among the younger birth cohorts, i.e., those who were most exposed to the consequences of the labour market deregulation, temporary employment entails worse working conditions compared to permanent workers and high uncertainty about future employment and income, which translates into a detrimental effect not only on parenthood but also on their entry into a union.

Among women, the mediating role of union formation becomes significant among the most-recent cohort, both concerning non-employment and temporary employment. Women tend not to enter a union if they are non-employed or employed with a temporary contract, and the resulting indirect effect on the transition to motherhood is larger than the direct effect of non-employment/temporary employment. In this regard, the mediating role of union formation among the most recent birth cohorts of both men and women reflects a shift towards gender equality, indicating an increasing prominence of the dual earner model and a diminishing significance of the male breadwinner model, in line with previous findings about employment and fertility in Italy (see e.g., Alderotti, 2022). Indeed, the direct effect on parenthood of temporary employment becomes non-significant when considering different birth cohorts. While this outcome is unsurprising for women in the oldest cohort, for whom having a job was not a prerequisite for marriage and childbearing, a different scenario emerges for the youngest cohort. Specifically, these women appear to delay entering a stable union until they have attained a certain level of employment security. However, their employment circumstances in the labor market, which are more flexible and less unstable compared to the past, may potentially change. Thus, while acknowledging the importance of employment stability for being in a union, their decision regarding parenthood with either permanent or temporary employment may depend on various factors, such as their partner's job, the opportunity cost of having a child, and the macroeconomic conditions of the labor market. All these factors collectively diminish the significance of employment status once a union is established.

Finally, we acknowledge that, to a certain extent, cohort differences in the association between employment, union formation and fertility may be due to the fact that the age patterns of the events at play have changed across the cohorts considered. Nevertheless, our results imply that the strongest mediation effect by union formation emerges among the most recent cohorts, suggesting that

increased uncertainty in the labour market has modified, in a gendered way, the channels through which employment status affects first childbearing in Italy, i.e., increasingly through an indirect effect mediated by union formation.

This study does not come without limitations. First, the data did not allow us to distinguish non-employment episodes between inactivity and unemployment—and this difference may matter in the framework of our study. In fact, the condition in terms of employment uncertainty of someone who is voluntarily out of the labour force because they do not need to work may differ greatly from that of someone who is looking for a job but cannot find any. However, unemployment and economic inactivity may have similar social and demographic consequences on individuals as far as whether individuals have a job or not; thus, inactivity and unemployment may be equally relevant to fertility (Härkönen, 2011). This may be particularly applicable to men, whereas for women, while it may have been true in the past, it may not necessarily hold for the most recent cohorts, who are more engaged in the labour market. Accordingly, various studies about fertility have already considered non-employment (or joblessness) rather than unemployment (e.g. Alderotti, 2022; Busetta et al., 2019). Moreover, following recent research on fertility (e.g., Köppen et al., 2017; Tocchioni, 2018), we treated the self-employed as a distinct group because they typically differ significantly from employees in terms of job flexibility and the ease of reconciling work with family responsibilities—indeed, the proportion of childless individuals is typically low among the self-employed. Unfortunately, we were unable to detect any effect (either direct or indirect) of self-employment on the transition to parenthood. Most probably, self-employed are a particularly heterogeneous group of workers, and an ad hoc investigation would be necessary to disentangle how their employment status interacts with union formation and fertility. Importantly, we refrain from interpreting our results in a causal manner, because we cannot take into account selection and anticipation mechanisms due to unmeasured factors that may be at play. For example, individuals may enter a union in anticipation of having a child. As a robustness check, we replicated the analyses after excluding individuals who had their first baby before starting a cohabitation or a marriage (about 10% of the sample). The direction of results remains unchanged, while—as expected—the share of the total effect of employment uncertainty on transition to parenthood that is mediated by union formation appears larger than in the analyses showed here. We also acknowledge that the relationship between our independent variable and the mediator (i.e. between employment status and union formation) is not necessarily unidirectional, since union formation may influence employment conditions (e.g. Aassve et al., 2006). For instance, individuals—especially women—may give up working or adjust their working hours after entering into a union in anticipation to having a child. However, evidence for the Italian case suggests that the effect of union formation on employment is not crucial, as most Italian women do not stop working once they have started (Bernardi, 1999; Solera, 2009). Finally, it is important to note that our focus was solely on the transition to parenthood, thus overlooking a portion of the broader picture concerning low fertility in Italy (although the delayed transition to first birth is ultimately linked to family size). Another aspect beyond the paper's analytical

