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The unequal childbearing response to labor market uncertainty in Europe: the role of social location, between macro and micro effects

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Abstract
The study proposes a novel perspective in analyzing the nexus between labor market uncertainty and childbearing behavior, namely the full consideration of the meso-level, or social location. We claim that a comprehensive understanding of the role of employment uncertainty must include, together with the more traditional micro- and macro-levels, the social location's exposure to uncertainty. We use the 2004–2023 rounds of the European Social Survey (ESS) to investigate the association between the employment uncertainty experienced by the respondents through their social location (i.e., unemployment in their ascribed reference group) and national context (i.e., country annual unemployment rate), net of and in interaction with the labor market uncertainty experienced by them at the individual level. We run separate analyses for men and women, and we investigate whether and how this process depends on the respondents' socioeconomic status. Our findings show that, per se, the employment uncertainty experienced in one's social location and country context is not substantially associated with the probability of having a child; on the other hand, as unemployment rates increase in the social location or country, the likelihood of having a child declines among individuals who never experienced labor market uncertainty, making them more similar to those who did experience personally some degree of uncertainty.

Keywords Childbearing, Employment uncertainty, Inequality, Reference group, Social location

Introduction

Existing studies linking childbearing behavior to economic or labor market uncertainty tend to conceptualize the latter as either an exclusively micro- or macro-level phenomenon. In this study, we argue that an overlooked but crucial level of exposure to uncertainty is the meso-level. Individuals' life course decisions are driven by agency (individual choices and actions), and they are also influenced by the characteristics of the place they live in. Yet, men and women are also embedded in and affected by a meso-context—i.e., the attributes, situation, and destiny of social or reference groups that are characterized by a common location in the historical dimension of the social process (Mannheim,

1952). The social location may, therefore, represent an additional channel through which economic or labor market uncertainty influences individuals' reproductive behavior.

Before discussing the role of micro, macro, and meso-level factors, however, a clarification is needed on the utilization of the concept of "uncertainty", and particularly its application to the specific domain under study here, i.e., employment. The utilization of the concept has been quite heterogeneous in the literature, depending on the level of the analysis and determinants considered, as well as the specific field of study–i.e., economics, sociology, or demography. Demographers have often conceptualized employment uncertainty as the condition affecting those who have experienced a precarious or discontinuous connection with the paid labor market, and/or who expect to experience such a condition in the future (Vignoli et al., 2020b). Sociological studies of the labor market, instead, have often distinguished concepts such as "instability", "insecurity", or "precarity", referring to the individual's experience of unemployment or to the fact of having an intermittent career or a temporary contract,[1] using the term "uncertainty" only to refer specifically to future expectations.

In this article, we follow existing demographic studies and use the concept of "employment uncertainty" as an umbrella concept. Mirroring the approach championed by Amartya Sen in the field of inequality studies, we suggest that the relevant question is "uncertainty of what?". We conceptualize uncertainty as the status in which individuals find their short- and long-term expected employment conditions more difficult to predict because either (i) their past or current attachment to the labor market is uncertain, unstable, or insecure, or (ii) the macro- or meso-level conditions observed by the individuals via anecdotal and everyday experience signals that their future labor market circumstances will become more uncertain, unstable, or insecure. We return to this conceptualization issue in the Discussion section.

Against this backdrop, our contribution to the literature is to conceptualize and empirically investigate the nexus between employment uncertainty and fertility behavior as a three-channel experience involving individual life histories (micro), the national context individuals live in (macro), and the social location they inhabit (meso). While the first two channels have been the subject of numerous studies–the majority of which focus on the micro-level link between employment uncertainty and childbearing, but also a few investigating how macro-level employment uncertainty influences individual-level fertility–the introduction of the experience of employment uncertainty at the meso-level is entirely new.

We think that the exclusive focus on the micro and macro perspectives risks overlooking the role that social groups exercise in affecting individuals' attitudes, intentions, and behavior regarding parenthood (Balbo et al., 2014; Bernardi and Klarner, 2014). We expect that, similarly to what has been argued regarding the macro-level context (Comolli, 2021a, b; 2023), the reference groups' conditions, as perceived by individuals via anecdotal experiences in their social locations, shape the individual's perception of the level of unpredictability characterizing their near-future labor market context, over and above the perceptions based on their individual past and present conditions.

Furthermore, we argue that these three levels (macro, meso, and micro) are deeply intertwined. Because uncertainty is generated and felt across multiple dimensions,

[1] These concepts have been utilized extensively in studies of labor market deregulation and atypical employment (Esping-Andersen & Regini, 2000; Korpi & Levin, 2001; Scherer, 2009).

individuals' (childbearing) responses to their employment uncertainty hinge on their social environment and the wider national context. What people view as an acceptable level of employment uncertainty before deciding to have (additional) children is shaped by their context (Glavin et al., 2020). At the same time, never having faced employment uncertainty may matter less and less for childbearing choices when broader conditions paint a grim picture of the future.

Finally, while most previous studies have focused on "average effects" of uncertainty on fertility, growing inequalities have been driving a wedge between those who manage to reach their intended family size and those who do not (Mencarini et al., 2018). The population average relationship between labor market uncertainty and fertility behavior may mask important group heterogeneities, with women versus men, and low versus high socioeconomic status individuals affected differently by different dimensions of uncertainty. Our study sheds light on such under-researched stratification mechanisms.

We exploit the richness of the European Social Survey (ESS) in terms of both the number of countries and years covered (30 countries observed from 2004 to 2023 in our study) and apply linear probability models to investigate the extent to which men's and women's probability of having a(nother) child depends on the exposure to employment uncertainty at the individual, social location, and national level, their cross-levels interactions, and their heterogeneous effects by socioeconomic status.

Background

Employment uncertainty and fertility: the micro and macro perspectives

Several theories have been proposed to explain the nexus between labor market uncertainty and fertility. The vast majority of the approaches focus on the individual's agency and employment uncertainty as a micro-level determinant of childbearing. Traditional family economic models see childbearing as a rational choice based on the costs and benefits of children and posit that the decline in household income following unemployment spells leads to childbearing postponement (Becker, 1993). The experience of unemployment, especially if prolonged, is not only followed by a short-term income loss, but it also makes medium-to-long-term employment prospects and future income stability more uncertain. Secure employment is also often seen as a normative precondition to start or enlarge a family (Becker, 1993; Kreyenfeld, 2010). With rising uncertainty about future labor market attachment, long-term commitments such as housing purchases, marriages, and childbearing tend to be postponed to more secure times (Manning et al., 2022; Mills & Blossfeld, 2005; Ranjan, 1999).

The more recent literature on *Uncertainty Demography* (Trinitapoli, 2023) focuses, conceptually and empirically, more on the role of subjective perceptions of current and future expectations in shaping childbearing decisions (Vignoli et al., 2020a, 2020b).[2] In this perspective, employment uncertainty is often measured using respondents' perceived job security (Kreyenfeld, 2010; Trinitapoli & Yeatman, 2011; Vignoli et al., 2020c). Yet, perceptions of labor market uncertainty can also be understood as being generated by contextual conditions since the latter offer individuals a signal of what they can expect

[2] The Narrative Framework, recently applied in the field of demography and fertility decisions, emphasizes the role of time to distinguish the objective and subjective dimensions of economic and employment prospects, to define uncertainty. In this framework, objective conditions represent the "shadow of the past", while subjective conditions represent "imagined futures" or "shadows of the future" (Bernardi et al., 2019: 4), and subjective perceptions influence fertility behavior as much as objective conditions (Vignoli et al., 2020a: 26).

from future employment prospects in the area they live in (Clark et al., 2010; Comolli, 2021a, b, 2023; Kreyenfeld et al., 2012; Sobotka et al., 2011; Yu & Sun, 2018).

Especially through the media narrative exposure and news coverage, citizens become informed about the current economic and labor market situation of their country, and, through that narrative, they become more or less exposed to contextual employment uncertainty (Comolli & Vignoli, 2021; Guetto et al., 2023). Hence, *uncertainty can be contextually constructed*. The economics and social psychology literature shows, for instance, that aggregate unemployment has effects on the well-being of both those who experience joblessness and those who do not (Clark et al., 2010). Both those who have a job and those who don't suffer from rising rates of unemployment because it signals an increasing risk of becoming unemployed themselves, or remaining jobless for longer (Witte, 1999). Furthermore, when the labor market is highly uncertain, employees tend to feel pressure to commit to their job for fear of losing it, rather than embarking on family commitments (Clark et al., 2010). In a similar vein, men's and women's childbearing decisions, independently of their current employment status and past experiences, are influenced by the degree of labor market uncertainty in the place they live and work (Comolli, 2023; Guetto et al., 2023).

The evidence on the nexus between employment uncertainty, whether individually or contextually measured, and childbearing is robust. At the micro-level, labor market uncertainty is significantly related to fertility intentions in Europe (Comolli, 2023; Fahlén & Oláh, 2018; Lappegård et al., 2022; Novelli et al., 2021; Testa & Basten, 2014) and in the US (Brauner-Otto & Geist, 2018). Several studies also find a significant association between employment uncertainty and fertility behavior, at least for specific subgroups or contexts, and with usually stronger effects for men than women (Alderotti et al., 2021; Bhaumik & Nugent, 2011; Glavin et al. 2020; Hanappi et al., 2017; Kreyenfeld, 2010; Pailhe and Solaz, 2012). Finally, a few studies offer evidence of a significant effect of changing contextual conditions on individuals' fertility intentions (Comolli, 2023) and behavior (Ayllón, 2019; Comolli, 2021a, b; Hofmann & Hohmeyer, 2013). Different from individual-level labor market uncertainty, aggregate unemployment rates tend to be similarly associated with childbearing probability for men and women (Kravdal, 2002), although differences may emerge when considering socioeconomic status (Yu & Sun, 2018), as will be discussed in Sect. "Heterogeneous effects: gender and education.

Employment uncertainty and fertility: the meso perspective

In contrast to the macro-level context, defined as any attribute "aggregated to some level within a geographic hierarchy" (Voss, 2007:459), by meso-level context, we mean attributes of reference groups, namely aggregations of persons characterized by a common identity, culture, and shared social relationships (Fine, 2012). Individuals do not live and make decisions in isolation but are embedded in a social context, namely in structures of social interaction influencing individual beliefs and actions, including reproductive decisions (Balbo et al., 2013; Balbo & Barban, 2014; Bernardi and Klarner, 2014; Elder, 1974; 1998; Entwisle, 2007; Huinink & Kohli, 2014). Individuals use social interactions as a resource to navigate complex situations (Rossier & Bernardi, 2009), and community actions serve as an important information set from which individuals choose their course of action (Montgomery & Casterline, 1996). The information and the anecdotal

evidence derived from the reference groups, frame, affect, and re-address signals coming from macro-level conditions and micro-level contingent situations.

Borrowing the concept from the classic work of Mannheim on generations (1952), we suggest that, from the perspective of the individual, the meso-level can be proxied by the cumulative and simultaneous individual's membership in multiple specific "location(s)" (*lagerung*). In other words, we argue that meso-level employment uncertainty is understood and perceived by individuals through their (anecdotal) knowledge and empirical evidence of the labor market situation of people with whom they share a common location within the social structure. Membership in a location does not depend on an individual's will or consciousness, nor is it binding as membership into a community; it is, however, an objective fact, even if unconscious. Individuals who share the same location(s) along different dimensions of the social structure have a common position in the historical dimension of social processes (e.g., birth cohorts) and similar material conditions (e.g., gender, migration status, educational level).

As argued above, the relevance of such locations for an individual's perception and experience of uncertainty stems from the existence of social interaction between human beings, besides that taking place within the family network or local community. Thus, for instance, belonging to the same location in terms of birth cohort endows individuals with a specific range of historically determined experiences of labor market uncertainty, that, even when they are not directly experienced at the individual level, they are perceived through social interaction with other members of the same location. Similarly to the contextual experience of employment uncertainty, the social experience of job uncertainty in one's reference group signals the increasing likelihood of future experience of employment uncertainty, net of individual-level employment status and past experiences. Hence, *uncertainty can be socially constructed*.

While very recent studies within the life course paradigm advocate for a more comprehensive conceptualization of the life course which includes individuals' social location, together with locating them in time and space (Fasang et al., 2024), the conceptualization of uncertainty as a multidimensional (micro, meso, and macro) experience and the consequences of such conceptualization for the study of its effects on fertility are, to our knowledge, inexistent.

Employment uncertainty and fertility: cross-level interactions

Social psychology theories (e.g., the social comparison theory and the stress process model, Pearlin, 1999) posit that people use groups or social aggregates as standards or frames of reference when evaluating their abilities, attitudes, or beliefs (Hyman, 1960). Experiences of uncertainty, in particular, prompt individuals to anchor their evaluations to contextual norms, shaping the perceived significance of such experiences (Darley & Latané, 1968). Evidence from stress research shows that the health consequences of unemployment are amplified when it is atypical within one's social context and mitigated when viewed as common or normative (Clark, 2003). Shared exposure to job insecurity within a context tends to attenuate adverse outcomes (Glavin and Young, 2020; Young & Wheaton, 2013). Being unemployed when all your peers are employed may have more negative consequences compared to being jobless around many others in the same condition, while being securely employed may look a lot less secure if most peers lost their jobs (Clark, 2003). Similar contextual effects were recently documented regarding the

effect of children's unemployment on parents' psychological wellbeing, showing that the negative effects of job loss are larger in the context of increasing national unemployment levels (Albertini & Piccitto, 2023).

The evaluation of one's labor market uncertainty and the childbearing responses to that, thus, may depend on how the individual fares relative to the rest of the people in her spatial or social location. We can therefore hypothesize that the different levels of exposure to employment uncertainty interact, reciprocally amplifying or withering their role. On the one hand, the perception of what constitutes an acceptable level of employment uncertainty as a precondition for parenthood is shaped by the surrounding national and social group context. On the other hand, never having experienced employment uncertainty may become progressively less decisive for childbearing decisions if the broader circumstances point to a very bleak future.

While, as mentioned, there are no studies on how the meso-level experience of employment uncertainty influences fertility, a few analyses investigate the interplay between the individual and the aggregated levels, with mixed findings. Some studies in the US and Canada show an attenuation effect of state or regional unemployment rates on the negative association between individuals' or couples' employment uncertainty and childbirth chances (Comolli, 2021a, b; Glavin et al., 2020). Other studies in Europe, however, find that aggregate and individual-level employment uncertainty do not interact in their influence on childbearing (de Lange et al., 2014 for the Netherlands).

