Population and Environment (2025) 47:31
https://doi.org/10.1007/s11111-025-00501-x

ORIGINAL PAPER

Too worried about the environment to have children? Or more worried about the environment after having children?

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Accepted: 25 June 2025 / Published online: 17 July 2025

Abstract

Amid rising concerns about climate change, in recent years, demographers have increasingly examined whether environmental concerns have become a factor in shaping reproductive intentions and outcomes. However, little is still known about the potentially reciprocal relationship between environmental concerns and fertility, in part due to the lack of longitudinal analyses of sufficient temporal scope. Our study provides new results based on unique data from the German Socio-Economic Panel (GSOEP), which contains both full fertility histories and yearly (1984 to 2020) measurements of environmental concern. We follow individuals born between 1965 and 2000 and investigate (a) whether environmental concerns predict first-birth quantum and timing and (b) whether environmental concern trajectories vary between eventual parents and the childless. Overall, results indicate no significant link between environmental concerns—whether early in life or across the life course—and (the timing of) the transition to parenthood, or the number of children achieved by age 40. However, we find a negative association between environmental concerns and the chances of becoming a parent for older birth cohorts, suggesting a potential generational shift in how ecological awareness intersects with fertility decisions. Moreover, parents seem to be more worried about the environment than the childless, though these differences seem to be largely explained by unobserved heterogeneity rather than parenthood itself.

Keywords Fertility · Birth histories · Transition to parenthood · Environmental concern trajectories

Introduction

Climate change has been an issue of increasing concern for several decades. As the growth of human populations and their consumption levels are closely intertwined with greenhouse gas emissions, global warming has become an important

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theme in demography (van Dalen & Henkens, 2021). The specific association between the environment and fertility has been considered in previous research, with a particular focus on the impacts of environmental shocks on reproductive outcomes (Sellers, 2022). However, the role of individual environmental concerns in human fertility remains underexplored, especially with regard to examining fertility behavior from a longitudinal perspective.

Concern for the environment to a large extent results from the fact that climate change may bring risks that humans do not yet know how to face. The uncertainty and risks related to the consequences of climate change potentially affect social behaviors in the "risk society" (Beck, 1992; Giddens, 2003). For instance, research on voting behavior suggests that experiences of climate impacts raise environmental concerns and promote voting for Green Parties (Hoffmann et al., 2022). But environmental concerns, as an important aspect of the psychological adaptation to climate change (Helm et al., 2018), might also be linked to human reproduction.

A recent strand of research emphasizes potential connections between environmental attitudes and reproductive decision-making. In particular, various studies investigate how climate change concerns may impact fertility intentions. Arnocky and colleagues (2012), for example, find a negative relationship between environmental concerns and fertility intentions among Canadian students. De Rose and Testa (2015) observe a small but significant positive relationship between climate concerns and fertility intentions in a European sample. More recently, Bastianelli (2025) finds worries about climate change to be significantly related to intentions of remaining childless in three European countries.

Other studies have examined linkages between climate change concerns and fertility desires or general reproductive motivations. Schneider-Mayerson and Leong (2020), for example, find high levels of concern regarding the carbon footprint of reproduction and the future well-being of their offspring. Moreover, Rackin et al. (2022) report that US high school students desiring political action for environmental protection have lower fertility desires. If young couples worry about future environmental degradation or environmentally induced conflict, they may be reluctant to procreate out of concern that their potential offspring will experience hardship (Bergs-Winkels et al., 1996).

Studies on the relationship between environmental concerns and fertility realizations are harder to find. Two recent exceptions include the work of Powdthavee et al. (2024) as well as that of Golovina and Jokela (2024). The former note that environmentally unconcerned individuals in the UK are more likely to become parents over the next 6 years. Similarly, the study by Golovina and Jokela (2024), which relies on the same data from the German Socio-Economic Panel (GSOEP) as the present study, finds a negative relationship between feelings of uncertainty and the likelihood of having children. However, this study does not investigate environmental worries in isolation but rather combines these with other social concerns using exploratory factor analysis. The important additional question on the potential impact of environmental concerns on fertility timing remains unanswered in both studies. Ivanova and Balbo (2024) demonstrate that perceiving the future of the coming generation as worse than the present is associated with a

lower probability of becoming a parent, suggesting that individuals' perceptions of the future are as important as perceptions of current conditions as predictors of fertility behavior.

A major obstacle to investigating the hypothesized reciprocal relationship between environmental concerns and fertility behavior is the need for sufficiently long panel data. Time series on environmental concerns are scarce and usually short-spanned, e.g., the impact of parenthood on environmental concerns has been studied based on data of only 4 (Thomas et al., 2018) or 7 years (Milfont et al., 2020). One recent study makes use of the GSOEP data collection from 1984 to 2020 but focuses on environmental concerns in the short- to mid-term (i.e., around childbirth) (Zoch & Kapelle, 2025). In the long term, the potential impacts of parenthood on environmental concerns might change, especially because concerns might be perceived only once parents have passed their "Rush Hour of Life" and because the adolescent children start advocating actively on behalf of the environment in the parental home (Lawson et al., 2019).