scope, but worth mentioning as a potential extension, is that we solely focused on the immediate effect of employment status on parenthood, without examining the impact of the duration of employment uncertainty (see, for example, Alderotti et al., 2024).

Despite its limitations, this study relies on a strong methodology, which allowed, for the first time, a decomposition of the total effect of employment uncertainty on fertility into its direct and indirect (i.e. mediated by union formation) components and quantified such components with an appropriate approach. Moreover, we also accounted for the contract duration (i.e. unlimited time vs. temporary), which was mostly ignored by previous studies. Given the circumstances, we conclude that union formation mediates a substantial part of the effect of employment uncertainty on fertility in Italy and that the magnitude of such part may change depending on sociodemographic characteristics, such as gender and birth cohort. Moreover, in certain circumstances, the negative effect of employment uncertainty may be exerted only indirectly by hampering union formation (e.g. the effect of non-employment on the transition to motherhood). We, therefore, confirm that union formation is among the chief channels through which employment uncertainty affects fertility. Finally, since our study focuses on the Italian case only, future research should scrutinise whether, and to what extent, the mediating role of union status changes across different European contexts, given the heterogeneity in labour markets' characteristics and in family formation dynamics.

Appendix

See Table 3, 4, 5 and 6.

Table 3 Descriptive statistics

Time-constant variables

	Men		Women	
	N	%	N	%
Cohort				
1946–1959	2474	28.3	2491	28.6
1960–1969	2973	34.0	2949	34.1
1970–1998	3300	37.7	3200	37.3
Macro area				
North	3693	42.2	3691	42.7
Centre	1450	16.6	1407	16.3
South	3604	41.2	3542	41.0
Parental education				
Primary	3849	44.0	3961	45.8
Lower secondary	2642	30.2	2436	28.2
Upper secondary	2114	24.2	2107	24.4
Both missing	142	1.6	136	1.6
Total	8747	100	8640	100

Time-varying variables

	Person-months	Person-months
Age group		
16–19	404,115	388,016
20–24	452,027	378,932
25–29	324,096	233,565
30–34	194,856	128,060
35–39	114,146	74,201
40–49	121,855	89,087
Education		
Still studying	351,740	353,095
Up to lower secondary	538,864	363,944
Upper secondary	591,915	422,064
Tertiary	117,617	142,982
Missing	10,959	9,776
Employment		
Non-employment	608,002	703,635
Temporary employment	117,012	99,228
Self-employment	230,752	79,095
Permanent employment	655,284	409,870
Union status		
Not in union	1,357,779	1,037,723
In union	253,316	254,138

Absolute and percentage frequencies are reported for time-constant variables; exposure time in person-months is reported for time-varying variables

Source Authors' elaboration on 2016 FSS data

Table 4 Discrete-time EHA by gender, with and without control for union status; full models