Heterogeneous effects: gender and education

The traditional family economic models assume gender specialization in couples, with men in paid work and women in unpaid work. This assumption implies that labor market uncertainty has gendered effects: stronger for men and weaker (or possibly positive) for women. According to Oppenheimer's uncertainty hypothesis, uncertain employment primarily threatens men's breadwinning capability, reducing their chances of partnering and parenthood. However, when both female labor force participation and employment uncertainty are high, the dependence on only one income might be viewed as more vulnerable and less appropriate to parenthood (Oppenheimer, 1988). In contemporary societies, one can argue that with the spreading of gender equality norms, growing female labor force participation and reconciliation policies, and the increasing income prerequisites for parenthood, women's employment uncertainty would be associated with postponed childbearing more and more similarly to men. Yet, the most recent evidence is mixed and dependent on the level of analysis. Overall, it seems that individual-level employment uncertainty negatively influences childbearing for both men and women, but with stronger negative associations for men than women, especially when using unemployment as an indicator. In contrast, aggregate labor market uncertainty, measured via local unemployment rates, tends to influence men's and women's childbearing behavior equally (Alderotti et al., 2021; Comolli, 2021a, b; Esping-Andersen & Billari, 2015; Kravdal, 2002; van Wijk & Billari, 2024; Yu & Sun, 2018).

Previous studies find instead that gender differences exist in the response to the individual-contextual interplay of employment uncertainty. Contextual employment conditions seem to attenuate the negative consequences of individual unemployment (or to have no effect, Oesch & Lipps, 2013) on the well-being of men but not of women, for whom a multiplicative negative effect is found (Clark, 2003; Clark et al., 2010; Oesch

& Lipps, 2013). Comolli (2021a, b) finds similar gender differences in a study of how state unemployment moderates the association between men's and women's occupational mobility and the transition to the first child in the United States: an attenuation of the differences in the risk of fatherhood between men in upwardly and downwardly mobile occupations, while differences among women are accentuated with rising state unemployment.

Men and women are also endowed with heterogeneous amounts of socioeconomic resources, via their parents. Social origin structures individuals' biographies and largely determines life course constraints and opportunities (Diewald & Mayer, 2009; Elder, 1998). On the one hand, through such strong path-dependency, lower resources "reduce biographical uncertainties by limiting the universe of possible life course options to a feasible set of opportunities" (Kreyenfeld and Adersson, 2014: 62), thus restricting individuals' capability set (Sen, 1985, 1992). For instance, at least in contexts with lower labor market protections, economically disadvantaged women more often have children in precarious employment conditions, using motherhood as a way to structure and give meaning to their life course (Friedman et al., 1994). On the other hand, men and women with lower resources are exposed to greater uncertainty through their entire life course (Adsera & Menendez, 2011; Doku et al., 2019; Miettinen & Jalovaara, 2020; OECD, 2010), while high socioeconomic origin shelters individuals from experiencing fierce economic uncertainty (Majamaa, 2015).

Theoretically, not only does the probability of experiencing individual, social, and contextual economic uncertainty differ across socioeconomic groups, but such experience may also operate with different intensity and produce heterogeneous consequences for childbearing behavior. Specialization strategies where the female partner devotes her time to (re)production in the household (i.e., unpaid care work) and the male partner to paid work may be less appealing for highly educated women, who expect to find well-paying jobs in the labor market. For these women, long absences from the labor market are also likely to be more costly than for less educated women, and consequently, unemployment followed by maternity leave is a less attractive option. In contrast, entry into parenthood during unemployment could be a feasible strategy for less educated women who face poorer chances of finding a new job anyhow, at least where the entry and exit from the labor market is relatively smooth (Del Bono et al., 2012; Sayer et al., 2004; Spéder & Kapitány, 2009).

From a theoretical standpoint, we can argue that low educational attainment —more frequently accompanied by employment uncertainty compared to high education — may function as a normalizer of disadvantage or, as termed by Glavin et al. (2020), a contingency that diminishes the salience of experiencing labor market uncertainty. In other words, the social norm to work may already be weaker for the lower educated; hence, the possible attenuation effect may be stronger among them compared to the highly educated.

The results from the studies addressing socioeconomic heterogeneity in the nexus between economic uncertainty and childbearing are mixed. For the United States, some results suggest more negative effects for socioeconomically disadvantaged groups during recessions (Dehejia & Lleras-Muney, 2004; Schneider & Hastings, 2015) while others find reduced fertility among more educated women (Adsera & Menendez, 2011; Yu & Sun, 2018). Some studies in the United States further show socioeconomic

heterogeneities in the reaction to aggregate and individual-level employment: contrary to the more privileged, disadvantaged young adults delay childbearing more in response to local unemployment than to their own (Yu & Sun, 2018). The evidence on Europe is highly context dependent. Comolli et al. (2021) illustrate a relatively homogeneous negative fertility response to the Great Recession across education groups in the Nordic countries. Pailhé and Solaz (2012) find that lower-educated unemployed men (but not women) tend to postpone becoming fathers. In contrast, Kreyenfeld and Andersson (2014) for Denmark and Germany, Wood and Neels (2017) for Belgium, and Huttunen and Kellokumpu (2016) and Miettinen and Jalovaara (2020) for Finland find that highly (but not lowly) educated women responded to unemployment by postponing (or rejecting) entry into parenthood.

Research questions and hypotheses

Our conceptual framework of the nexus fertility-employment uncertainty is multidimensional insofar it conceives three channels–the micro, meso- and macro-level–through which the experience of labor market uncertainty occurs and influences childbearing. Men and women possess a perception of their employment uncertainty, at a given point in time, based on their individual experience. But men and women also anticipate their future employment prospects based on the level of labor market uncertainty they experience via their reference group (social location) and via the context they live in (country).

Our first research question asks: *How does the exposure to micro-, meso- and macro-level employment uncertainty affect men's and women's childbearing?* Here, in line with previous findings, first, we expect to find that individual-level employment uncertainty is negatively related to childbearing for both men and women (H1a), yet, in light of existing evidence, we hypothesize a stronger negative association for men than women (H1b). Second, we hypothesize that both macro- and meso-level uncertainty signals that the likelihood of experiencing unemployment in the future increases; therefore, we suggest they are both negatively associated with childbearing (H2a). Based on previous studies that found no substantial difference across genders of the effect of local unemployment rates on childbirth probability, we hypothesize equally negative effects for men and women of macro- and meso-level uncertainty (H2b).

Moreover, we argue that individuals evaluate their perception of uncertainty based on how well they fare compared to others. Therefore, our second research question asks: *How does the interaction of multiple levels of uncertainty influence childbearing?* Here, in line with the social comparison theory and previous findings, we hypothesize that, for men, both the social and national-level uncertainty attenuate the negative role of individually experienced employment uncertainty on childbearing, hence reducing the differences between groups of high versus low labor market uncertainty (H3a). For women, in line with previous studies on the moderating effect of aggregate unemployment on well-being in Europe and on first birth transition in the US, we expect instead a multiplicative negative effect of meso- and macro-level uncertainty on micro-level employment uncertainty (H3b).

Finally, we investigate the (potentially) heterogeneous effects of uncertainty by socioeconomic status. In particular, we ask: *How does the exposure to micro-, meso-, and macro-level economic uncertainty and their interaction affect individuals' childbearing behavior with different socioeconomic statuses?* In line with the theoretical background

and previous studies, we expect lower socioeconomic status to act as a 'normalizer of the disadvantage' and hence to attenuate the role of employment uncertainty on childbearing probability at all levels (H4a). Based on existing evidence, we hypothesize a stronger normalization effect of lower socioeconomic status on women than men (H4b).

Data and method

Data and analytic sample

We use ten rounds of the European Social Survey (ESS 2004–2023)[3] to test our hypotheses. The ESS is a biannual cross-sectional and cross-national survey representative of the European population aged 15 years or older residing in each of the 39 participating countries. We exploit the richness of the ESS in terms of the number of countries and years covered to investigate how the probability of having a child depends on the exposure to economic uncertainty at the individual, social location, and national levels.

Data from countries with less than three nonconsecutive rounds of participation in the ESS have been excluded from our analytical sample due to the impossibility of reconstructing lagged macro- and meso-level indicators. This selection leads to a sample comprising data from 30 countries[4] and 402,876 individuals (from the initial 488,352). From these we dropped missing observations in key variables necessary to calculate reference groups' employment uncertainty,[5] and then we selected our analytical sample by keeping only men and women in post-education childbearing ages (25–40), getting to a sample of 93,008 respondents. After dropping missing observations in other key variables,[6] we ended up with an analytic sample of 79,295 individuals (52.12% women, N = 41,328), with interview years from 2004 and 2024.[7] We use analytic weights, combining population size weights with post-stratification weights, which are generally recommended in the case of cross-country multiple-round analyses (Kaminska, 2020).

Variables and method

Dependent variable

We created the dependent variable, childbirth, as a binary outcome equal to 1 when respondents have a child below age 2 in the household. We computed the child's age based on the information on the year of birth of each household roster component and the year of the interview. The variable thus captures whether respondents had a child between the current and the previous round of data collection in the country. Around 11% of the men and 12.5% of the women have a newborn (child age < 2) residing in the household at the date of the interview (see Table 1 for descriptive statistics).

It is worth noting that since the information is based on the household roster given by the respondent, we may miss any eventual child who does not live in the household. This

[3] Due to the different coding of key variables, we cannot use the first round of ESS interview (2002).

[4] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Switzerland, Germany, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Montenegro, Netherlands, Norway, Poland, Portugal, Serbia, Sweden, Slovenia, Slovakia, Ukraine, United Kingdom.

[5] Missing observations: 327 in the interview year, 617 in gender, 2800 in education, 459 in migration status.

[6] Missing observations: 358 in the dependent variable, childbirth, 8566 due to the lag of the meso-level economic uncertainty variable.

[7] In each ESS round, most of the interviews (in 50–80% of cases) take place during the year of reference of the round (i.e. 2006 for the 2006 ESS round) but interviews may (in 20–50% of cases) take place during the subsequent calendar year, and in extremely rare cases (< 1.5% of observations in three rounds) during the next calendar year. During the Covid-19 pandemic, only 1.5% of interviews took place in 2020, 72% took place in 2021 and the remaining 26% of the interviews took place in 2022.

Table 1 Descriptive statistics (N = 79,295). Weighted distributions. Source: Authors' elaboration based on ESS (2004–2023) data. Note: Due to the necessity to lag variables to the previous round of data collection, we cannot use the information on childbirth from respondents in the 2004 round of ESS, but it is used to construct lagged reference group unemployment

	Men					Women				
	N	Mean/%	SD	Min	Max	N	Mean/%	SD	Min	Max
Country Unemployment rate % [Micro]	37,967	7.83	3.94	2.10	25.45	41,328	7.78	3.83	2.10	25.45
Ref. Group % Unemployed [Meso]	37,967	6.85	1.29	4.44	12.59	41,328	6.63	1.21	4.37	12.31
Labor market uncertainty [Micro]										
None	24,450.93	61.49				23,935.21	60.55			
Some in the past	4,961.08	12.48				4,291.11	10.86			
Some recent	4,853.46	12.21				4,778.12	12.09			
High in the past	1,699.38	4.27				1,883.56	4.76			
High recent	3,801.05	9.56				4,641.10	11.74			
Age	37,967	32.94	4.54	25	40	41,328	33.00	4.54	25	40
Birth cohort										
1959–1969	1,629.28	4.10				1,729.98	4.38			
1970–1979	13,367.42	33.62				13,411.14	33.93			
1980–1989	18,822.61	47.33				18,248.16	46.16			
1990–1999	5,946.60	14.95				6,139.81	15.53			
Education										
Lower Secondary or Less–ISCED 0–2	7,144.41	17.97				5,574.04	14.10			
Upper Secondary–ISCED 3	14,629.39	36.79				12,529.96	31.70			
Post-Secondary non tertiary–ISCED 4	5,324.26	13.39				5,645.08	14.28			
Tertiary–ISCED 5–6	12,667.85	31.86				15,780.01	39.92			
Migration status										
Native	34,213.28	86.04				34,037.78	86.11			
Migrant	5,552.63	13.96				5,491.31	13.89			
Childbirth										
No childbirth in the past two years	35,384.39	88.98				34,564.55	87.44			
Had a child in the past two years	4,381.52	11.02				4,964.54	12.56			
Previous Parity										
0	24,540.63	61.71				18,278.81	46.24			
1	7,059.74	17.75				9,668.94	24.46			
2	8,165.54	20.53				11,581.35	29.30			
Year										
2006	4,600.20	11.57				4,592.98	11.59			
2008	4,560.65	11.47				4,475.79	11.40			
2010	4,305.72	10.83				4,391.14	10.97			
2012	4,378.93	11.01				4,252.97	10.89			
2014	4,088.39	10.28				4,149.13	10.39			
2016	4,405.62	11.08				4,428.79	11.14			
2018	4,631.19	11.65				4,604.47	11.65			
2021	4,281.86	10.77				4,267.36	10.78			
2023	4,513.36	11.35				4,366.47	11.20			
Country group										
Continental	15,488.98	38.95				15,706.27	39.73			
Eastern European/Baltic	8,427.87	21.19				8,274.51	20.93			
Nordic European	2,091.08	5.26				2,049.66	5.19			

Table 1 (continued)

	Men					Women				
	N	Mean/%	SD	Min	Max	N	Mean/%	SD	Min	Max
Southern European	7,232.89	18.19				6,776.88	17.14			
Liberal European	6,525.08	16.41				6,721.77	17.00			

possible measurement error is not equally distributed in our sample but depends on age, gender, and marital status. With increasing parental age increases also the children's age and hence the probability that they have transitioned out of the family of origin. Men are disproportionately more likely than women to not co-reside with their children, and this is especially so in the case of separation or divorce. While less problematic for our dependent variable (rarely, children below the age of two do not live in the parents' households), the measurement error may be substantial for the evaluation of previous parity, as older children are more likely to have left the household, as mentioned. In order to make sure that our findings are not invalidated as a results of such measurement error, we exploit the presence of specific rotating modules with questions about the total number of children ever had in two waves (rounds 3 and 9) to conduct a number of checks on the distribution of our dependent variable based on the household roster and on the total number of children reported by respondents. Overall, we estimated that around 7.9% of those who are identified as childless from the roster are instead parents from questionnaires, while 2.2% of those identified as parents from the roster are instead childless. We further checked the distribution by gender, and excluding older and separated or divorced respondents. Among men, 11.1% of those who are identified as childless from the roster are instead parents from questionnaires, while 2.6% of those identified as parents from the roster are instead childless. These figures for women are much lower, respectively at 5.3% and 1.6%. Among respondents below age 35, these proportions are 6.7% and 1.8% among men and 2.9% and 1.3% among women. Finally, excluding separated or divorced respondents (estimates from round 9), these proportions are respectively 4.6% and 1.8% among men and 2.4% and 1.4% among women. These proportions should not invalidate our analyses, yet two observations are in order. First, results for men should be interpreted cautiously, given the higher chances of measurement error on their parity progression compared to women. Second, we refrained from conducting our main analyses as parity-specific due to such possible measurement error, but ran sensitivity checks distinguishing first and second births (see Sect. 4.1.1 on Robustness and sensitivity checks).