In this study, we overcome previous studies' limitations by using unique longitudinal data from GSOEP, containing full fertility histories and one yearly measure of environmental concern. While the respective survey item is very generic and modern environmental psychology differentiates multiple dimensions of environmental attitudes (Milfont & Duckitt, 2010), it is available since the beginning of GSOEP (1984–2020). These data therefore allow us to study whether environmental concerns predict the transition to parenthood and/or whether becoming a parent affects environmental concerns in the long run. To the best of our knowledge, this is the first study to do so. We examine the extent to which environmental concerns in younger adulthood (16–23 years) predict parenthood by age 40. Additionally, we look at the fertility risks over time depending on time-varying environmental concerns and environmental concern trajectories over the life course by parental status.

Background

Fertility trends and environmental concerns over time in Germany

Germany is particularly interesting for studying the association between environmental concerns and fertility for various reasons. Germany is unique in its political development, as East and West Germany have been exposed to very different political influences after World War II and before being reunified in 1990. After reunification, East Germany has adopted most West German policies, which has led to some convergences between these two regions. However, essential differences have remained, including in their economies (Blien et al., 2016), attitudes towards maternal employment (Zoch, 2021), and environmental concerns (Hartmann & Preisendörfer, 2021). Additionally, fertility differed significantly, in particular around German reunification. For instance, the mean age at first birth has almost consistently increased in West Germany since the mid-1970s (26.7 years in 1974; 31.2 years in 2017) (Human Fertility Database, 2019b). The average age at first birth in East Germany has been much lower,

reaching around 25 years in the late 1980 s and increasing from the mid-1990s up to 29.9 years in 2017 (Human Fertility Database, 2019a). Major differences have also been observed regarding the total fertility rate, in particular shortly after reunification, when East German levels drastically dropped below 1, converging to West German levels afterwards (Goldstein & Kreyenfeld, 2011).

Regional differences have also characterized subjective environmental concerns across Germany, albeit to a much lesser degree than in the case of fertility. Recent research has shown that levels are similar in East and West Germany, with slightly bigger concerns prevailing in West Germany (Hartmann & Preisendörfer, 2021). Larger variation has certainly been observed over time, with levels of environmental concern responding strongly to protests against nuclear energy and other environmental questions. In the early years of GSOEP (1984–1989), many respondents reported having environmental concerns, as the accumulated damages to forests due to air pollution and subsequent acid rain received considerable attention and contributed to strong environmental awareness throughout Germany (Fowler et al., 2020; OECD, 2000). In 1986, the Chernobyl disaster in Ukraine further added to growing environmental concerns, although the effect was short-lived (Berger, 2010). These events contributed to the broadening acceptance of the political Green Party (Hartmann & Preisendörfer, 2021). Accordingly, the share of GSOEP respondents who reported having major environmental concerns reached an all-time high in 1989 (62%) before decreasing substantially after German reunification (23% in 1999) (Hartmann & Preisendörfer, 2021).

During the early 2000 s, environmental concerns stabilized at relatively low levels (around 30% reporting major environmental concerns) or increased very slightly, potentially linked to political efforts to transition from traditional energy sources (e.g., nuclear, fossil) to renewable sources (e.g., wind, solar) (Uekötter, 2017). A surge in concerns reported in 2007 may be partly explained by the release of the documentary "An Inconvenient Truth," which triggered an intensified debate about climate change in Germany (Schipperges, 2020). Similar to Chernobyl, the 2011 Fukushima disaster in Japan led to a temporary increase in environmental concerns before political interventions were announced (Goebel et al., 2015). However, levels of concern about the environment have recently risen again in Germany (46% in 2019, Hartmann & Preisendörfer, 2021), as a consequence of increasing concerns about climate change (Fulda & Hövermann, 2020). Environmental concerns have stayed high despite the Covid-19 pandemic competing for public attention (Gellrich et al., 2021).

Theoretical framework and hypotheses

Part 1: The impact of environmental concerns on childbearing

Several theoretical frameworks address the potential impacts of environment-related causes on fertility (Sellers, 2022). Most of them broadly focus on the role of environmental variability (e.g., the direct effects of environmental shocks) on

subsequent fertility outcomes. The present study examines environmental concerns and, thus, relies on theoretical approaches that address psychological factors affecting fertility behavior. Beck's idea of a "Risk Society" (Beck, 1992) suits the purpose of this study well.

According to Beck and subsequently, Giddens (2003), the future-oriented occupation with risk is a central feature of modern societies, particularly against the backdrop of the ecological crisis that motivates both authors. While human societies have always dealt with exogenously generated risks (e.g., natural disasters), modern societies create those risks endogenously, including as a side product of fossil fuel-based industrial production. But as these "manufactured risks" involve a degree of human agency, they also lead to reflexivity and concern about their potential implications for future generations.