	Men				Women			
	Without union		With union		Without union		With union	
	OR	p	OR	p	OR	p	OR	p
Cohort (ref. 1946–1959)								
1960–1969	0.65	<0.01	0.76	<0.01	0.68	<0.01	0.78	<0.01
1970–1998	0.46	<0.01	0.66	<0.01	0.51	<0.01	0.68	<0.01
Age (ref. 16–19)								
20–24	4.27	<0.01	2.50	<0.01	2.22	<0.01	1.00	0.96
25–29	9.75	<0.01	2.53	<0.01	3.11	<0.01	0.76	<0.01
30–34	11.44	<0.01	2.16	<0.01	2.81	<0.01	0.57	<0.01
35–39	8.13	<0.01	1.41	0.01	1.54	<0.01	0.32	<0.01
40–49	2.46	<0.01	0.43	<0.01	0.15	<0.01	0.03	<0.01
Macro area (ref. North)								
Center	1.18	<0.01	1.29	<0.01	1.17	<0.01	1.23	<0.01
South	1.46	<0.01	1.65	<0.01	1.13	<0.01	1.50	<0.01
Parental edu (ref. primary)								
Lower secondary	0.96	0.23	0.92	0.07	0.87	<0.01	0.87	0.01
Upper secondary/tertiary	0.80	<0.01	0.75	<0.01	0.79	<0.01	0.81	<0.01
Both missing	0.98	0.85	0.80	0.18	1.05	0.70	0.95	0.73
Respondent's education (ref. Lower secondary)								
Still studying	0.62	<0.01	0.70	<0.01	0.25	<0.01	0.48	<0.01
Upper secondary	0.86	<0.01	0.89	0.01	0.80	<0.01	1.00	0.97
Tertiary	0.90	0.04	1.00	0.96	0.86	0.01	1.08	0.17
Missing	0.68	0.13	0.49	0.06	0.99	0.95	1.16	0.47
Employment status (ref. permanent contract)								
No work	0.39	<0.01	0.58	<0.01	0.95	0.17	0.97	0.44
Temporary contract/atypical work	0.67	<0.01	0.77	<0.01	0.83	0.01	0.91	0.13
Self-employed	0.95	0.18	0.97	0.53	0.98	0.69	0.96	0.56
Union status (ref. not in union)								
In union			19.27	<0.01			20.38	<0.01
Intercept	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01

Source Authors' elaboration on 2016 FSS data

Table 5 Discrete-time EHA by gender and birth cohort, with and without control for union status; full models. Men

| | 1946–1959 | | | | 1960–1969 | | | | 1970–1998 | | | |
| | Without union | | With union | | Without union | | With union | | Without union | | With union | |
	OR	p	OR	p	OR	p	OR	p	OR	p	OR	p
Age (ref. 16–19)												
20–24	6.67	<0.01	2.46	<0.01	4.45	<0.01	2.62	<0.01	1.86	<0.01	1.31	0.09
25–29	13.50	<0.01	2.93	<0.01	11.03	<0.01	2.82	<0.01	5.79	<0.01	2.00	<0.01
30–34	11.15	<0.01	1.89	<0.01	13.73	<0.01	2.56	<0.01	9.67	<0.01	2.21	<0.01
35–39	6.67	<0.01	1.06	0.74	9.78	<0.01	1.66	0.01	8.78	<0.01	1.74	<0.01
40–49	2.41	<0.01	0.38	<0.01	3.05	<0.01	0.53	<0.01	3.54	<0.01	0.72	0.16
Macro area (ref. North)												
Center	1.24	<0.01	1.39	<0.01	1.12	0.15	1.12	0.19	1.11	0.15	1.30	<0.01
South	1.52	<0.01	1.59	<0.01	1.56	<0.01	1.61	<0.01	1.26	<0.01	1.78	<0.01
Parental edu (ref. primary)												
Lower secondary	0.93	0.23	0.90	0.22	0.93	0.28	0.91	0.23	0.99	0.99	0.99	0.84
Upper secondary/tertiary	0.84	0.04	0.85	0.10	0.85	0.04	0.74	<0.01	0.78	<0.01	0.74	<0.01
Both missing	0.90	0.49	0.68	0.08	1.04	0.82	1.02	0.94	1.07	0.83	1.39	0.24
Respondent's education (ref. lower secondary)												
Still studying	0.73	<0.01	0.78	0.03	0.59	<0.01	0.67	<0.01	0.47	<0.01	0.58	<0.01
Upper secondary	0.92	0.11	0.93	0.26	0.81	<0.01	0.83	0.01	0.78	<0.01	0.87	0.04
Tertiary	0.86	0.07	0.87	0.19	0.99	0.92	1.29	0.02	0.80	0.01	0.91	0.34
Missing	0.87	0.67	0.59	0.25	0.39	0.14	0.38	0.31	0.38	0.18	0.39	0.32
Employment (ref. permanent contract)												
No work	0.43	<0.01	0.63	<0.01	0.43	<0.01	0.62	<0.01	0.34	<0.01	0.53	<0.01
Temporary contract / atypical	0.66	<0.01	0.66	<0.01	0.79	0.04	1.03	0.78	0.62	<0.01	0.75	<0.01
Self-employed	0.93	0.23	0.96	0.61	0.99	0.84	0.95	0.53	0.94	0.34	1.02	0.78