Independent variables

Our main independent variables refer to labor market uncertainty as experienced by respondents at the macro-, meso-, and micro-level. It is worth noting that we consider variations in uncertainty not only across different levels and different individuals, groups, and countries but also over historical time. In other words, levels of macro-, meso-, and micro-uncertainty are time-varying. Moreover, to ensure as much as possible that the direction of the relationship goes from employment uncertainty to childbirth and not the other way around (and avoid reverse causality bias), we lagged the dependent variable, childbirth, by one round. The levels of uncertainty that are assumed

to affect childbearing are hence those present before childbirth (in most cases, around one year before[8]).

To measure macro labor market uncertainty, we match the ESS rounds with the country-year unemployment rate (%) retrieved from Eurostat and World Bank/ILO data for the missing countries and more recent years.

To measure meso labor market uncertainty, we refer to the concept of location (*lagerung*): within the limitations connected with data availability, we identified what we think are some of the most salient reference groups from the perspective of the individual's experience and perception of employment uncertainty. Relevant individual's locations are considered those individuals being of the same gender, belonging to the same birth cohort, residing in the same country, having the same social origin (migration background), and having obtained the same level of education.[9] We argue that meso-level effects result from the cumulative and multidimensional experience of individuals from these different locations; and we measure reference groups' employment uncertainty as the share, in a given country and year, of individuals in the group who are unemployed. Therefore, we calculated the share of those experiencing unemployment in each group (gender, birth cohort, country, social origin, and education) by ESS round, then averaged it for each individual. We think this assumption is more realistic than assuming everyone evaluates their position based on a single reference group resulting from the intersection of all their characteristics.[10]

Micro-level employment uncertainty is proxied by information about the respondent having previously spent a certain amount of time in unemployment. More specifically, ESS data allow us to distinguish between those who have experienced none, short (3 months or more), or long (12 months or more) unemployment spells, and also distinguish between those who have had such experience far in the past or more recently–i.e. in the 5 years previous to the interview. Based on that, our micro-level employment uncertainty variable includes 5 categories: None, Some in the past, Some recent, High in the past, and High recent labor market uncertainty. Notably, micro-level uncertainty cannot be lagged to the previous round, since we do not have longitudinal observations of the same respondents. However, we purposely chose this variable to measure individual-level uncertainty because it refers to past experiences of unemployment spells; therefore, as much as possible, pre-dating our childbirth variable.[11] To further exclude the possibility of reverse causality, we dropped (together with the missing values due to 'Don't Know', 'Refusal', and 'NA' answers) individuals who never had a paid job and who were unemployed at the interview. The latter group, in particular, may report recent labor market uncertainty, having experienced it after having had a child. In our sample, respondents who never had a paid job or were unemployed at the interview are substantially more likely to be lower-educated young women, and they are less likely to be part-

[8] Depending on when the interview took place (see footnote 4), uncertainty could be measured between a little bit less than 3 years and a bit less than 1 year before childbirth. We do not know the month of the interview nor the month of childbirth, therefore, we cannot be more precise.

[9] Gender is Male, Female; Birth cohort is 1959–69, 1970–79, 1980–89, 1990–99; Social origin is Native (born in the country), Migrant (born outside the country); Education is Lower Secondary or Less—ISCED 0–2, Upper Secondary—ISCED 3, Post-Secondary or Tertiary—ISCED 4–6.

[10] It is worth noting, on the other hand, that this assumption and operationalization come at the cost of substantially reducing the variability of our reference-group level uncertainty.

[11] Differently, we cannot use the information about current employment conditions, such as perceived job insecurity, nor we control for current partnership status, because those variables do not pre-date childbirth.

nered and to have recently had a child.[12] The cautionary exclusion of such groups from our sample selection may result in the omission of a non-negligible share of individuals for whom employment uncertainty is especially salient, suggesting that our estimates should be regarded as conservative.

Certain individuals are both more (or less) likely to experience individual, group, and country-level uncertainty, and they are also less (or more) likely to experience childbearing. For instance, young female respondents, or individuals with a migrant background, or low education. In our analyses, we take this into consideration, first, by running separate analyses by gender and, second, controlling for several respondents' characteristics: men's and women's age and age squared, level of education (Lower secondary or less, Upper secondary, Post-secondary non tertiary, Tertiary), social origin (native, migrant) and previous parity (0, 1, 2 + children). We additionally control for time-invariant contextual factors with a categorical variable for country groups (Continental, Nordic, Eastern, Southern, Liberal) and for group-specific time trends with interaction country group-ESS rounds dummies. Table 1 presents the weighted summary statistics for all variables included in the analyses.

Method

We investigate the relationship between micro-, meso-, and macro-level employment uncertainty and the probability of having had a childbirth using (weighted) linear probability models, separately for men and women. We first analyze the link between each level of experience of employment uncertainty and childbirth. We test the independent association of the three, and the presence of a direct influence of meso- and macro-levels net of the micro-level experience of employment uncertainty. Due to strong multicollinearity issues (VIF greater than 10), we cannot insert all three levels in the same model and test the simultaneous influence of micro-, meso-, and macro-level labor market uncertainty on childbearing behavior. Second, we investigate the cross-level interaction between micro- and meso-level labor market uncertainty and between micro- and macro-level labor market uncertainty.[13] Finally, we analyze the variation of the associations above by socioeconomic status, stratifying models by men's and women's educational level (Less than Tertiary *versus* Tertiary).

We cluster errors at the country level, acknowledging that individuals are nested in countries. To make the interpretation of interaction effects easier, we present results on the interplay between levels of labor market uncertainty graphically through average marginal effects (AME). We plot the AME of having experienced 'Labor market uncertainty: None' relative to the other categories (Some in the past, Some recent, High in the past, High recent) by levels of meso- and macro-levels of labor market uncertainty. In this way, we illustrate the 'advantage' in terms of childbearing probability of men and women who never experienced any labor market uncertainty compared to those who had (in varying degrees), and whether and how that 'advantage' varies by levels of social

[12] Lower Secondary or Less educated women comprise 26% of all respondents who never had a paid job or were unemployed at the interview while being only 8% of the respondents included in the analytic sample; 43% of respondents who never had a paid job or were unemployed at the interview are below age 30 while being 27% in the analytic sample; 54% of respondents who never had a paid job or were unemployed at the interview are unpartnered versus 35% in the analytic sample; 10% of respondents who never had a paid job or were unemployed at the interview did not have a child in the past two years versus 11% in the analytic sample.

[13] Given the presence of multicollinearity, we cannot test the triple interaction between the three levels.

or national uncertainty. Tables with full models are reported in Appendix A. Using cross-sectional data, we cannot apply longitudinal models (e.g. fixed effects) that control for individuals' unobserved characteristics that may affect both their likelihood of experiencing labor market uncertainty and their probability of having a child (e.g. personality or genetic traits). We acknowledge this limitation of our study and discuss the implications in the conclusions of the paper.

Results

Descriptive trends in childbearing and micro, meso, and macro labor market uncertainty

In the last two decades, Europe has been characterized by a widespread decrease in fertility rates and various peaks of labor market uncertainty connected to economic and financial crises (e.g. the Great Recession and the public debt crisis), political events (e.g. the Brexit referendum) or global health crisis (the COVID-19 pandemic). Figure 1 shows that our data reflect quite well the general negative trend of period fertility measures, albeit with quite strong heterogeneity across country groups. As expected, throughout the observed period, childbirth probabilities are higher in levels in the Nordic countries' group and the lowest in the Southern European countries' group. During the observed period, the most consistent decline in the probability of childbirth is observed in Nordic, Liberal, and Southern European countries. Childbearing probabilities remained quite stable in Continental and Eastern European countries, although with some fluctuations mostly around the financial crisis and the COVID-19 pandemic crisis.

The trends in labor market uncertainty at the macro- and meso-levels are reported in Fig. 2. While disproportionately affecting Southern European countries, unemployment rates (Fig. 2, left panel) increased in all countries in the aftermath of the Great Recession, and slightly more moderately during the COVID-19 pandemic.[14]

The right panel of Fig. 2 presents the trends in group-level uncertainty in six selected social locations, which offer an informative yet synthetic combination of country,

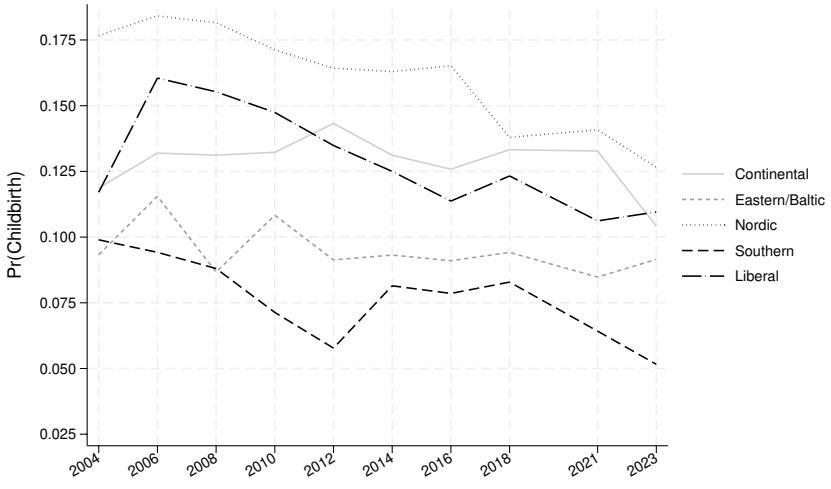

Fig. 1 Probability of childbirth between 2004 and 2023 by country group

[14] The peak in uncertainty due to the COVID-19 pandemic is diluted because we averaged the unemployment rate for the years of data collection for the ESS round 2021 (2020–2022) due to the very few interviews (and in selected countries) that were conducted in 2020.

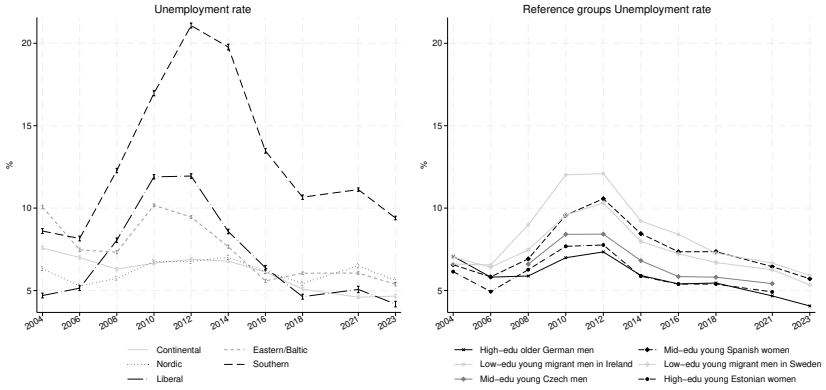

Fig. 2 Macro-level labor market uncertainty by country group and meso-level labor market uncertainty by reference group profile (2004–2023)

gender, birth cohorts, social origin, and education. German men born in 1959–69 with tertiary education, native Spanish women born in 1980–89 with upper secondary education, lower secondary (or less) educated migrant men in Ireland born in 1980–89, lower secondary (or less) educated migrant men in Sweden born in 1980–89, native Czech men born in 1980–89 with upper secondary education, and tertiary educated Estonian women born in 1980–89. Unsurprisingly, given the construction of the variable based on the (average) share of unemployed in each group, the time trend reflects the one presented in the macro unemployment rates, rising in all groups in the years 2010–2012. However, we also observe notable group-specific variations over time. In the examples presented, the gap in the level of employment uncertainty across groups widens starting from 2008 with a gradient that sees the most secure social location that of highly educated, relatively older, German men, or women in Estonia, to the least secure of low-educated, relatively younger, migrant men in Sweden or Ireland, but also young, mid-educated native women in Spain. While the former groups remain the least uncertain over most of the observed period, the relative position in the more uncertain groups changes. Until 2010, women in different contexts and with different levels of education displayed a similar labor market uncertainty profile, while from 2012, the level of employment uncertainty increased disproportionately among women with relatively lower education in Southern European countries. After 2018, their employment uncertainty increased even more and remained higher than among the least educated migrant men in other European countries.

Figure 3 shows the distribution of childbirths by persistence and recentness of micro-level labor market uncertainty experienced by the respondents in our sample, separately by gender. Childbirths are more frequent among individuals who either never experienced employment uncertainty or experienced very little in the past. In terms of gender differences, we can see that in contrast to women, among men, even more than the intensity, it is the recentness of the experience of employment uncertainty that seems linked to fewer childbirths. We do not observe, in fact, a difference in the share of respondents who had a child or not among men who experienced employment uncertainty in the past (neither some nor high), while fewer women who experienced high labor market uncertainty in the past had a child during the observed period.

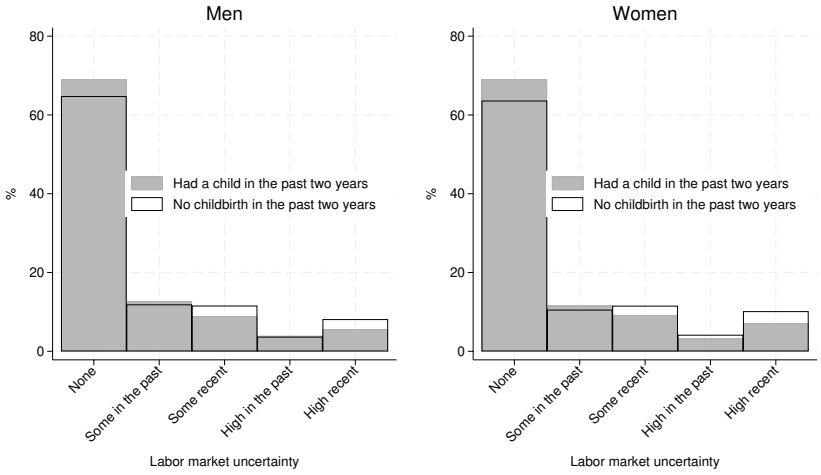

Fig. 3 Distribution of childbirths by micro-level labor market uncertainty

The association between micro, meso, and macro labor market uncertainty and childbearing probability

The negative role of individual experiences of labor market uncertainty on fertility is confirmed by our regression analysis, confirming our first hypothesis (H1a). Even when we control for macro- or meso-level uncertainty, as well as a set of relevant individual characteristics, recent and prolonged experiences of unemployment cast a clear shadow on the fertility behavior of European adults, both men and women (Tables 2 and 3). A significantly lower probability of having had a child emerges when labor market uncertainty has been experienced compared to having experienced very little in the past (or none, not shown). Recent (within the past 5 years) and prolonged unemployment spells (i.e. longer than 3 months) reduce the probability of having had a child among men. Among women, those who have also experienced some recent labor market uncertainty, or have had prolonged periods of uncertainty in the past, display a lower likelihood of having a child compared to women who experienced some labor market uncertainty in the past (or none, not shown). Our first hypothesis on gender differences (H1b) is thus not confirmed: individually experienced labor market uncertainty is more often negatively related to childbearing among women than men.