Fertility behavior within the risk society may be examined with the Traits-Desires-Intentions-Behavior (TDIB) model (Miller, 1994, 2011). This model describes the full trajectory of reproductive decision-making from motivational dispositions (e.g., traits) to cognitive constructs (e.g., desires and intentions) to have a child. Desires and intentions, in turn, lead to pregnancy-seeking behavior, and thus, a possible birth. The TDIB model recognizes that "fears and worries of parenthood" (Miller, 1995, p. 476), including various concerns related to the child's future, can affect childbearing outcomes. In the TDIB sequence, environmental concerns are most likely to influence intentions, as traits are stable characteristics and not very responsive to situational factors, desires imply only a minimum consideration for implications (e.g., of having children), whereas intentions reflect deliberate planning given specific circumstances.

These theoretical considerations give reason to assume that environmentally concerned people might be inclined to remain childless, particularly as the pace of climate change accelerates: first, because they want to spare their children a life in agony in a future world that no longer provides the full range of ecosystem services necessary to maintain today's quality of life (Schneider-Mayerson & Leong, 2020);, second, because children represent additional consumers that would potentially contribute to further global warming (Wynes & Nicholas, 2017). Some may consider having fewer children, particularly in wealthy consumerist societies, as part of the solution to many of the problems posed by climate change. Consequently, we hypothesize a negative association between environmental concerns and fertility:

> ***Hypothesis 1a:*** *Environmentally concerned individuals are less likely to enter parenthood.*

While we expect individuals with major environmental concerns to experience lower fertility risk, there is also a timing-related question. Environmentally concerned individuals might feel more obliged to pursue competing goals (e.g., producing the smallest possible carbon footprint), though they may change their fertility preferences later in life, possibly in response to their biological clock (Wagner et al., 2019). This dynamic may result in environmental concerns being less relevant for fertility behavior during later reproductive ages. Hence,

we expect the role of environmental concerns to vary with age. This expectation is in line with recent research showing age-related variation in environmental concerns in Germany (Hartmann & Preisendörfer, 2021) and stronger environment-related emotions for younger compared to older generations in the UK (Poortinga et al., 2023). As a consequence, young people might care more about the environment, climate change, and sustainability than people of advanced childbearing age and might, therefore, refrain from childbearing. However, whether these individuals will remain childless throughout their life courses or whether they postpone fertility until the later stages of their fertile ages remains unanswered.

Additionally, the association between environmental concerns and the transition to parenthood may change across birth cohorts based on the increasing relevance of psychological factors (i.e., non-cognitive abilities, Aldén et al., 2022) for fertility. As argued above, environmental concerns may vary across generations, according to their exposure to major environmental events (e.g., nuclear catastrophes). Therefore, analyses by birth cohorts were conducted. In line with the observed fluctuations in public environmental concerns among Germans (as described in the previous sub-section), we expect negative associations between environmental concerns and fertility, particularly among the oldest and the youngest cohorts in our sample.

> ***Hypothesis 1b:*** *Environmentally concerned individuals have lower first-birth risks over time as they age, and these associations are strongest among older and younger birth cohorts in the sample.*

Moreover, it has been shown that compared to men, women are more likely to perceive (environmental) risks (Olofsson & Rashid, 2011) and generally less likely to deny evidence of climate change (McCright & Dunlap, 2011). Consequently, environmental concerns may play a greater role for reproductive decision-making among females than among males. The common explanation for this pattern is social dominance orientation, which makes men feel more empowered and able to act upon potential threats because they are part of a more powerful group within the social hierarchy than women (Jylhä et al., 2016). Following this literature, we hypothesize that the fertility behavior of women will be more affected by environmental concerns than that of men:

> ***Hypothesis 1c:*** *The hypothesized associations between environmental concern and fertility are stronger among women.*

Part 2: Parenthood and environmental concerns

The carbon cost of childbearing is generally thought to be positive and sizable (Wynes & Nicholas, 2017). However, while parents may differ from non-parents already in their baseline levels of environmental concerns (i.e., before childbirth), there are reasons to believe that parenthood itself might lead to shifts in environmental attitudes, trigger pro-environmental behaviors, and thus contribute positively

to climate change mitigation. One of those reasons is psychological distance (Liberman & Trope, 2008; Spence et al., 2012), caused by the feeling that the worst effects of climate change will not emerge until sometime in the distant future, thus affecting future generations (Fesenfeld & Rinscheid, 2021). Those future generations do not contain direct descendants for people without children, but parents typically cohabit with potential future victims of climate change impacts. This connection might reduce psychological distance significantly and increase the likelihood of shifts towards pro-environmental behaviors among parents (Lawson et al., 2019; Milfont et al., 2012). Consequently, the possibility of environmental problems being passed on to future generations may play a key role in shaping the relationship between fertility and environmental concerns.