Table 5 (continued)

	1946–1959				1960–1969				1970–1998			
	Without union		With union		Without union		With union		Without union		With union	
	OR	p	OR	p	OR	p	OR	p	OR	p	OR	p
Union status (ref. not in union)												
In union			18.24	<0.01			18.85	<0.01			20.02	<0.01
Intercept	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.00	<0.01	0.01	<0.01

Source Authors' elaboration on 2016 FSS data

Table 6 Discrete-time EHA by gender and birth cohort, with and without control for union status; full models. Women

| | 1946–1959 | | | | 1960–1969 | | | | 1970–1998 | | | |
| | Without union | | With union | | Without union | | With union | | Without union | | With union | |
	OR	p	OR	p	OR	p	OR	p	OR	p	OR	p
Age (ref. 16–19)												
20–24	2.46	<0.01	0.99	0.99	2.33	<0.01	1.02	0.84	2.01	<0.01	1.12	0.25
25–29	2.59	<0.01	0.57	<0.01	3.27	<0.01	0.84	0.07	4.38	<0.01	1.23	0.05
30–34	1.45	<0.01	0.29	<0.01	2.85	<0.01	0.64	<0.01	5.45	<0.01	1.15	0.20
35–39	0.64	<0.01	0.13	<0.01	1.71	<0.01	0.39	<0.01	3.61	<0.01	0.77	0.06
40–49	0.05	<0.01	0.01	<0.01	0.21	<0.01	0.05	<0.01	0.65	0.17	0.14	<0.01
Macro area (ref. North)												
Center	1.18	<0.01	1.19	0.03	1.16	0.03	1.23	0.01	1.14	0.05	1.21	<0.01
South	1.08	0.150	1.40	<0.01	1.27	<0.01	1.73	<0.01	1.06	0.29	1.35	<0.01
Parental edu (ref. primary)												
Lower secondary	0.85	0.01	0.90	0.23	0.91	0.13	0.89	0.13	0.90	0.08	0.87	0.04
Upper secondary/tertiary	0.73	<0.01	0.77	0.01	0.81	<0.01	0.90	0.24	0.88	0.05	0.84	0.02
Both missing	0.96	0.80	0.87	0.52	1.02	0.93	1.06	0.83	1.24	0.26	0.99	0.99
Respondent's education (ref. lower secondary)												
Still studying	0.36	<0.01	0.66	<0.01	0.27	<0.01	0.50	<0.01	0.17	<0.01	0.32	<0.01
Upper secondary	0.84	<0.01	1.12	0.11	0.77	<0.01	0.92	0.26	0.75	<0.01	0.91	0.19
Tertiary	1.03	0.75	1.32	0.01	0.91	0.29	1.10	0.36	0.62	<0.01	0.80	0.02
Missing	1.23	0.23	1.15	0.51	0.39	0.09	1.27	0.56	0.34	0.17	1.18	0.79
Employment (ref. permanent contract)												
No work	1.09	0.09	0.95	0.40	0.93	0.280	1.00	0.99	0.89	0.04	1.12	0.07
Temporary contract / atypical	0.81	0.03	0.91	0.42	0.92	0.430	1.00	0.96	0.80	<0.01	0.93	0.43
Self-employed	1.05	0.66	1.07	0.55	1.00	0.970	0.91	0.44	0.90	0.25	0.93	0.48