Finally, the meso- and macro-level labor market uncertainty indicators are neither statistically nor substantially significantly associated with respondents' reported fertility behavior, neither directly nor indirectly via individual-level labor market uncertainty, and for neither men nor women, thus contradicting our second hypothesis (H2a-b).

Micro-, meso-, and macro-level labor market uncertainty interactions and childbearing probability

The next step of our analysis examines the potential mutual interactive effects of different uncertainty levels. Meso- and macro-level labor market uncertainty may reinforce the documented negative relationship between individual experiences of employment uncertainty, or, on the contrary, they may attenuate the association. On the one hand, individuals who have never experienced unemployment may feel more at risk of job loss in the future if they are exposed to rising labor market uncertainty in their country

Table 2 Childbirth probability by labor market uncertainty. Linear probability model. Men. Source: Authors' elaboration based on ESS (2004–2023) data. Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)
[Micro] Labor market uncertainty (Ref: Some in the past)					
None	−0.003			−0.003	−0.002
	(−0.031–0.025)			(−0.031–0.025)	(−0.030–0.026)
Some recent	−0.011			−0.011	−0.011
	(−0.048–0.026)			(−0.048–0.026)	(−0.048–0.026)
High in the past	−0.014			−0.014	−0.014
	(−0.047–0.020)			(−0.047–0.020)	(−0.047–0.019)
High recent	−0.024*			−0.024**	−0.024**
	(−0.048–0.000)			(−0.048–−0.000)	(−0.049–−0.000)
[Meso] Ref. Group % Unemployed (lagged, mean-cent)		−0.002		−0.001	
		(−0.010–0.006)		(−0.009–0.007)	
[Macro] Unemployment rate (lagged, mean-cent)			0.002		0.002*
			(−0.000–0.003)		(−0.000–0.004)
Education (Ref: Upper Secondary–ISCED 3)					
Lower Secondary or Less–ISCED 0–2	0.009	0.007	0.007	0.010	0.010
	(−0.015–0.034)	(−0.017–0.032)	(−0.019–0.033)	(−0.014–0.033)	(−0.015–0.035)
Post-Secondary non tertiary–ISCED 4	0.003	0.002	0.002	0.003	0.003
	(−0.019–0.025)	(−0.021–0.024)	(−0.020–0.025)	(−0.019–0.025)	(−0.019–0.025)
Tertiary–ISCED 5–6	0.017**	0.017*	0.018**	0.017*	0.017**
	(0.000–0.034)	(−0.003–0.036)	(0.000–0.036)	(−0.002–0.036)	(0.000–0.035)
Social origin (Ref: Native)					
Migrant	0.018**	0.019**	0.017**	0.019**	0.018**
	(0.002–0.033)	(0.002–0.036)	(0.001–0.034)	(0.002–0.035)	(0.002–0.034)
Previous parity (Ref: Childless)					
Previous parity 1	0.149***	0.150***	0.150***	0.149***	0.149***
	(0.105–0.194)	(0.106–0.195)	(0.106–0.195)	(0.105–0.194)	(0.105–0.194)
Previous parity 2	−0.003	−0.002	−0.002	−0.003	−0.004
	(−0.024–0.018)	(−0.023–0.020)	(−0.024–0.019)	(−0.024–0.018)	(−0.025–0.018)
Age of respondent	−0.001	−0.001	−0.001	−0.001	−0.001
	(−0.003–0.001)	(−0.003–0.001)	(−0.003–0.001)	(−0.003–0.001)	(−0.003–0.001)
Age of respondent squared	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)
Country group (Ref: Continental)					
Eastern/Baltic	−0.015	−0.017	−0.020	−0.015	−0.019
	(−0.068–0.038)	(−0.070–0.036)	(−0.070–0.029)	(−0.068–0.038)	(−0.068–0.030)
Nordic	0.065***	0.066***	0.071***	0.065***	0.070***
	(0.025–0.105)	(0.027–0.104)	(0.027–0.114)	(0.026–0.103)	(0.027–0.113)
Southern	−0.048**	−0.048**	−0.047**	−0.049**	−0.049**

Table 2 (continued)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
	(−0.092–−0.005)	(−0.089–−0.007)	(−0.093–−0.001)	(−0.090–−0.007)	(−0.095–−0.003)
Liberal	0.051**	0.052**	0.060**	0.051**	0.059**
	(0.010–0.093)	(0.012–0.092)	(0.014–0.105)	(0.011–0.091)	(0.014–0.105)
Year (Ref: 2006)					
2008	0.006*	0.005	0.008*	0.005	0.008*
	(−0.001–0.013)	(−0.003–0.013)	(−0.001–0.017)	(−0.002–0.013)	(−0.001–0.017)
2010	0.011	0.010	0.014*	0.011	0.015*
	(−0.004–0.026)	(−0.007–0.028)	(−0.001–0.029)	(−0.007–0.028)	(−0.000–0.029)
2012	−0.017	−0.015	−0.015	−0.016	−0.014
	(−0.121–0.087)	(−0.124–0.094)	(−0.123–0.094)	(−0.125–0.092)	(−0.122–0.094)
2014	0.024	0.028	0.028	0.026	0.028
	(−0.027–0.076)	(−0.017–0.073)	(−0.020–0.075)	(−0.020–0.072)	(−0.019–0.075)
2016	−0.015	−0.014	−0.011	−0.015	−0.011
	(−0.067–0.038)	(−0.066–0.037)	(−0.070–0.049)	(−0.066–0.037)	(−0.070–0.049)
2018	−0.004	−0.005	0.001	−0.004	0.001
	(−0.040–0.033)	(−0.039–0.028)	(−0.042–0.043)	(−0.038–0.029)	(−0.041–0.044)
2021	−0.000	−0.001	0.006	−0.001	0.007
	(−0.020–0.020)	(−0.023–0.021)	(−0.020–0.032)	(−0.023–0.021)	(−0.019–0.033)
2023	−0.028**	−0.030***	−0.021	−0.030***	−0.021
	(−0.052–−0.005)	(−0.051–−0.010)	(−0.052–0.009)	(−0.050–−0.009)	(−0.051–0.009)
Country group x Year interaction	YES	YES	YES	YES	YES
Constant	0.124***	0.119***	0.116***	0.125***	0.121***
	(0.079–0.169)	(0.087–0.151)	(0.079–0.152)	(0.081–0.168)	(0.075–0.167)
Observations	37,967	37,967	37,967	37,967	37,967
R-squared	0.051	0.050	0.051	0.051	0.051

of residence or in their reference group. Similarly, having experienced a job loss when unemployment is high in your peers' group or at the national level may produce gloomier expectations about the future, thus furthering the negative effect of one's job loss on fertility. On the other hand, social or contextual uncertainty may project a less negative feeling due to this condition being similar to many in the individual's reference groups or geographical context.

Figure 4 reports the average marginal effects of micro-level labor market uncertainty on childbirth probability by the degree of employment uncertainty in the individual's social location by gender (Full models reported in Table 4 in Appendix A). From the top to the bottom panels in Fig. 4, we compare having never experienced individual-level labor market uncertainty (None) with all other degrees of experience of labor market uncertainty (Some in the past, Some recent, High in the past, and High recent).

Among men, we do not witness any substantive or statistically significant interaction between micro- and meso-level labor market uncertainty. In other words, the association between having individually experienced labor market uncertainty and childbearing probability does not vary depending on the labor market uncertainty experienced in one's social location. Compared to men who experienced high recent employment uncertainty, those who have never faced labor market uncertainty are always more likely to have a child (bottom-left panel, Fig. 4). The difference is statistically significant at 95% confidence level only at average levels of social location labor market uncertainty, but

Table 3 Childbirth probability by labor market uncertainty. Linear probability model. Women. Source: Authors' elaboration based on ESS (2004–2023) data. Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)
[Micro] Labor market uncertainty (Ref: Some in the past)					
None	−0.009			−0.009	−0.008
	(−0.023–0.006)			(−0.023–0.006)	(−0.022–0.006)
Some recent	−0.044***			−0.044***	−0.044***
	(−0.064–−0.024)			(−0.064–−0.024)	(−0.064–−0.024)
High in the past	−0.023*			−0.023*	−0.024*
	(−0.049–0.002)			(−0.049–0.002)	(−0.050–0.002)
High recent	−0.034***			−0.034***	−0.035***
	(−0.048–−0.021)			(−0.048–−0.021)	(−0.049–−0.022)
[Meso] Ref. Group % Unemployed (lagged, mean-cent)		0.000		0.003	
		(−0.008–0.008)		(−0.006–0.011)	
[Macro] Unemployment rate (lagged, mean-cent)			0.002*		0.003**
			(−0.000–0.004)		(0.000–0.005)
Education (Ref: Upper Secondary–ISCED 3)					
Lower Secondary or Less–ISCED 0–2	−0.003	−0.008	−0.007	−0.004	−0.002
	(−0.013–0.006)	(−0.021–0.005)	(−0.020–0.006)	(−0.014–0.006)	(−0.011–0.007)
Post-Secondary non tertiary–ISCED 4	0.001	−0.000	0.000	0.001	0.002
	(−0.015–0.017)	(−0.017–0.016)	(−0.016–0.017)	(−0.015–0.017)	(−0.014–0.018)
Tertiary–ISCED 5–6	0.014**	0.015**	0.015**	0.016**	0.015**
	(0.001–0.028)	(0.002–0.028)	(0.001–0.030)	(0.003–0.029)	(0.001–0.029)
Social origin (Ref: Native)					
Migrant	0.006	0.003	0.003	0.003	0.006
	(−0.012–0.023)	(−0.012–0.018)	(−0.014–0.020)	(−0.012–0.019)	(−0.012–0.024)
Previous parity (Ref: Childless)					
Previous parity 1	0.093***	0.093***	0.093***	0.093***	0.093***
	(0.058–0.128)	(0.058–0.128)	(0.058–0.128)	(0.058–0.128)	(0.058–0.128)
Previous parity 2	−0.033***	−0.033***	−0.034***	−0.033***	−0.034***
	(−0.046–−0.019)	(−0.046–−0.020)	(−0.047–−0.021)	(−0.046–−0.020)	(−0.047–−0.020)
Age of respondent	−0.006***	−0.005***	−0.005***	−0.006***	−0.006***
	(−0.009–−0.003)	(−0.008–−0.003)	(−0.008–−0.003)	(−0.008–−0.003)	(−0.008–−0.003)
Age of respondent squared	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)
Country group (Ref: Continental)					
Eastern/Baltic	−0.053**	−0.056***	−0.061***	−0.053**	−0.059***

Table 3 (continued)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
	(−0.096–−0.010)	(−0.097–−0.015)	(−0.098–−0.024)	(−0.097–−0.009)	(−0.099–−0.019)
Nordic	0.018	0.019	0.025	0.019	0.026
	(−0.018–0.055)	(−0.018–0.056)	(−0.015–0.065)	(−0.019–0.057)	(−0.015–0.067)
Southern	−0.031	−0.032	−0.033	−0.029	−0.032
	(−0.082–0.020)	(−0.082–0.017)	(−0.082–0.015)	(−0.082–0.023)	(−0.083–0.019)
Liberal	0.032**	0.035**	0.045**	0.033**	0.043**
	(0.002–0.062)	(0.006–0.065)	(0.011–0.078)	(0.002–0.064)	(0.009–0.078)
Year (Ref: 2006)					
2008	−0.005	−0.005	−0.003	−0.003	−0.002
	(−0.042–0.032)	(−0.042–0.032)	(−0.039–0.032)	(−0.039–0.033)	(−0.037–0.033)
2010	−0.031**	−0.029**	−0.025*	−0.030**	−0.026*
	(−0.057–−0.004)	(−0.056–−0.003)	(−0.053–0.003)	(−0.057–−0.002)	(−0.054–0.003)
2012	−0.007	−0.007	−0.002	−0.009	−0.002
	(−0.067–0.052)	(−0.068–0.054)	(−0.066–0.061)	(−0.071–0.053)	(−0.066–0.062)
2014	0.019	0.018	0.022	0.015	0.024
	(−0.022–0.059)	(−0.023–0.059)	(−0.011–0.055)	(−0.025–0.054)	(−0.009–0.056)
2016	−0.028***	−0.029***	−0.025***	−0.027***	−0.022***
	(−0.047–−0.009)	(−0.046–−0.011)	(−0.037–−0.013)	(−0.045–−0.010)	(−0.035–−0.010)
2018	−0.028**	−0.028**	−0.023	−0.026**	−0.021
	(−0.053–−0.003)	(−0.054–−0.003)	(−0.052–0.007)	(−0.051–−0.001)	(−0.050–0.009)
2021	−0.012	−0.011	−0.003	−0.010	−0.002
	(−0.027–0.004)	(−0.029–0.007)	(−0.030–0.023)	(−0.028–0.008)	(−0.029–0.026)
2023	−0.047***	−0.046***	−0.038**	−0.044**	−0.037*
	(−0.079–−0.015)	(−0.078–−0.014)	(−0.075–−0.001)	(−0.079–−0.009)	(−0.076–0.003)
Country group x Year interaction	YES	YES	YES	YES	YES
Constant	0.180***	0.166***	0.163***	0.179***	0.175***
	(0.144–0.216)	(0.138–0.194)	(0.133–0.193)	(0.142–0.216)	(0.137–0.214)
Observations	41,328	41,328	41,328	41,328	41,328
R-squared	0.045	0.043	0.044	0.045	0.045

this is more likely to be due to the low number of observations at the two extremes than to non-linear interaction effects.