A second reason why psychological distance to environmental problems might be smaller within families is provided by the "legacy hypothesis" (Thomas et al., 2018). To secure a high quality of life for their child(ren) beyond their lifetime, parents might not just want to endow their offspring with the necessary financial means but also bequeath them a high-quality environment. Consequently, having children might increase levels of environmental concern. However, the few existing studies are either constrained by small, cross-sectional samples (e.g., Grønhøj & Thøgersen, 2017; Lawson et al., 2019), or only look at a relatively short period in the lives of young parents (Milfont et al., 2020; Thomas et al., 2018).

Hence, prior results are mixed. For instance, Thomas et al. (2018) followed individuals for up to 24 months after the transition to parenthood, when most parents likely still struggle with the adjustment to parenthood rather than concerns for the environment. In the longer run, both the direction and size of the parenthood effect could change. In a more recent study based on a slightly longer panel (2009–2015), Milfont and colleagues (2020) find that while parenthood may make people more aware of climate change, it does not affect their environmental attitudes. In the present study, we test the legacy hypothesis using longitudinal data covering a much longer time span than previous studies on the subject:

> ***Hypothesis 2a:*** *Parents are more likely to be concerned about the environment than non-parents.*

Previous research has also argued that parenthood may affect people's environmental concerns differently depending on gender. Women are assumed to care more about the environment after childbirth (Thomas et al., 2018), as they may share stronger concerns about the health of their children, while fathers may be more concerned about their financial well-being. This idea has been discussed in the literature for several decades (Blocker & Eckberg, 1989; Hamilton, 1985), most recently as the "eco-mom hypothesis" (Price & Bohon, 2019), according to which mothers have greater environmental concerns after entering parenthood. Formulating the corresponding hypothesis on fathers appears difficult, though, given the lack of distinct patterns from previous research:

> ***Hypothesis 2b:*** *Environmental concerns increase among mothers (compared to non-mothers), while trends among fathers (compared to non-fathers) remain uncertain.*

Data and methods

To overcome the problems related to short time series, we base our analyses on data from GSOEP. GSOEP has been conducted annually since 1984, with the waves before 1991 including only West Germans. We restrict the observation period to 1984–2020, as the Covid pandemic may have biased or changed the association between environmental concerns and fertility in more recent years in ways that go beyond the scope of this study (see also Golovina & Jokela, 2024). Moreover, we explicitly control for differences between East and West Germany in our empirical analyses (see description of control variables below) to account for the discontinuity in the sample due to Germany's reunification.

Each year, approximately 30,000 individuals from around 14,000 households participate in GSOEP (Siegers et al., 2019). The selection of these participants aims to represent Germany's resident population. To maintain the cross-sectional representativeness despite changes in the German population (e.g., due to immigration), as well as panel attrition, GSOEP uses regular refreshment samples drawn from the residential population (Goebel et al., 2019). We use the GSOEP-Core data v37, which includes all subsamples from sample A-M8, weighted for representativity (Siegers et al., 2022). Apart from demographic information (e.g., age, sex, socioeconomic characteristics, timing and quantum of fertility), GSOEP covers a variety of attitudinal items. Most importantly for our purposes, GSOEP provides information on people's environmental concerns since its launch in 1984.

Two separate kinds of analyses are conducted: First, we explore whether environmental concerns may predict childbearing. For this purpose, we examine the prospective association between environmental concerns measured in young adulthood (ages 16–23) and parental status by age 40 and the longitudinal association between environmental concerns and fertility over time. Second, we investigate environmental concerns by parental status, as well as over the parental lifespan.

Sample

We use three different samples of varying sample size, depending on the type of analysis conducted. Although the GSOEP data aims for representativeness of the German population, our analytical samples are not representative due to different restrictions. For instance, analyses on parenthood by age 40 are based on a sample that has been observed for at least 20 waves since age 20 or younger, with information on environmental concerns being taken from young adulthood. This analytic sample includes 833 respondents. Childbearing after age 40 was relatively rare in our sample. Only 1% of the participants entered parenthood after age 40 (88% by age 35). This is in line with research showing that parity does not change for most people after age 40 for both genders (Nisén et al., 2014). Additional analyses using the sample that experienced parenthood by age 35 (1302 individuals that were observed until age 35 and higher) revealed patterns similar to those obtained from our initial sample.

We also examine the potential impact of individuals' changing environmental concerns on their first-birth risks over time. The analytical sample for examining

these relationships consists of 6730 initially childless individuals who were followed from age 20 or younger until the birth of their first child (1488 first births were recorded between 1986 and 2020), age 40 (assumed end of the reproductive lifespan), or the last observation, whichever comes first. This amounts to a total of 41,541 observations.