Table 6 (continued)

| | 1946–1959 | | | | 1960–1969 | | | | 1970–1998 | | | |
| | Without union | | With union | | Without union | | With union | | Without union | | With union | |
	OR	p	OR	p	OR	p	OR	p	OR	p	OR	p
Union status (ref. not in union)												
In union			19.39	<0.01			22.19	<0.01			18.41	<0.01
Intercept	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.00	<0.01

Source Authors' elaboration on 2016 FSS data

Declarations

References

Aassve, A., Billari, F. C., Mazzuco, S., & Ongaro, F. (2002). Leaving home: A comparative analysis of ECHP data. *Journal of European Social Policy, 12*(4), 259–275.

Aassve, A., Burgess, S., Propper, C., & Dickson, M. (2006). Employment, family union and childbearing decisions in Great Britain. *Journal of the Royal Statistical Society: Series A (Statistics in Society), 169*(4), 781–804.

Aassve, A., Fuochi, G., Mencarini, L., & Mendola, D. (2015). What is your couple type? Gender ideology, housework-sharing, and babies. *Demographic Research, 32*(1), 835–858. https://doi.org/10.4054/DemRes.2015.32.30

Ahn, N., & Mira, P. (2002). A note on the changing relationship between fertility and female employment rates in developed countries. *Journal of Population Economics, 15*(4), 667–682.

Alderotti, G., Guetto, R., Barbieri, P., Scherer, S., & Vignoli, D. (2024). Unstable employment careers and (quasi-) completed fertility: evidence from the labour market deregulation in Italy. *European Sociological Review,* jcae027.

Alderotti, G. (2022). Female employment and first childbirth in Italy: What news? *Genus, 78*(1), 1–19.

Alderotti, G., Vignoli, D., Baccini, M., & Matysiak, A. (2021). Employment instability and fertility in Europe: A meta-analysis. *Demography, 58*(3), 871–900.

Baizán, P., Aassve, A., & Billari, F. C. (2003). Cohabitation, marriage, and first birth: The interrelationship of family formation events in Spain. *European Journal of Population/revue Européenne De Démographie, 19*, 147–169.

Baizán, P., Aassve, A., & Billari, F. C. (2004). The interrelations between cohabitation, marriage and first birth in Germany and Sweden. *Population and Environment, 25*, 531–561.

Barbieri, P., Bozzon, R., Scherer, S., Grotti, R., & Lugo, M. (2015). The rise of a Latin model? Family and fertility consequences of employment instability in Italy and Spain. *European Societies, 17*(4), 423–446.

Bernardi, F. (1999). Does the husband matter? Married women and employment in Italy. *European Sociological Review, 15*(3), 285–300.

Bernardi, F., & Nazio, T. (2005). Globalization and the transition to adulthood in Italy. In H.-P. Blossfeld, E. Klizing, M. Mills, & K. Kurz (Eds.), *Globalization, uncertainty and youth in society* (pp. 349–374). London: Routledge.

Billari, F., Castiglioni, M., Castro Martin, T., Michielin, F., & Ongaro, F. (2002). *Household and union formation in a Mediterranean fashion: Italy and Spain*. San Francisco: United Nations.

Blossfeld, H. P., Klijzing, E., Mills, M., & Kurz, K. (2006). *Globalization, uncertainty and youth in society: The losers in a globalizing world*. London: Routledge.

Bolano, D., & Vignoli, D. (2021). Union formation under conditions of uncertainty. *Demographic Research, 45*, 141–186.

Bonifazi, C., & Paparusso, A. (2019). L'impatto delle politiche familiari sulla bassa fecondità europea. *Rivista Delle Politiche Sociali, 4*, 31–49.