Also, among women, those who recently experienced prolonged employment uncertainty are not affected by the level of uncertainty in their social location, being always less likely to have had a child compared to women who never experienced unemployment, irrespective of the levels of meso-labor market uncertainty (bottom-right panel, Fig. 4). Also not affected by their social location are women who experienced very short spells of unemployment in the past: their probability of having a child does not differ from those who never experienced any labor market uncertainty in their working career (top-right panel, Fig. 4). An indication of the existence of a possible interaction between the micro- and meso-levels appears instead among women with intermediate profiles, namely, women with some recent or past prolonged unemployment (second- and third-right panels, Fig. 4). Although differences within cases over reference groups' labor market uncertainty are not statistically significant, greater employment uncertainty in the reference group tends to be associated with smaller differences between women who

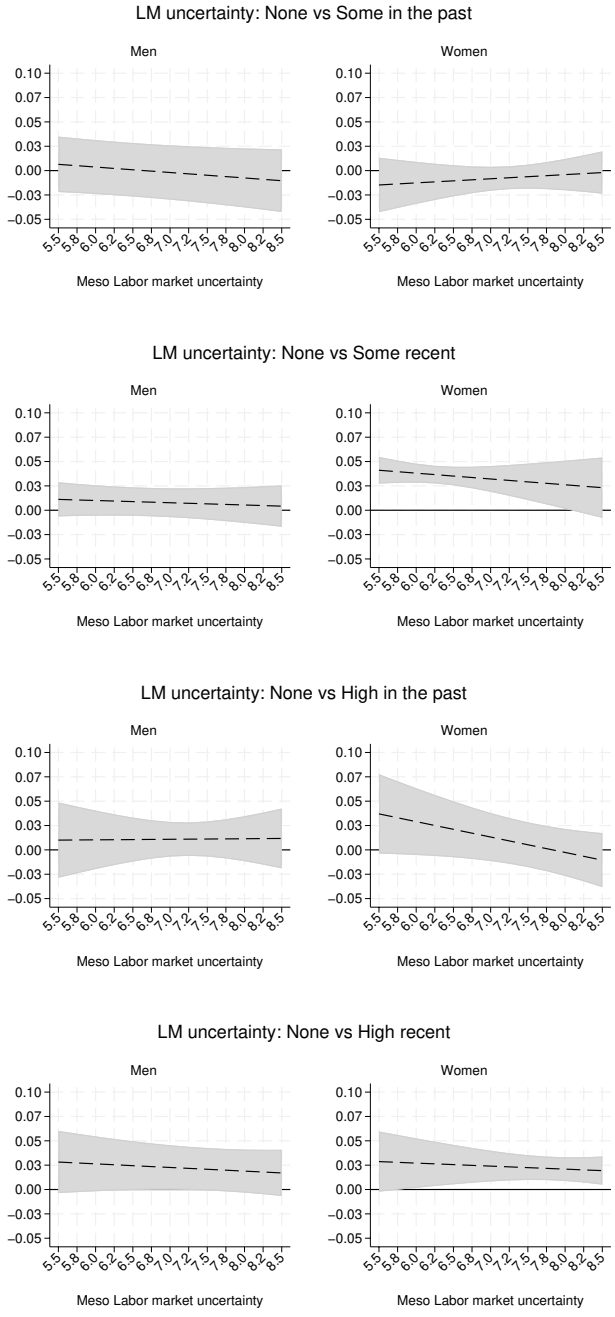

Fig. 4 Average Marginal Effects of micro- by meso-level labor market uncertainty by gender

report having never experienced labor market uncertainty and those who reported some recent or high labor market uncertainty in the past.

It can be argued, therefore, that an individual's experience takes precedence over evidence from the reference groups; however, the positive association between being spared the individual experience of unemployment and childbearing may be attenuated if women (but not men) are exposed to high employment uncertainty in their social locations.

Figure 5 reports the average marginal effects of micro-level labor market uncertainty on childbirth probability by the level of macro-level labor market uncertainty, namely country-level unemployment rate. As in Fig. 4, from the top to the bottom panels in Fig. 5, we compare having never experienced individual-level employment uncertainty (None) with all other degrees of experience of employment uncertainty (Some in the past, Some recent, High in the past, and High recent). Among men who experienced short spells of unemployment in the past, we witness a statistically significant attenuating

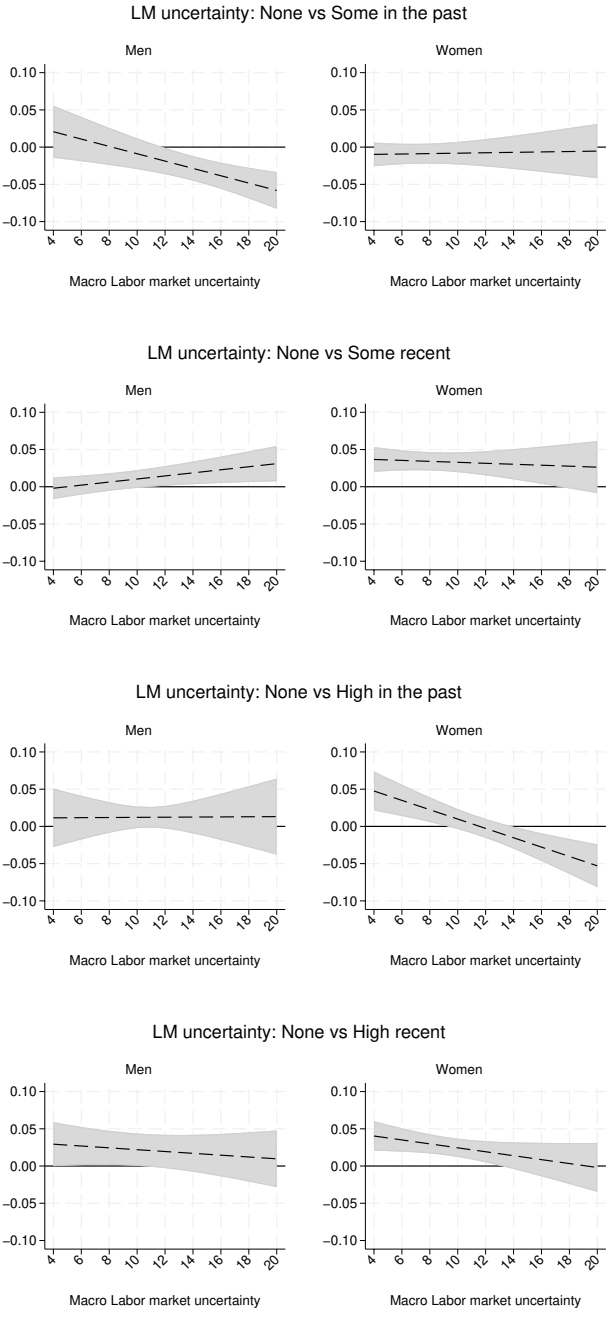

Fig. 5 Average Marginal Effects of micro- by macro-level labor market uncertainty by gender

effect of aggregate unemployment rates on the association between micro-level employment uncertainty and childbearing probability (top-left panel, Fig. 5). Although without statistically significant changes within groups, having experienced no labor market uncertainty represents, in terms of childbearing chances, an advantage with respect to having experienced long and recent spells of unemployment at low-to-average levels of aggregate unemployment (bottom-left panel, Fig. 5) while it represents an advantage with respect to having experienced only some recent labor market uncertainty at high levels of aggregate unemployment (second left panel, Fig. 5). Finally, for men who experienced long spells of unemployment in the past, we don't see any moderating impact of aggregate unemployment (third left panel, Fig. 5).

Women, in contrast, display a more consistent attenuating effect across groups. The greater probability of childbirth among women who never experienced labor market uncertainty compared to the experience of high (past and recent) uncertainty decreases considerably in macro-level contexts characterized by high labor market uncertainty. With rising country-level unemployment rates, the difference between the two groups, which is significant at a low level of macro uncertainty, disappears and turns negative in the case of past prolonged experiences of own unemployment.

These findings only partially support our third hypothesis in its general formulation (H3a), and do not confirm the gender specific argument of our hypothesis (H3b). In fact, we find no evidence of a multiplicative negative effect, but a more consistent attenuation effect (especially of macro-level conditions) among women than among men. The analyses show that the individual experience of employment uncertainty negatively affects individual reproductive decisions and that such personal experience supersedes the information derived from local or group experiences. Moreover, for many men and women, the relationship is not moderated by social or local labor market conditions. Yet, results also indicate that, for some groups, especially among women, the advantage of never having experienced unemployment individually declines with growing labor market uncertainty within an individual's social location and especially in the national context. Hence, we find evidence of a negative effect of indirect exposure to unemployment. In the final step of our analyses, we explore the extent to which these average associations mask, or do not, heterogeneous associations along the social stratification gradient (Less than Tertiary *versus* Tertiary).

Heterogeneity by education

Figure 6 shows that it is less than tertiary educated men who postpone childbearing in response to high and recent employment uncertainty, relative to less than tertiary educated men with none or very little past experience of employment uncertainty. Among tertiary educated men and women, the difference is not statistically significant (with negative point estimates). The reason for not finding a statistically significant coefficient may be the low number of tertiary educated individuals who experience high and recent employment uncertainty. In the group of the less than tertiary educated women, where high and recent employment uncertainty is more common, we do find a negative association with childbirth probability. We find a similarly negative marginal effect for less than tertiary educated women who experienced some recent or past prolonged labor market uncertainty, compared to none or some in the past.

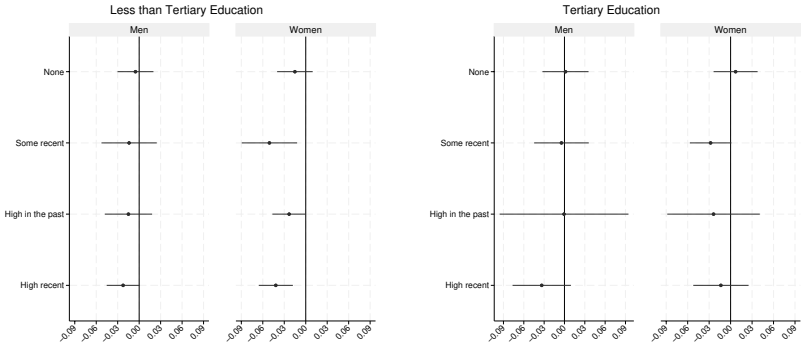

Fig. 6 Average marginal effects of micro-level labor market uncertainty and educational level (Less than Tertiary vs. Tertiary education) by gender

Figure 7 reports the findings from the interaction between individual and social location uncertainty, stratifying models by educational level. Among men, we confirm the insignificant interaction between the micro- and meso-levels of employment uncertainty across educational levels. We also observe for both educational levels a higher probability of childbirth among men with no labor market uncertainty experience, relative to men with high recent uncertainty experience, only in social locations with low labor market uncertainty. Among women, we also observe no significant interactions between the micro- and meso-levels within groups. The previously observed weakening of the negative association between micro-level labor market uncertainty and childbirths as labor market uncertainty increases in women's social location is observed only in the groups of less than tertiary educated women who experienced short but recent unemployment spells, and tertiary educated women who experienced long spells of unemployment in the past.

Figure 8 reports findings from the interaction between micro- and macro-level labor market uncertainty, by educational level. With few exceptions, we observe once more that having experienced no labor market uncertainty is more positively associated with childbirth probability in national contexts characterized by relatively low employment uncertainty. This is generally true for both men and women, and for the tertiary and non-tertiary educated. An attenuation effect of local labor market conditions on the nexus between personal experience of unemployment and childbearing probability is evident for men–especially, but not only, if tertiary educated–when comparing the experience of some labor market uncertainty in the past to none; among less than tertiary educated women who experience prolonged unemployment (recent or in the past); and finally among tertiary educated women when comparing childbearing probability for those who never experienced labor market uncertainty relative to having experienced it for a prolonged period in the past. The only exception is the group of tertiary-educated men with some recent experience of unemployment who display evidence of a significant multiplicative negative effect of macro-level unemployment on childbearing probability.

All in all, our results do not seem to support our fourth hypothesis in its general (H4a) and gender specific (H4b) formulation. Instead, findings suggest that the individual experience of labor market uncertainty is more often detrimental for childbearing chances among non-tertiary educated respondents, especially women. The role of social

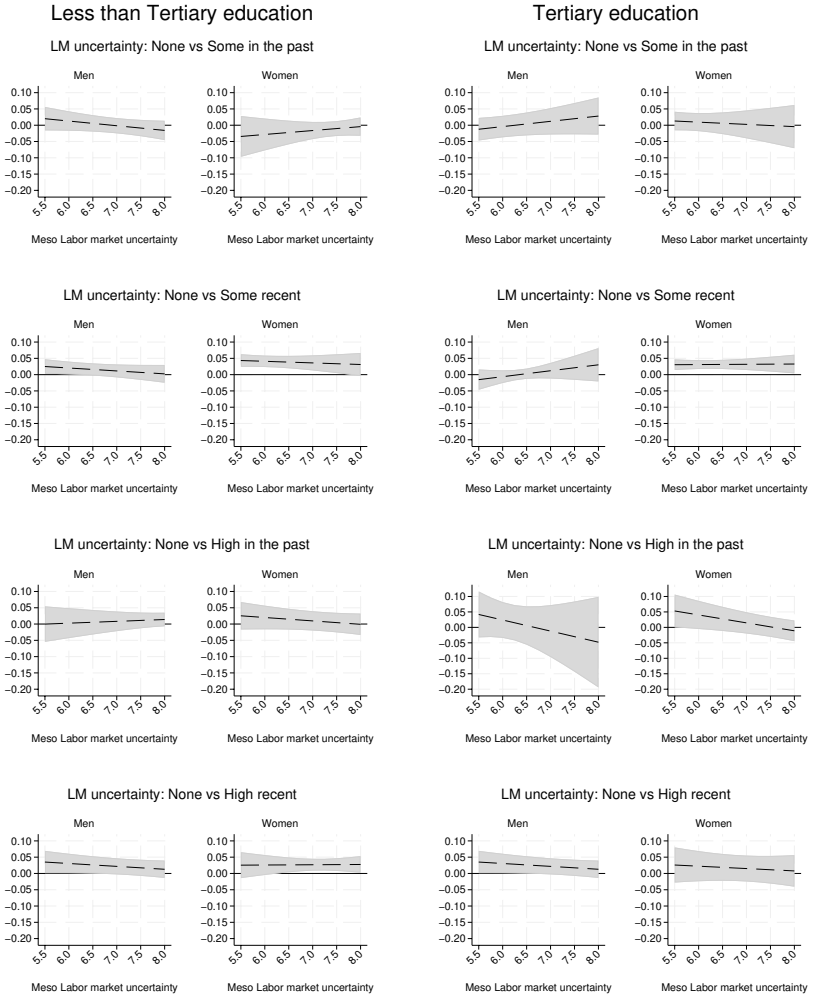

Fig. 7 Average Marginal Effects of micro- by meso-level labor market uncertainty and educational level (Less than Tertiary vs. Tertiary education) by gender

and contextual labor market conditions is generally similar across educational levels. We find some support for an attenuation effect of macro-level employment uncertainty for both tertiary and non-tertiary educated women. Results for men are more contradictory. While we find evidence of some attenuation for (tertiary and non-tertiary educated) men who experienced little individual uncertainty in the past, tertiary-educated men tend to display a behavior consistent with a multiplicative negative effect of macro-level employment uncertainty on childbearing probability when experiencing little but recent unemployment.