The second part of the empirical analysis deals with changes over time in environmental concerns by parental status (i.e., we compare childless individuals to parents). Environmental trajectories are again based on the sample consisting of individuals who were aged 20 or younger when they first participated in the survey. Respondents were followed for at least 20 waves of GSOEP, leading to a total of 33,148 observations over time. However, we do not restrict the sample to participants who were at least 40 years old at last observation. This leaves us with an analytical sample of 1302 individuals (instead of 833 from above).

Environmental concerns

Environmental concerns not only are included as the main explanatory variable in our fertility models, but also form the dependent variable for our analyses predicting attitudinal changes in relation to fertility. The survey item on environmental concerns belongs to a battery of questions on concerns about several social problems that are captured in GSOEP, such as concerns about the general economic development or crime rates in Germany. Participants were asked: "And what about the following fields – do you have concerns?". Respondents could report being either "very concerned," "somewhat concerned," or "not concerned at all" about the protection of the environment. This item does not provide a definition of "environment," and "concern" is not the only attitudinal pathway between environment and fertility (Milfont & Duckitt, 2010). However, the survey item is available throughout the entire observation period and has remained unchanged.

For our analyses on both fertility risks and environmental trajectories, we dichotomize environmental concerns for two reasons. First, social psychology research suggests that the strength of an attitude matters for predicting different outcomes (Ajzen, 2001; Howe & Krosnick, 2017). Therefore, it appears reasonable to differentiate between "some" and "major concerns." Second, the number of respondents who reported having "no concerns" was rather small in all years. Thus, we combine this group with individuals who reported having only some concerns and obtain a dummy variable (0 "no/some concerns," 1 "big concerns"). This implies some loss of information in exchange for gaining more robust categories.

Environmental concerns may be sensitive to period-specific events (e.g., the Chernobyl catastrophe in 1986) and cause outliers in individual years. Moreover, concerns tend to be volatile during the formative years (Pöge, 2020; Striessnig & Lutz, 2016). Therefore, relying on the answer from just a single year to identify an individual as being either concerned or not could introduce bias and/or misrepresent the person's level of concern during young adulthood. Since this is our main variable in predicting the probability of entering parenthood by age 40, for the prospective analysis, we derive a more robust measure of environmental concern by

calculating the mode from age 16 (when the youngest participants entered GSOEP) to age 23. This rather wide window gives us at least a few observations for those individuals who only joined the survey at, for instance, age 20. To test the sensitivity of this window, we tested alternative age intervals (e.g., ages 20–25). The results were similar. When analyzing the influence of environmental concerns on childbearing over time, we allow environmental concerns to vary across years. To prevent bias in concerns due to known pregnancies or experienced births, we lag time-varying environmental concerns by 1 year.

Control variables

In our analysis of parenthood by age 40, we control for several covariates based on previous research. For instance, women and highly educated individuals tend to be more concerned about the environment and have lower fertility rates (Hartmann & Preisendörfer, 2021; Sobotka et al., 2017). Therefore, we include gender ("female," "male") and highest educational attainment according to the International Standard Classification of Education (ISCED, version of 1997) ("inadequate," "general elementary," "middle vocational," "vocational + Abi (high school)," "higher vocational," "higher education") in the analyses. Since married couples generally have higher fertility rates than cohabiting couples (Baizán et al., 2004), models control for civil status ("single," "cohabiting," "married," "divorced/widowed"). Note that non-cohabiting couples are also coded as "single" within GSOEP (Hamjediers et al., 2020).

Environmental concerns and fertility rates may further differ by the place of residence (e.g., between East and West Germany) (BiB, 2022; Hartmann & Preisendörfer, 2021). West Germans perceive climate change as a problem to a larger extent than East Germans (Federal Agency for Civic Education, 2021) but report a better state of the environment in Germany (Gellrich et al., 2021). Environmental concerns, however, do not differ much between East and West Germans (Hartmann & Preisendörfer, 2021). Fertility levels in East and West differed markedly in the 1980's and 1990's but have converged in recent years (BiB, 2022). Consequently, in our models, we are controlling for region ("east," "west"), as well as type of residence ("rural," "urban"), which has been shown to affect both local environmental indicators and fertility decisions (Klineberg et al., 1998; Huddart-Kennedy et al., 2009). Information was taken from the last available observation. We also considered classifying observations by "place of origin" instead. However, due to a large number of missing responses, we opted for place of residence.

Analyses of fertility risks over time additionally control for income (standardized logarithm of individual gross income in the previous year), as higher incomes are associated with lower fertility, although this association has shown variability over time and social context (Bar et al., 2018; Córdoba & Ripoll, 2016). Moreover, models control for the participant's birth year (1965–2000) and age at baseline (in months). Education (as above, but including "in school"), civil status, income, region, and type of residence are allowed to vary over time. In order to avoid biases due to pregnancies that were ongoing at the time of the survey, we take information on these variables from the previous

year (time-lagged). Given that we consider information from year *t*–1 and that type of residence ("rural," "urban") is not available before 1985, we are restricted to first childbirths from 1986 onward.