Brien, M. J., Lillard, L. A., & Waite, L. J. (1999). Interrelated family-building behaviors: Cohabitation, marriage, and nonmarital conception. *Demography, 36*(4), 535–551.

Buh, B. (2023). Measuring the effect of employment uncertainty on fertility in low-fertility contexts: An overview of existing measures. *Genus, 79*(1), 1–23.

Bukodi, E. (2012). The relationship between work history and partnership formation in cohorts of British men born in 1958 and 1970. *Population Studies, 66*(2), 123–145.

Busetta, A., Mendola, D., & Vignoli, D. (2019). Persistent joblessness and fertility intentions. *Demographic Research, 40*, 185–218.

Caltabiano, M., Castiglioni, M., & Rosina, A. (2009). Lowest-low fertility: Signs of a recovery in Italy? *Demographic Research, 21*, 681–718.

Caltabiano, M., & Rosina, A. (2018). The dejuvenation of the Italian population. *Journal of Modern Italian Studies, 23*(1), 24–40.

Comolli, C. L. (2017). The fertility response to the Great Recession in Europe and the United States: Structural economic conditions and perceived economic uncertainty. *Demographic Research, 36*, 1549–1600.

Cutuli, G., & Guetto, R. (2013). Fixed-term contracts, economic conjuncture, and training opportunities: A comparative analysis across European labour markets. *European Sociological Review, 29*(3), 616–629.

De Rose, A., Racioppi, F., & Zanatta, A. L. (2008). Italy: Delayed adaptation of social institutions to changes in family behaviour. *Demographic Research, 19*, 665–704.

Esping-Andersen, G., & Regini, M. (Eds.). (2000). *Why deregulate labour markets?* Oxford: OUP.

Eurostat. (2019). Employment statistics. https://ec.europa.eu/.

Ferrera, M. (2003). Reconstructing the welfare state in Southern Europe. In: *The survival of the European welfare state* (pp. 184–200). London: Routledge.

Friedman, D., Hechter, M., & Kanazawa, S. (1994). A theory of the value of children. *Demography, 31*, 375–401.

Goldstein, J. R., Sobotka, T., & Jasilioniene, A. (2009). The end of "lowest-low" fertility? *Population and Development Review, 35*(4), 663–699.

Härkönen, J. (2011). Children and dual worklessness in Europe: A comparison of nine countries. *European Journal of Population/revue Européenne De Démographie, 27*(2), 217–241.

International Labour Organization. (2024). "ILO Modelled Estimates and Projections database (ILOEST)" ILOSTAT. Accessed February 06, 2024. https://ilostat.ilo.org/data/

Istat. (2020). Natalità e Fecondità della Popolazione Residente, Anno 2019, Statistiche Report, Roma, ISTAT.

Istat. (2022). Censimento permanente della popolazione: Le famiglie in Italia. Anni 2018 e 2019. Roma, ISTAT.

Kalmijn, M. (2011). The influence of men's income and employment on marriage and cohabitation: Testing Oppenheimer's theory in Europe. *European Journal of Population/revue Européenne De Démographie, 27*(3), 269–293.

Karlson, K. B., Holm, A., & Breen, R. (2012). Comparing regression coefficients between same-sample nested models using logit and probit: A new method. *Sociological Methodology, 42*(1), 286–313.

Kohler, H. P., Billari, F. C., & Ortega, J. A. (2002). The emergence of lowest-low fertility in Europe during the 1990s. *Population and Development Review, 28*(4), 641–680.

Köppen, K., Mazuy, M., & Toulemon, L. (2017). Childlessness in France. In M. Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Contexts, causes, and consequences* (pp. 77–95). Cham: Springer.

Miettinen, A., & Jalovaara, M. (2020). Unemployment delays first birth but not for all. Life stage and educational differences in the effects of employment uncertainty on first births. *Advances in Life Course Research*, *43*, 100320.