Robustness and sensitivity checks

We ran several robustness checks to ensure the soundness of our findings (results available upon request). First, using a more stringent operationalization of individual-level employment uncertainty in which we distinguish only the experience of long-term unemployment, recent and non-recent, we obtain qualitatively similar results;

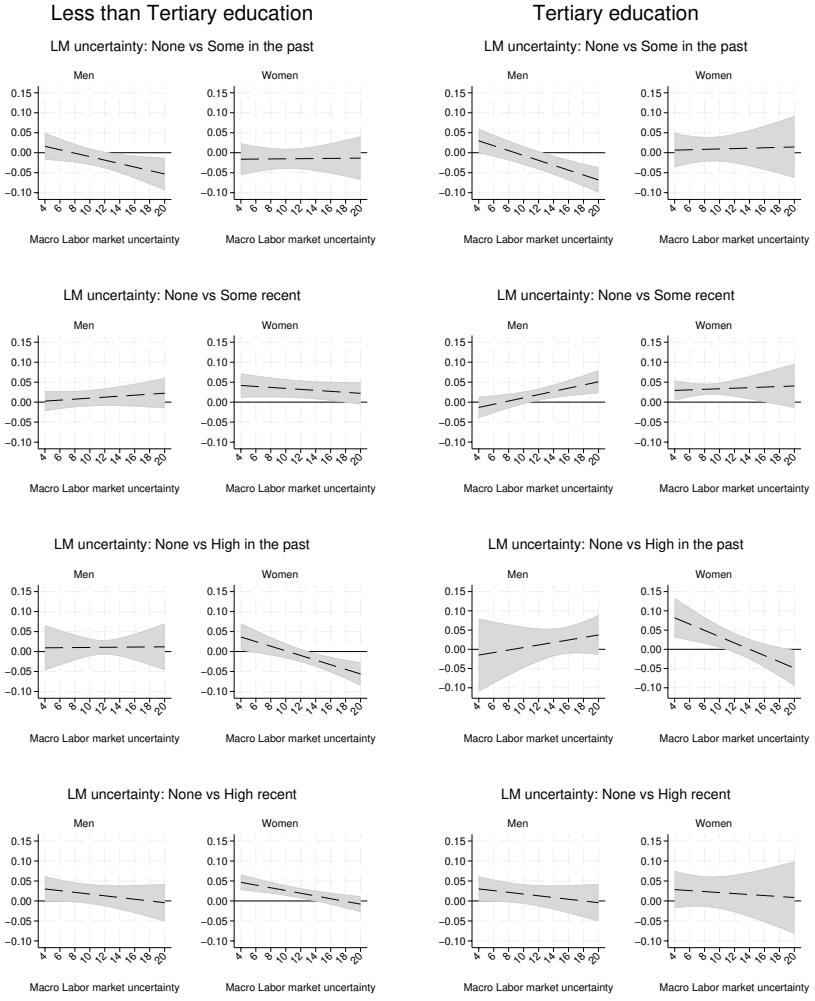

Fig. 8 Average Marginal Effects of micro- by macro-level labor market uncertainty and educational level (Less than Tertiary vs. Tertiary education) by gender

confidence intervals become smaller as the number of observations in each cell increases, yet we lose sight on the more nuanced differences between short- and long-term labor market uncertainty experiences, therefore, we decided to keep a more refined version of the variable in the analysis. Second, using a single reference group per respondent based on all characteristics does not alter our findings. Third, we obtain the same results when measuring meso-level employment uncertainty through reference groups' unemployment rate variance instead of its mean level. As it measures volatility, the variance could be considered a better indicator of uncertainty; however, we decided to keep social location mean-levels of unemployment in our main analysis to favor consistency with the measures at the other levels (i.e., macro and micro).

Finally, we did some sensitivity checks and ran our analyses by parity (first and second). As displayed in Fig. 9 in Appendix B, we see that our findings on individual-level labor market uncertainty are largely driven by childless men and women, although mothers respond more similarly to childless women compared to how fathers do with

respect to childless men. As in the pooled analysis, we do not find evidence of cross-level employment uncertainty interactions among men, neither childless nor fathers (Figs. 10-11). Instead, looking at results by parity, it becomes even clearer the attenuation effect of especially national-level conditions (but also of the social location labor market uncertainty) for women, largely driven by mothers. Further stratifying for education also confirms it is the non-tertiary educated mothers who are particularly sensitive to social and contextual conditions (not shown, results available upon request), while no major patterns emerge among men.

Discussion

The aim of this study was to go beyond the existing literature linking labor market uncertainty to fertility at the macro- and micro-level by adding the meso-level perspective. Existing studies tended (virtuously) towards the theoretical conceptualization and operationalization of employment uncertainty in terms of timing (past versus future looking measures) while, often, neglecting their spatial and, always, neglecting their group experience. We argued instead that the meso-level, or social location (*lagerung*), is relevant as an additional channel through which economic uncertainty is experienced and influences childbearing behavior, both independently and as a moderator of individual-level uncertainty.

The study used data collected from 30 countries in the 2004–2023 rounds of the European Social Survey (ESS) and linear probability models to investigate the extent to which the probability of having a child depends on the exposure to labor market uncertainty at the social location level, beyond the effects at the individual and national levels. We operationalized the social location with membership to given (ascribed) reference groups based on individuals' birth cohort, country of residence, social origin, and educational level, and their level of employment uncertainty, with group-level share of unemployed. We measured labor market uncertainty at the national level using the country's annual unemployment rate and at the individual level with the occurrence and intensity of previous experiences of unemployment. Knowing from the existing literature that the nexus of employment uncertainty-fertility differs between men and women, we stratified our analyses by gender.

As previously determined, we found that greater individual-level labor market uncertainty, especially if prolonged and recent, negatively correlates with the chance of having a child. However, in contrast to men, among women, experiencing some recent labor market uncertainty also correlates with a lower probability of having a child relative to having experienced none.

We also found that—on their own–neither the labor market uncertainty experienced in one's social location nor that experienced in the country of residence is significantly associated with the probability of having a child, neither directly nor indirectly through one's own experience of employment uncertainty. We also observe no statistically significant moderating effect of meso-level experience of employment uncertainty on the relationship between the individual experience of labor market uncertainty and childbearing. In contrast, gender differences emerged in the moderating role of macro-level uncertainty: among women, experiencing high unemployment in the country of residence attenuates the negative association between individual-level labor market uncertainty and the probability of having a child. Among men, we found evidence of

a behavior consistent with an attenuation mechanism only for those who have experienced some unemployment in the past.

Importantly, in social locations and especially in national contexts characterized by greater labor market uncertainty, the difference in the probability of childbirth by micro-level employment uncertainty diminishes, particularly among women. As labor market uncertainty increases in the reference group and country of residence, the probability of having a child declines among respondents who have never experienced unemployment spells themselves.

We also tested the heterogeneity of the effects depending on individuals' socioeconomic status, proxied by their educational level. Two results are worth highlighting in this regard. First, the attenuation mechanism of aggregate unemployment rate for women is common to both the tertiary and non-tertiary educated. Second, while the attenuation mechanism for men experiencing some uncertainty in the past is also common to all educational levels, among tertiary-educated men experiencing some recent employment uncertainty, we found evidence of a multiplicative negative effect. All in all, however, we observed greater differences in the moderating role of social and contextual uncertainty by personal experience of unemployment and gender than across educational levels.

Our study does not come without limitations. First, our analyses are based on repeated cross-sectional data, which, in the attempt to measure uncertainty before conception, limit the type of variables that we can use. The data structure also limits our sample selection, which may result in the omission of a non-negligible share of individuals for whom uncertainty at all three levels may be especially salient. In addition, due to the lack of information in our data regarding respondents' actual social locations, namely, real social network peers' labor market positions, we relied on ascribed social locations. These analytical constraints may result in an underestimation of the true effect of employment uncertainty on fertility. Second, we rely on the Own-children method (Cho et al., 1986) since we do not have information about full birth histories but only about resident children. As a result of these data limitations, selection bias on unobserved characteristics (time constant and time varying) may affect our conclusions, and we cannot identify any causal relationship between economic uncertainty and childbirth probability. In addition, results for men should be interpreted cautiously, given the greater chances of measurement error on their parity progression compared to women (descriptive evidence available upon request). Third, our analyses cover a large number of countries with heterogeneous welfare regimes, institutions, and family and cultural norms. Due to space limitations, we could not delve into country-group differences, which are, though, very likely to be present. Fourth, we limit our investigation to only one specific aspect of labor market uncertainty, while there are other dimensions of economic and labor market uncertainty that may be as relevant for childbearing, such as temporary contracts, involuntary part-time, income or wealth volatility, and housing uncertainty. A promising avenue for future research could be to conceptualize as a multilevel

experience also the nexus between these dimensions of economic uncertainty and fertility behavior. Finally, as mentioned earlier, in order to ensure the comparability of our findings with previous existing demographic studies, and again due to data limitations, we operationalized individual-level labor market uncertainty using past experiences of unemployment and not subjective perceptions of possible future job losses. Future contributions on this stream of research could leverage longitudinal data with more accurate indicators about the respondent's ability to predict future labor market outcomes.

Despite these limitations, we can say that the social location, to some extent, and more consistently, the broader country context plays a relevant role in moderating the direct and individual experience of employment uncertainty, particularly among women. When things go bad individually–that is, when employment uncertainty is persistent or recently experienced–the protective factor of a less uncertain social or contextual environment appears limited: the negative consequences for fertility behavior are felt across genders and educational levels alike. Conversely, when things go personally well–that is, when employment uncertainty has never been experienced–there is a clear advantage, reinforced by higher education, in terms of being "free to have (additional) children" (see similar findings in Albertini et al., 2024). However, this advantage, evident in normal times, is rapidly eroded when adverse conditions arise in one's social location or place of residence: even a safe, well-equipped boat may not sink, but it will still feel the storm ravaging around it.

Appendix A

Full interaction models

See Tables 4, 5, 6 and 7.

Table 4 Childbirth probability by micro-meso- and micro–macro levels' labor market uncertainty interactions. Linear probability model. Men and women. Source: Authors' elaboration based on ESS (2004–2023). Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Men	Women	Men	Women
[Micro] Labor market uncertainty (Ref: Some in the past)				
None	0.036	−0.037	0.039*	−0.010
	(−0.018–0.090)	(−0.145–0.072)	(−0.006–0.083)	(−0.032–0.012)
Some recent	0.010	−0.111**	0.048*	−0.051***
	(−0.048–0.068)	(−0.208–−0.013)	(−0.002–0.099)	(−0.085–−0.018)
High in the past	0.033	−0.157*	0.028	−0.081***
	(−0.112–0.179)	(−0.341–0.026)	(−0.035–0.091)	(−0.127–−0.036)
High recent	−0.011	−0.080**	0.005	−0.060***
	(−0.084–0.062)	(−0.155–−0.005)	(−0.038–0.048)	(−0.091–−0.029)
[Meso] Ref. Group % Unemployed (lagged, mean-cent)	0.003	−0.003		
	(−0.006–0.013)	(−0.015–0.009)		
[Macro] Unemployment rate (lagged, mean-cent)			0.006***	0.002
			(0.003–0.009)	(−0.002–0.005)
None*Ref. Group % Unemployed (lagged, mean-cent)	−0.006	0.004		
	(−0.013–0.002)	(−0.011–0.019)		
Some recent*Ref. Group % Unemployed (lagged, mean-cent)	−0.003	0.010		
	(−0.009–0.003)	(−0.003–0.023)		
High in the past *Ref. Group % Unemployed (lagged, mean-cent)	−0.007	0.019		
	(−0.030–0.016)	(−0.006–0.045)		
High recent*Ref. Group % Unemployed (lagged, mean-cent)	−0.002	0.007		
	(−0.013–0.008)	(−0.003–0.017)		
None*Unemployment rate (lagged, mean-cent)			−0.005***	0.000
			(−0.008–−0.002)	(−0.002–0.003)
Some recent *Unemployment rate (lagged, mean-cent)			−0.007***	0.001
			(−0.010–−0.004)	(−0.002–0.003)
High in the past *Unemployment rate (lagged, mean-cent)			−0.005**	0.006**
			(−0.009–−0.001)	(0.001–0.012)
High recent*Unemployment rate (lagged, mean-cent)			−0.004**	0.003*
			(−0.006–−0.001)	(−0.000–0.005)
Education (Ref: Upper Secondary–ISCED 3)				
Lower Secondary or Less–ISCED 0–2	0.010	−0.004	0.010	−0.001
	(−0.014–0.033)	(−0.015–0.006)	(−0.014–0.034)	(−0.011–0.008)
Post-Secondary non tertiary–ISCED 4	0.003	0.001	0.003	0.002
	(−0.019–0.025)	(−0.014–0.017)	(−0.019–0.025)	(−0.013–0.018)
Tertiary–ISCED 5–6	0.016*	0.016**	0.017**	0.015**
	(−0.003–0.036)	(0.002–0.029)	(0.000–0.035)	(0.001–0.029)
Social origin (Ref: Native)				

Table 4 (continued)