The final part of our analysis is dedicated to trajectories of environmental concerns. It also controls for gender, highest educational attainment, region, and type of residence. Additionally, we control for parental status in a given year ("no parenthood (yet)," "parenthood"), calendar year (in 5-year groups), and age (in years).

Models

To answer the question of whether early-life environmental concerns predict future childbearing, we run logistic regression models relating the "initial" level of concern (statistical mode between ages 16 and 23) to the "eventual" level of fertility measured at age 40, including an interaction effect between environmental concerns and gender. This model can be described as:

$$ln\left(\frac{P_i}{1-P_i}\right) = a + b_1 env_{mode} + b_2 gender + b_3 edu + b_4 civil + b_5 resid + b_6 region \tag{1}$$

as well as including an interaction effect between environmental concerns and gender:

$$\begin{aligned} ln\left(\frac{P_i}{1-P_i}\right) = a + b_1 env_{mode} + b_2 gender + b_3 edu + b_4 civil + b_5 resid \\ + b_6 region + b_7 env_{mode} * gender \end{aligned} \tag{2}$$

where the log-odds of being a parent by age 40 are the sum of the model intercept a and the set of explanatories, which are multiplied by the corresponding coefficients $b_1 \ldots b_6$. The variable *env* represents the mode of dichotomized environmental concern between ages 16 and 23. Furthermore, we control for the respondent's *gender*, highest educational attainment (*edu*), partnership status (*civil*), type of residence (*resid*), and *region* (East or West Germany).

To study the impact of concerns on fertility risks, we employ piecewise-constant hazard models, which are widely used in fertility research (e.g., Bengtsson & Dribe, 2014; Mussino & Strozza, 2012). These models take the form of:

$$\begin{aligned} h_{ij}(t|x_i) = \lambda_j exp(b_1 env_{t-1} + b_2 gender + b_3 edu_{t-1} + b_4 civil_{t-1} + b_5 resid_{t-1} \\ + b_6 region_{t-1} + b_7 birthyear + b_8 age\_baseline + b_9 income_{t-1}) \end{aligned} \tag{3}$$

and including an interaction between environmental concerns and birth cohort groups:

$$\begin{aligned} h_{ij}(t|x_i) = \lambda_j exp(b_1 env_{t-1} + b_2 cohortgroup_t + b_3 gender + b_4 edu_{t-1} \\ + b_5 civil_{t-1} + b_6 resid_{t-1} + b_7 region_{t-1} + b_8 age_{baseline} + b_9 income_{t-1} \\ + b_{10} env_{t-1} * cohortgroup_t) \end{aligned} \tag{4}$$

The hazard h for each individual i within time interval j depends on time t and the set of explanatories x. The factor λ represents the period-specific baseline hazard. It is multiplied by the exponentiated sum of explanatory variables that are multiplied by the coefficients $b_1 \ldots b_9$. The explanatory variables are identical to those in Eqs. (1) and (2) but extended by including the factors *birthyear* (year of birth of respondent), *age at baseline* (in months), and *income* (standardized logarithm). Environmental concerns, education, civil status, type of residence, region, and income are time-varying and lagged by 1 year. In line with hypotheses #1b and #1c, we conducted models separated by gender and with an interaction between environmental concerns and cohort groups (<1970, 1970–1979, 1980–1989, $>=1990$) (4).

To study the drivers of environmental concerns over time, we again rely on logit models. According to the Hausman test, fixed-effects models controlling for unobserved heterogeneity within individuals over time are more appropriate for our data compared to random-effects (see Supplementary Material SM Table 3). The explanatory variables are time-varying.

$$ln\left(\frac{P_{i,t}}{1-P_{i,t}}\right) = a + b_1 parenthood_{i,t} + b_2 age_{i,t} + b_3 edu_{i,t} + b_4 year_{i,t} + b_5 resid_{i,t} + b_6 region_{i,t} + b_7 parenthood_{i,t} * age_{i,t} + \alpha_i \quad (5)$$

The structure of Eq. (5) is similar to Eq. (1) but expanded by the factor α, which represents the unobserved time-constant variables for each individual i. Next, we also modified Eq. (5) by including an interaction between parenthood and gender in order to address hypothesis #2b. As additional robustness checks, we ran ordered logit models with fixed effects and linear regression models using the original variable on environmental concerns without dichotomization ("very concerned" (1), "somewhat concerned" (2), or "not concerned at all" (3)). The results (available upon request) support those obtained from the logit model.

Results

Descriptive statistics

Table 1 shows absolute and relative frequencies for all variables used in the fertility analyses. The upper part displays statistics for the sample consisting of 833 individuals used in the analysis of parenthood by age 40. Roughly 60% of respondents in this sample reported having major concerns most frequently when they were aged 16–23. Almost half of the sample had obtained middle vocational education (48%) by the last observation, and the majority (57%) were not living with a partner.