Mills, M., & Blossfeld, H. P. (2013). *The second demographic transition meets globalization: A comprehensive theory to understand changes in family formation in an era of rising uncertainty* (pp. 9–33). Springer.

Mogi, R., Mugiyama, R., & Alderotti, G. (2024). Employment conditions and non-coresidential partnership in very-low fertility countries: Italy and Japan. *Journal of Family Research*, *36*, 160–177.

Neuberger, F., Rüttenauer, T., & Bujard, M. (2022). Where does public childcare boost female labor force participation? Exploring geographical heterogeneity across Germany 2007–2017. *Demographic Research, 46*, 693–722.

Neyer, G., Lappegård, T., & Vignoli, D. (2013). Gender Equality and Fertility: Which Equality Matters? Egalité de genre et fécondité: De quelle égalité s' agit-il? *European Journal of Population/revue Européenne De Démographie, 29*, 245–272.

Oppenheimer, V. K. (1994). Women's rising employment and the future of the family in industrial societies. *Population and development review*, 293–342.

Oppenheimer, V. K. (1988). A theory of marriage timing. *American Journal of Sociology, 94*(3), 563–591.

Perelli-Harris, B., Kreyenfeld, M., Sigle-Rushton, W., Keizer, R., Lappegård, T., Jasilioniene, A., ... & Di Giulio, P. (2012). Changes in union status during the transition to parenthood in eleven European countries, 1970s to early 2000s. *Population studies*, *66*(2), 167–182.

Pirani, E., & Salvini, S. (2015). Is temporary employment damaging to health? A longitudinal study on Italian workers. *Social Science & Medicine, 124*, 121–131. https://doi.org/10.1016/j.socscimed.2014.11.033

Raybould, A., & Sear, R. (2021). Children of the (gender) revolution: A theoretical and empirical synthesis of how gendered division of labour influences fertility. *Population Studies, 75*(2), 169–190.

Reynaud, C., & Conti, C. (2011). Mobilità della popolazione, immigrazione e presenza straniera. *Rapporto Sulla Popolazione. L'italia a, 150*, 97–118.

Saraceno, C., & Keck, W. (2010). Can we identify intergenerational policy regimes in Europe? *European Societies, 12*(5), 675–696.

Scherer, S. (2009). The social consequences of insecure jobs. *Social Indicators Research, 93*(3), 527–547.

Solera, C. (2009). Combining marriage and children with paid work: Changes across cohorts in Italy and Britain. *Journal of Comparative Family Studies, 40*(4), 635–659.

Standing, G. (2014). *The Precariat-the New Dangerous Class. Amalgam, 6*(6–7), 115–119.

Tocchioni, V. (2018). Exploring the childless universe: Profiles of women and men without children in Italy. *Demographic Research, 38*, 451–470.

Trimarchi, A., & Van Bavel, J. (2017). Education and the transition to fatherhood: The role of selection into union. *Demography, 54*(1), 119–144.

Van Wijk, D. C., de Valk, H. A., & Liefbroer, A. C. (2021). Temporary employment and family formation: An income or insecurity effect? *European Sociological Review, 37*(4), 641–658.

Vignoli, D., Drefahl, S., & De Santis, G. (2012). Whose job instability affects the likelihood of becoming a parent in Italy? A tale of two partners. *Demographic Research, 26*, 41–62.

Vignoli, D., Guetto, R., Bazzani, G., Pirani, E., & Minello, A. (2020a). A reflection on economic uncertainty and fertility in Europe: The Narrative Framework. *Genus, 76*(1), 1–27.

Vignoli, D., Tocchioni, V., & Mattei, A. (2020b). The impact of job uncertainty on first-birth postponement. *Advances in Life Course Research, 45*, 100308.

Vignoli, D., Tocchioni, V., & Salvini, S. (2016). Uncertain lives: Insights into the role of job precariousness in union formation in Italy. *Demographic Research, 35*, 253–282.