	Model (1)	Model (2)	Model (3)	Model (4)
	Men	**Women**	**Men**	**Women**
Migrant	0.019**	0.004	0.018**	0.006
	(0.002–0.035)	(−0.012–0.019)	(0.002–0.034)	(−0.012–0.024)
Country group (Ref: Continental)				
Eastern/Baltic	−0.015	−0.053**	−0.019	−0.061***
	(−0.068–0.038)	(−0.097–−0.010)	(−0.068–0.030)	(−0.100–−0.022)
Nordic	0.065***	0.019	0.071***	0.025
	(0.027–0.103)	(−0.019–0.057)	(0.028–0.113)	(−0.016–0.065)
Southern	−0.048**	−0.029	−0.049**	−0.032
	(−0.090–−0.007)	(−0.082–0.023)	(−0.095–−0.003)	(−0.083–0.019)
Liberal	0.051**	0.033**	0.060**	0.041**
	(0.011–0.091)	(0.002–0.063)	(0.015–0.104)	(0.008–0.075)
Previous parity (Ref: Childless)				
Previous parity 1	0.149***	0.093***	0.149***	0.093***
	(0.105–0.194)	(0.058–0.128)	(0.104–0.193)	(0.059–0.128)
Previous parity 2	−0.003	−0.033***	−0.004	−0.033***
	(−0.024–0.018)	(−0.046–−0.020)	(−0.025–0.018)	(−0.046–−0.020)
Age of respondent	−0.001	−0.006***	−0.001	−0.006***
	(−0.003–0.001)	(−0.008–−0.003)	(−0.003–0.001)	(−0.008–−0.003)
Age of respondent squared	−0.001***	−0.001***	−0.001***	−0.001***
	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)
Year (Ref: 2006)				
2008	0.005	−0.003	0.008*	−0.003
	(−0.003–0.013)	(−0.040–0.033)	(−0.001–0.016)	(−0.038–0.033)
2010	0.011	−0.030**	0.014*	−0.026*
	(−0.007–0.028)	(−0.057–−0.003)	(−0.000–0.029)	(−0.054–0.002)
2012	−0.016	−0.010	−0.014	−0.003
	(−0.125–0.092)	(−0.073–0.054)	(−0.122–0.094)	(−0.066–0.060)
2014	0.026	0.014	0.028	0.023
	(−0.019–0.071)	(−0.024–0.053)	(−0.020–0.075)	(−0.010–0.056)
2016	−0.015	−0.028***	−0.011	−0.023***
	(−0.066–0.036)	(−0.046–−0.009)	(−0.070–0.048)	(−0.035–−0.011)
2018	−0.005	−0.027**	0.002	−0.021
	(−0.038–0.029)	(−0.051–−0.002)	(−0.041–0.044)	(−0.049–0.007)
2021	−0.001	−0.010	0.007	−0.003
	(−0.023–0.021)	(−0.027–0.007)	(−0.019–0.033)	(−0.028–0.022)
2023	−0.030***	−0.045***	−0.021	−0.038**
	(−0.050–−0.010)	(−0.078–−0.012)	(−0.050–0.008)	(−0.075–−0.001)
Country group x Year interaction	YES	YES	YES	YES
Constant	0.102***	0.200***	0.070**	0.164***
	(0.041–0.162)	(0.094–0.307)	(0.016–0.125)	(0.118–0.210)
Observations	37,967	41,328	37,967	41,328
R-squared	0.051	0.045	0.052	0.046

Table 5 Childbirth probability by micro-levels labor market uncertainty by education. Linear probability model. Men and women. Source: Authors' elaboration based on ESS (2004–2023). Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Less than Tertiary education		Tertiary education	
	Men	Women	Men	Women
[Micro] Labor market uncertainty (Ref: Some in the past)				
None	−0.005	−0.015	0.002	0.007
	(−0.030–0.020)	(−0.040–0.010)	(−0.033–0.036)	(−0.024–0.038)
Some recent	−0.014	−0.051**	−0.004	−0.028*
	(−0.053–0.025)	(−0.089–−0.012)	(−0.045–0.036)	(−0.057–0.001)
High in the past	−0.015	−0.023*	−0.001	−0.024
	(−0.048–0.018)	(−0.047–0.000)	(−0.096–0.094)	(−0.088–0.041)
High recent	−0.022*	−0.042***	−0.034	−0.014
	(−0.045–0.000)	(−0.066–−0.018)	(−0.077–0.009)	(−0.052–0.025)
Social origin (Ref: Native)				
Migrant	0.020*	0.013	0.017**	−0.009
	(−0.001–0.040)	(−0.007–0.032)	(0.001–0.034)	(−0.030–0.012)
Country group (Ref: Continental)				
Eastern/Baltic	0.002	−0.049***	−0.047	−0.078*
	(−0.030–0.034)	(−0.080–−0.018)	(−0.150–0.055)	(−0.162–0.005)
Nordic	0.048**	0.002	0.098*	0.015
	(0.012–0.084)	(−0.037–0.040)	(−0.004–0.200)	(−0.049–0.080)
Southern	−0.028	−0.006	−0.089*	−0.090**
	(−0.068–0.012)	(−0.069–0.057)	(−0.180–0.003)	(−0.157–−0.023)
Liberal	0.047***	0.044***	0.043	0.001
	(0.022–0.072)	(0.024–0.064)	(−0.049–0.135)	(−0.061–0.062)
Previous parity (Ref: Childless)				
Previous parity 1	0.140***	0.075***	0.169***	0.112***
	(0.102–0.178)	(0.045–0.106)	(0.106–0.232)	(0.057–0.167)
Previous parity 2	0.009	−0.029***	−0.038**	−0.051***
	(−0.013–0.032)	(−0.040–−0.019)	(−0.067–−0.009)	(−0.081–−0.022)
Age of respondent	−0.003***	−0.009***	0.004**	−0.000
	(−0.005–−0.001)	(−0.012–−0.006)	(0.000–0.008)	(−0.004–0.004)
Age of respondent squared	−0.001***	−0.001***	−0.001***	−0.002***
	(−0.002–−0.001)	(−0.001–−0.001)	(−0.002–−0.001)	(−0.002–−0.002)
Year (Ref: 2006)				
2008	0.004	−0.002	0.020	−0.018
	(−0.009–0.017)	(−0.043–0.038)	(−0.038–0.078)	(−0.049–0.013)
2010	0.016**	−0.027***	0.001	−0.047
	(0.003–0.028)	(−0.045–−0.010)	(−0.037–0.039)	(−0.117–0.022)
2012	−0.015	−0.001	−0.025	−0.036
	(−0.115–0.085)	(−0.041–0.040)	(−0.164–0.115)	(−0.150–0.078)
2014	0.018	0.027	0.044	−0.014
	(−0.049–0.085)	(−0.020–0.075)	(−0.022–0.111)	(−0.052–0.024)
2016	−0.008	−0.014	−0.038	−0.065**
	(−0.045–0.028)	(−0.038–0.009)	(−0.156–0.081)	(−0.118–−0.011)
2018	−0.006	−0.031**	−0.007	−0.036*
	(−0.034–0.022)	(−0.054–−0.008)	(−0.097–0.084)	(−0.076–0.003)
2021	0.021	−0.001	−0.048	−0.042
	(−0.012–0.055)	(−0.021–0.019)	(−0.138–0.042)	(−0.127–0.043)
2023	−0.011	−0.020	−0.062***	−0.101***
	(−0.047–0.024)	(−0.049–0.009)	(−0.106–−0.019)	(−0.159–−0.043)

Table 5 (continued)

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Less than Tertiary education		Tertiary education	
	Men	Women	Men	Women
Country group x Year interaction	YES	YES	YES	YES
Constant	0.119***	0.170***	0.162***	0.226***
	(0.080–0.159)	(0.133–0.207)	(0.059–0.266)	(0.162–0.289)
Observations	25,142	23,672	12,825	17,656
R-squared	0.046	0.048	0.075	0.058

Table 6 Childbirth probability by micro-meso-levels and micro–macro-levels labor market uncertainty interaction by education. Linear probability model. Men. Source: Authors' elaboration based on ESS (2004–2023). Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Less than Tertiary education		Tertiary education	
[Micro] Labor market uncertainty (Ref: Some in the past)				
None	0.096	0.031	−0.099	0.054***
	(−0.026–0.218)	(−0.015–0.077)	(−0.255–0.057)	(0.016–0.093)
Some recent	0.018	0.031	0.020	0.085***
	(−0.076–0.112)	(−0.035–0.097)	(−0.087–0.127)	(0.056–0.113)
High in the past	0.127	0.020	−0.349*	0.073
	(−0.028–0.282)	(−0.050–0.089)	(−0.721–0.023)	(−0.084–0.230)
High recent	0.003	−0.010	0.035	0.041*
	(−0.137–0.144)	(−0.065–0.045)	(−0.165–0.234)	(−0.003–0.085)
[Meso] Ref. Group % Unemployed (lagged, mean-cent)	0.011		−0.007	
	(−0.004–0.026)		(−0.033–0.019)	
[Macro] Unemployment rate (lagged, mean-cent)		0.005***		0.009***
		(0.002–0.008)		(0.005–0.013)
None*Ref. Group % Unemployed (lagged, mean-cent)	−0.014		0.016	
	(−0.031–0.003)		(−0.010–0.041)	
Some recent*Ref. Group % Unemployed (lagged, mean-cent)	−0.005		−0.003	
	(−0.013–0.004)		(−0.022–0.015)	
High in the past *Ref. Group % Unemployed (lagged, mean-cent)	−0.020*		0.053	
	(−0.041–0.002)		(−0.014–0.119)	
High recent*Ref. Group % Unemployed (lagged, mean-cent)	−0.004		−0.009	
	(−0.022–0.014)		(−0.043–0.025)	
None*Unemployment rate (lagged, mean-cent)		−0.004**		−0.006***
		(−0.008–−0.001)		(−0.009–−0.004)
Some recent *Unemployment rate (lagged, mean-cent)		−0.005**		−0.010***
		(−0.010–−0.001)		(−0.013–−0.008)
High in the past *Unemployment rate (lagged, mean-cent)		−0.004*		−0.009**
		(−0.008–0.000)		(−0.017–−0.000)
High recent*Unemployment rate (lagged, mean-cent)		−0.002		−0.009***
		(−0.006–0.002)		(−0.013–−0.005)
Social origin (Ref: Native)				
Migrant	0.019*	0.020*	0.014	0.017*
	(−0.004–0.041)	(−0.001–0.041)	(−0.006–0.035)	(−0.000–0.034)
Country group (Ref: Continental)				
Eastern/Baltic	0.003	−0.003	−0.047	−0.049
	(−0.029–0.034)	(−0.033–0.027)	(−0.151–0.058)	(−0.151–0.053)
Nordic	0.048**	0.053***	0.101*	0.105**

Table 6 (continued)

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Less than Tertiary education		Tertiary education	
	(0.012–0.085)	(0.014–0.091)	(−0.000–0.202)	(0.003–0.207)
Southern	−0.028	−0.029	−0.086*	−0.091*
	(−0.068–0.013)	(−0.069–0.012)	(−0.177–0.005)	(−0.188–0.006)
Liberal	0.048***	0.055***	0.046	0.054
	(0.023–0.072)	(0.026–0.083)	(−0.045–0.136)	(−0.038–0.146)
Previous parity (Ref: Childless)				
Previous parity 1	0.140***	0.140***	0.170***	0.169***
	(0.102–0.177)	(0.102–0.177)	(0.108–0.233)	(0.106–0.232)
Previous parity 2	0.009	0.009	−0.038***	−0.038**
	(−0.014–0.031)	(−0.014–0.031)	(−0.065–−0.011)	(−0.067–−0.009)
Age of respondent	−0.003***	−0.003***	0.004**	0.004**
	(−0.005–−0.001)	(−0.005–−0.001)	(0.000–0.008)	(0.000–0.008)
Age of respondent squared	−0.001***	−0.001***	−0.001***	−0.001***
	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)	(−0.002–−0.001)
Year (Ref: 2006)				
2008	0.005	0.005	0.025	0.023
	(−0.008–0.017)	(−0.007–0.018)	(−0.031–0.081)	(−0.035–0.081)
2010	0.015**	0.018***	0.004	0.006
	(0.002–0.029)	(0.007–0.030)	(−0.032–0.040)	(−0.033–0.044)
2012	−0.017	−0.012	−0.029	−0.020
	(−0.122–0.089)	(−0.115–0.090)	(−0.178–0.119)	(−0.164–0.125)
2014	0.017	0.021	0.037	0.049
	(−0.041–0.075)	(−0.043–0.084)	(−0.039–0.113)	(−0.021–0.119)
2016	−0.009	−0.005	−0.036	−0.032
	(−0.045–0.028)	(−0.047–0.037)	(−0.157–0.084)	(−0.158–0.094)
2018	−0.005	−0.001	−0.002	0.000
	(−0.032–0.022)	(−0.032–0.030)	(−0.091–0.087)	(−0.098–0.098)
2021	0.021	0.027	−0.043	−0.038
	(−0.016–0.058)	(−0.008–0.061)	(−0.130–0.045)	(−0.135–0.059)
2023	−0.012	−0.006	−0.054***	−0.052**
	(−0.044–0.020)	(−0.046–0.033)	(−0.091–−0.017)	(−0.099–−0.004)
Country group x Year interaction	YES	YES	YES	YES
Constant	0.042	0.077***	0.205**	0.088*
	(−0.053–0.137)	(0.025–0.129)	(0.030–0.380)	(−0.010–0.185)
Observations	25,142	25,142	12,825	12,825
R-squared	0.047	0.047	0.077	0.077

Table 7 Childbirth probability by micro-meso-levels and micro–macro-levels labor market uncertainty interaction by education. Linear probability model. Women. Source: Authors' elaboration based on ESS (2004–2023). Note: Standard errors clustered at the country level. 95% confidence intervals

	Model	Model	Model	Model
	(1)	(2)	(3)	(4)
	Less than Tertiary education		Tertiary education	
[Micro] Labor market uncertainty (Ref: Some in the past)				
None	−0.100	−0.014	0.051	0.004
	(−0.328–0.128)	(−0.069–0.040)	(−0.109–0.211)	(−0.058–0.066)
Some recent	−0.163*	−0.059	0.010	−0.028
	(−0.333–0.007)	(−0.143–0.024)	(−0.137–0.157)	(−0.093–0.037)
High in the past	−0.176*	−0.072***	−0.149	−0.115**
	(−0.372–0.021)	(−0.125–−0.019)	(−0.340–0.041)	(−0.215–−0.014)
High recent	−0.118**	−0.071***	−0.012	−0.030
	(−0.212–−0.023)	(−0.115–−0.028)	(−0.199–0.174)	(−0.086–0.026)
[Meso] Ref. Group % Unemployed (lagged, mean-cent)	−0.005		−0.007	
	(−0.026–0.015)		(−0.040–0.027)	
[Macro] Unemployment rate (lagged, mean-cent)		0.002		0.002
		(−0.003–0.007)		(−0.004–0.008)
None*Ref. Group % Unemployed (lagged, mean-cent)	0.012		−0.007	
	(−0.018–0.043)		(−0.034–0.020)	
Some recent*Ref. Group % Unemployed (lagged, mean-cent)	0.016		−0.006	
	(−0.005–0.037)		(−0.028–0.016)	
High in the past *Ref. Group % Unemployed (lagged, mean-cent)	0.022		0.019	
	(−0.006–0.050)		(−0.010–0.049)	
High recent*Ref. Group % Unemployed (lagged, mean-cent)	0.011*		−0.000	
	(−0.001–0.023)		(−0.028–0.028)	
None*Unemployment rate (lagged, mean-cent)		−0.000		0.000
		(−0.005–0.005)		(−0.006–0.007)
Some recent *Unemployment rate (lagged, mean-cent)		0.001		0.000
		(−0.005–0.007)		(−0.005–0.005)
High in the past *Unemployment rate (lagged, mean-cent)		0.006**		0.009*
		(0.000–0.011)		(−0.002–0.019)
High recent*Unemployment rate (lagged, mean-cent)		0.003		0.002
		(−0.001–0.007)		(−0.002–0.006)
Social origin (Ref: Native)				
Migrant	0.006	0.013	−0.002	−0.008
	(−0.014–0.027)	(−0.007–0.033)	(−0.029–0.026)	(−0.029–0.013)
Country group (Ref: Continental)				
Eastern/Baltic	−0.050***	−0.063***	−0.079*	−0.083**
	(−0.082–−0.017)	(−0.098–−0.028)	(−0.160–0.003)	(−0.158–−0.009)
Nordic	0.005	0.010	0.011	0.020
	(−0.035–0.044)	(−0.032–0.052)	(−0.051–0.072)	(−0.048–0.088)