On the bottom part, Table 1 shows univariate statistics for the sample used for the event-history analyses. This sample contains 6730 individuals with 41,541 observations. Descriptive statistics are reported at baseline when individuals first entered the survey, irrespective of the survey time. Most individuals in this sample were

Table 1 Descriptive statistics fertility analyses (#1)

Logit models, at last observation (#1a)			*Event-history analyses, at baseline (#1b)*				
Variable	**N**	**%**	**Variable**	**N**	**%**		
Envir. Concerns (Mode 16-23 years)			*Environmental Concerns*				
No/Some	335	40.22	No/Some	4,502	66.89		
Big	498	59.78	Big	2,228	33.11		
Gender			*Gender*				
Females	440	52.82	Females	3,303	49.08		
Males	393	47.18	Males	3,427	50.92		
Education (at last observation)			*Education*				
Inadequately	10	1.20	In School	1,316	19.55		
General Elemantary	64	7.68	Inadequately	120	1.78		
Middle Vocational	400	48.02	General Elemantary	3,106	46.15		
Vocational + Abi	71	8.52	Middle Vocational	2,012	29.90		
Higher Vocational	98	11.76	Vocational + Abi	38	0.56		
Higher Education	190	22.81	Higher Vocational	19	0.28		
			Higher Education	119	1.77		
Civil Status							
Single	477	57.26	*Civil Status*				
Cohabited	70	8.40	Single	6,444	95.75		
Married	251	30.13	Cohabited	237	3.52		
Divorced/Widowed	35	4.20	Married	44	0.65		
			Divorced/Widowed	5	0.07		
Residence							
Urban	562	67.47	*Residence*				
Rural	271	32.53	Urban	4,328	64.31		
			Rural	2,402	35.69		
Region			*Region*				
West	702	84.27	West	5,321	79.06		
East	131	15.73	East	1,409	20.94		
				Mean	**Std. dev.**	**Min**	**Max**
			Age (years)	17.56	1.02	14.17	20.75
			Income (log)	7.61	1.15	2.56	12.14
			Birth Year	1984.26	9.21	1965	2000
n	833		**n**	6,730	**N**	41,541	

relatively young (17.5 years on average), not cohabiting with a partner (96%), and either in school (20%) or had attained general elementary (46%) or middle vocational education (30%).

Table 2 shows descriptive statistics for the analytic sample that was used to examine environmental trajectories over fertility history. The upper panel of the table shows characteristics from the first observation at young ages, while the bottom panel refers to the last observation at least 20 years later. Of the 1302 respondents, 53% were female and the urban–rural distribution remained relatively stable over time (about two-thirds

from urban areas). While 98% did not have children at first observation, 72% were parents at last observation. Changes in the respondents' educational attainment can also be detected: at baseline, 34% were in school, and 47% had obtained a general elementary school degree as highest education, while at last observation, the majority had reached either middle vocational (45%) or higher (tertiary) education (26%).

Figure 1 shows descriptive statistics of environmental concerns over time in the full GSOEP sample. In line with previous findings (Hartmann & Preisendörfer, 2021), we find changing patterns across time and birth cohorts. The study population reported having big environmental concerns to a large extent (50–60%) between 1985 and 1995, whereas around 30–40% reported having some, and no more than 10% having no concerns about the environment. Concerns have shifted over time from big (around 20–30%) towards some concerns (ca. 60%), while the proportion of people reporting no concerns remained relatively small (10%). In the most recent waves (2018–2020), big environmental concerns have again become more widespread (40–50%). These patterns are also valid for the oldest birth cohorts (<1970) and the middle-aged cohorts (1970–1979). The youngest birth cohorts (>=1980) were observed from the mid-1990s onwards but show similar trends as the overall sample and the older birth cohorts.

Fertility analyses

In a first step, the multivariate analysis examines whether environmental concerns in the early life stage (statistical mode between ages 16 and 23) may predict parenthood by mid-adulthood (age 40). Figure 2 below shows predictive margins on being a parent by age 40 using an interaction between environmental concerns and gender. Findings suggest that women were more likely than men to have transitioned to parenthood. But for both women and men, having major concerns about the environment at younger ages did not significantly affect the likelihood of becoming a parent. While the predicted probabilities are slightly higher among men reporting major concerns during young adulthood (vs. no/some concerns), further analyses based on the contrasts of margins reveal that the point estimates do not differ significantly for both genders (SM Fig. 7). Point estimates and confidence intervals for the other covariates of the model are shown in SM Table 4. Robustness checks using the statistical mode of environmental concerns for ages 20–25 (SM Fig. 8) and on fertility by age 35 (SM Fig. 9) are shown in the Supplementary Material and support our main findings presented here.