Table 7 (continued)

	Model (1)	Model (2)	Model (3)	Model (4)
	Less than Tertiary education		Tertiary education	
Southern	−0.003	−0.006	−0.095***	−0.092**
	(−0.070–0.064)	(−0.067–0.054)	(−0.160–−0.031)	(−0.160–−0.023)
Liberal	0.046***	0.056***	−0.003	0.009
	(0.025–0.067)	(0.033–0.079)	(−0.061–0.056)	(−0.059–0.077)
Previous parity (Ref: Childless)				
Previous parity 1	0.075***	0.075***	0.112***	0.113***
	(0.045–0.105)	(0.046–0.105)	(0.058–0.167)	(0.059–0.167)
Previous parity 2	−0.030***	−0.030***	−0.051***	−0.051***
	(−0.041–−0.019)	(−0.041–−0.019)	(−0.080–−0.021)	(−0.080–−0.022)
Age of respondent	−0.009***	−0.009***	−0.000	−0.000
	(−0.012–−0.006)	(−0.012–−0.006)	(−0.004–0.003)	(−0.004–0.004)
Age of respondent squared	−0.001***	−0.001***	−0.002***	−0.002***
	(−0.001–−0.001)	(−0.001–−0.001)	(−0.002–−0.002)	(−0.002–−0.002)
Year (Ref: 2006)				
2008	0.002	0.000	−0.028*	−0.016
	(−0.039–0.043)	(−0.039–0.040)	(−0.060–0.005)	(−0.045–0.012)
2010	−0.025**	−0.022**	−0.053	−0.044
	(−0.043–−0.006)	(−0.039–−0.005)	(−0.118–0.013)	(−0.116–0.029)
2012	−0.006	0.005	−0.028	−0.033
	(−0.054–0.042)	(−0.039–0.048)	(−0.134–0.077)	(−0.152–0.087)
2014	0.018	0.032	0.001	−0.011
	(−0.022–0.057)	(−0.008–0.072)	(−0.051–0.054)	(−0.044–0.021)
2016	−0.013	−0.009	−0.067**	−0.062**
	(−0.033–0.008)	(−0.022–0.005)	(−0.117–−0.017)	(−0.120–−0.003)
2018	−0.026**	−0.023*	−0.045**	−0.032
	(−0.050–−0.003)	(−0.049–0.003)	(−0.082–−0.008)	(−0.077–0.013)
2021	0.003	0.009	−0.051	−0.034
	(−0.018–0.024)	(−0.014–0.031)	(−0.132–0.029)	(−0.127–0.059)
2023	−0.013	−0.009	−0.116***	−0.094***
	(−0.045–0.020)	(−0.046–0.027)	(−0.173–−0.059)	(−0.157–−0.031)
Country group x Year interaction	YES	YES	YES	YES
Constant	0.208**	0.152***	0.270**	0.211***
	(0.045–0.371)	(0.087–0.216)	(0.046–0.493)	(0.135–0.287)
Observations	23,672	23,672	17,656	17,656
R-squared	0.048	0.048	0.059	0.059

Appendix B

Sensitivity analysis by parity

See Figs. 9, 10 and 11.

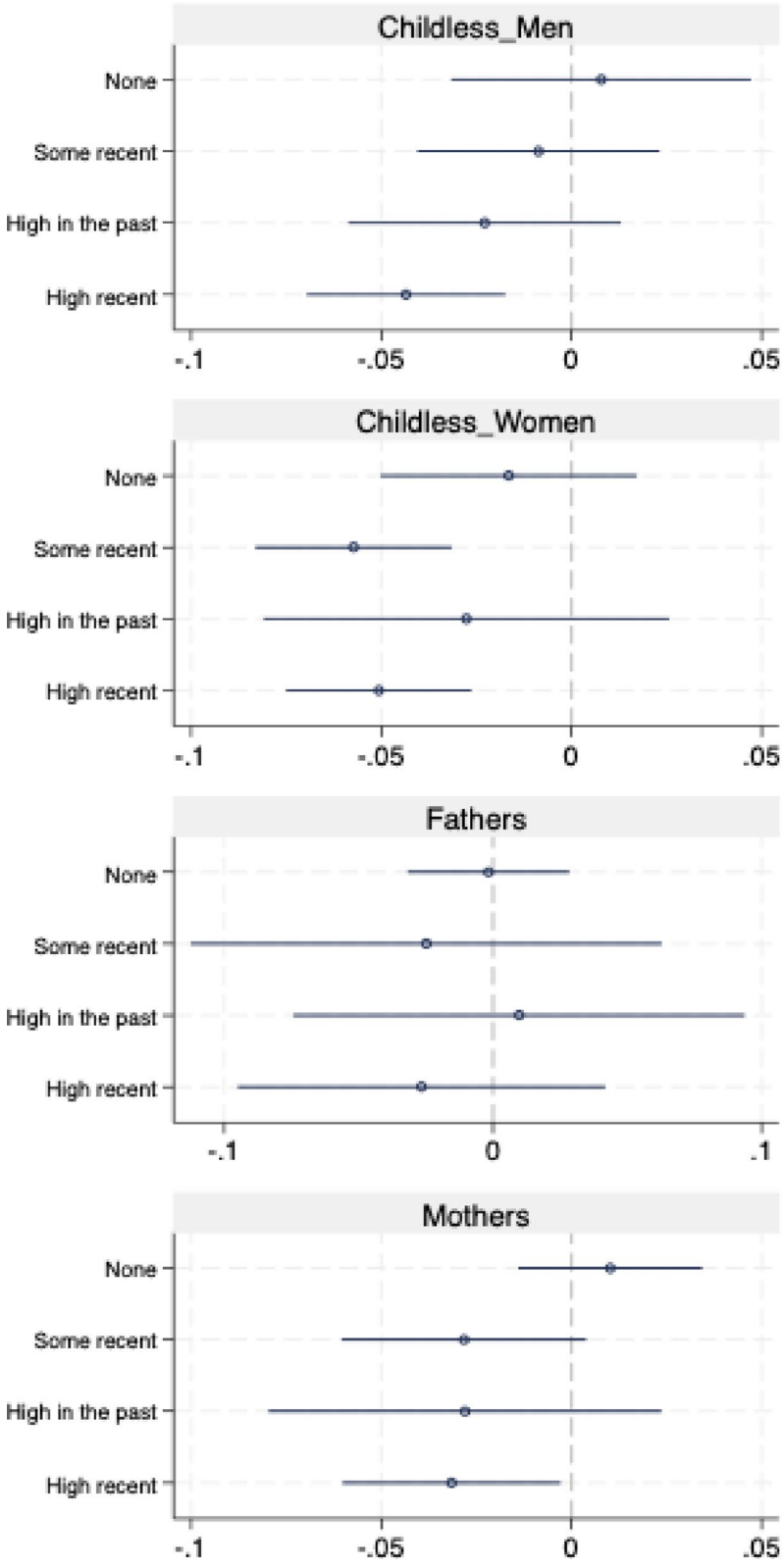

Fig. 9 Average Marginal Effects of micro-level labor market uncertainty by parity. Source: Authors' elaboration based on ESS (2004–2023). Note: Reference category of labor market uncertainty: Some in the past. Standard errors clustered at the country level. 95% confidence intervals

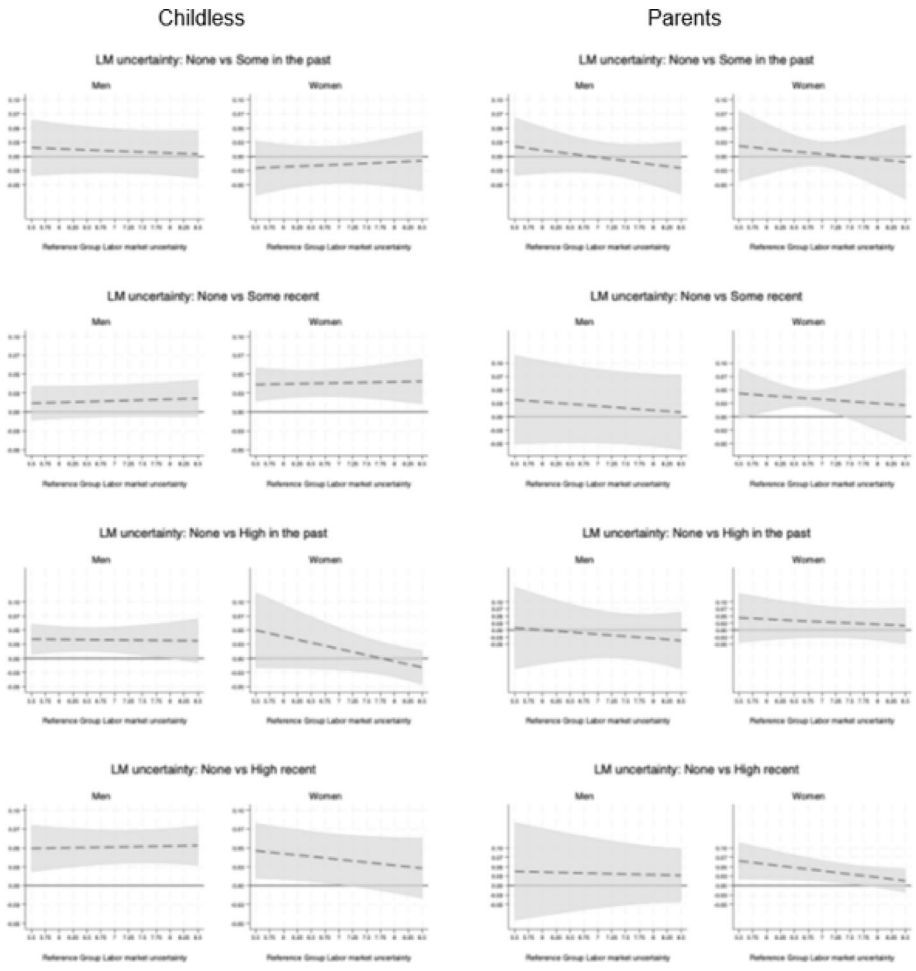

Fig. 10 Average Marginal Effects of micro- by meso-level Labor market uncertainty by gender and parity. Source: Authors' elaboration based on ESS (2004–2023). Note: Standard errors clustered at the country level. 95% confidence intervals

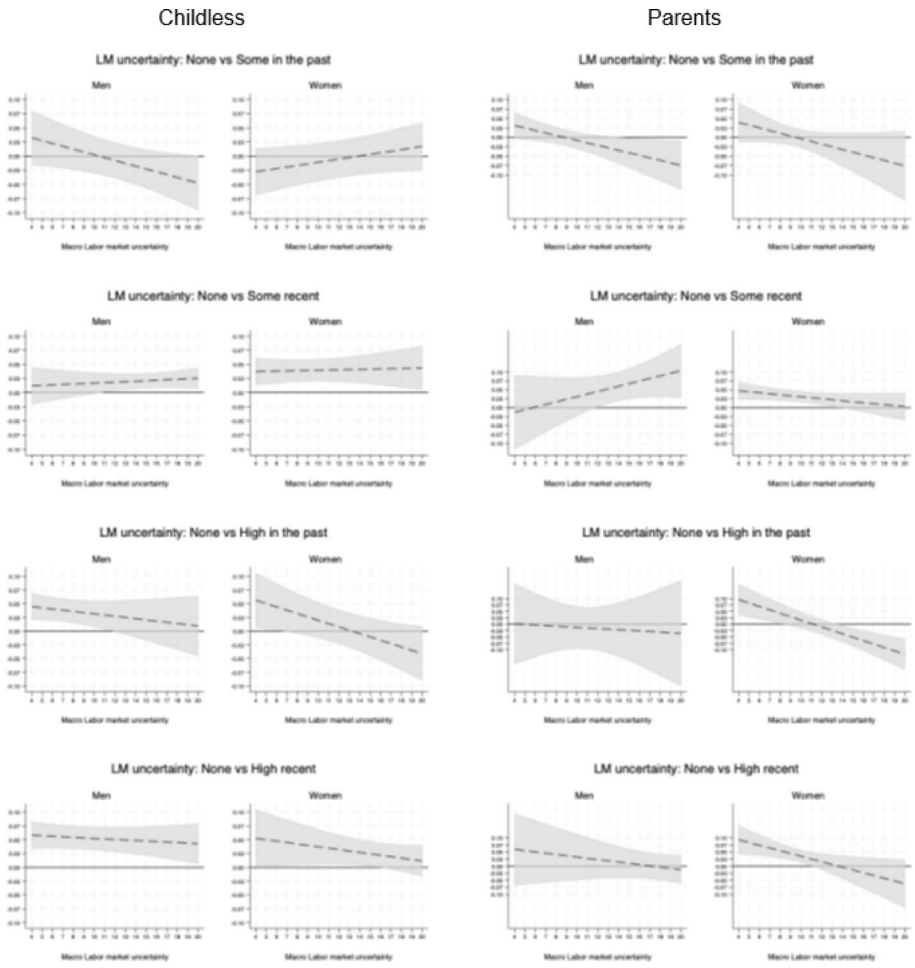

Fig. 11 Average Marginal Effects of micro- by macro-level Labor market uncertainty by gender and parity

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Author contributions
C.L.C. and M.A. conceived the paper; C.L.C. analyzed the data with contributions from M.A., C.L.C. reviewed the relevant literature and created the tables and figures; C.L.C. and M.A. wrote the paper. All authors read and approved the final manuscript.

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Data availability
The paper uses publicly available data from https://www.europeansocialsurvey.org/. The replication code for the analyses will be published along with the final version of the paper.

Declarations

Competing interests
The authors have no competing interests to declare.

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