As a second step, we examine whether environmental concerns were associated with the first-birth transition rate over the reproductive lifespan using piecewise-constant hazard models. Figure 3 shows hazard ratios of having major concerns about the environment (compared to no or some concerns). The first-birth transition rate was approximately 7% lower for people reporting major concerns than for those reporting no/some concerns. However, this finding is not statistically significant. Looking at gender differences in the first-birth transition rate, we find only a negligible effect of major environmental concerns for women, but a roughly 13% lower likelihood of entering fatherhood for men with major concerns compared to men

Table 2 Descriptive statistics environmental trajectories (#2)

Baseline			**Last observation**		
Variable	N	%	Variable	%	N
Gender			*Gender*		
Males	615	47.24	Males	615	47.24
Females	687	52.76	Females	687	52.76
Education			*Education*		
In School	441	33.87	In School	6	0.46
Inadequately	66	5.07	Inadequately	12	0.92
General Elemantary	616	47.31	General Elemantary	114	8.76
Middle Vocational	170	13.06	Middle Vocational	583	44.78
Vocational + Abi	6	0.46	Vocational + Abi	111	8.53
Higher Vocational	-	-	Higher Vocational	142	10.91
Higher Education	3	0.23	Higher Education	334	25.65
Residence			*Residence*		
Urban	882	67.74	Urban	906	69.59
Rural	420	32.26	Rural	396	30.41
Parenthood			*Parenthood*		
No	1,273	97.77	No	367	28.19
Yes	29	2.23	Yes	935	71.81
	Mean	**Std. Err.**		**Mean**	**Std. Err.**
Age in years	17.67	1.73	*Age in years*	43.05	5.39
n	1,302		**n**	1,302	

with some or no concerns. Estimates and confidence intervals for further covariates, as well as results stratified by gender, are shown in SM Table 5.

Furthermore, we examine whether the link between environmental concerns and childbearing varies across birth cohorts. As suggested in the background section, older birth cohorts (born before 1970) may have an active memory of certain environmental catastrophes and might have been active participants in important social movements (e.g., the student revolts of the 1970s resulting in the creation of the Green Party) during their formative years, whereas the younger cohorts (born after 1980) were still in their infancy during this period. Findings from piecewise-constant hazard models stratified by birth cohort groups are displayed in Fig. 4 below. Results suggest that individuals born before 1970 who reported major environmental

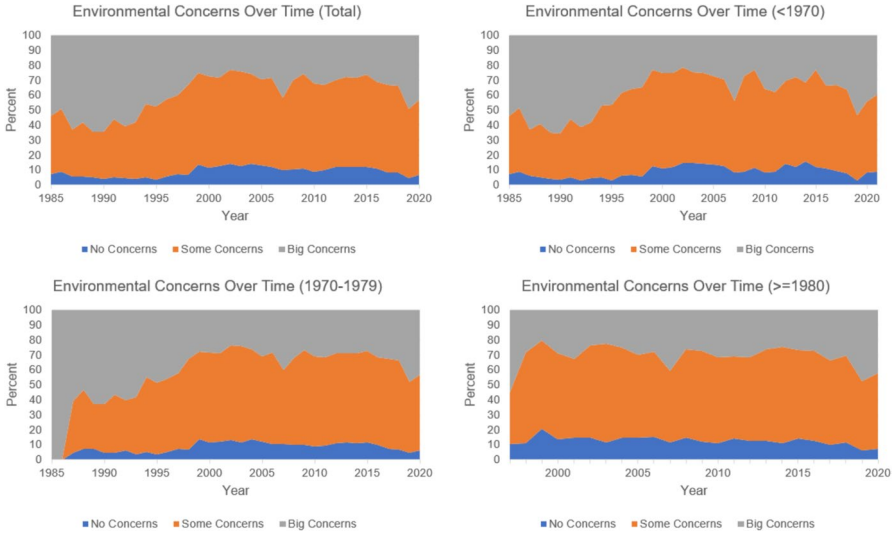

Fig. 1 Environmental concerns over time and birth cohorts. Note: Descriptive statistics showing percentages reporting no, some, and big environmental concerns; bivariate analyses without any control variables, SOEP data (1984–2020)

concerns had significantly lower first-birth hazard rates than their less concerned peers (hazard ratio: 0.77). We do not observe differences among the cohorts born after 1970. However, positive associations between environmental concerns and fertility are suggested for the youngest cohorts (>=1990), who experienced the contemporary climate change debates in their formative years. Confidence intervals are relatively large due to the small number of observations, but a reversal of the correlation between environmental concerns and fertility, in line with previous results by Golovina and Jokela (2024) on fertility-responses to general social concerns, may be indicated.

Environmental trajectories

We next examine whether parenthood is linked with environmental trajectories. Figure 5 shows the predictive margins of having major concerns over the life course derived from fixed-effects logit models according to parental status. Both parents and non-parents show decreasing probabilities of having major concerns with age starting from similar levels at age 20. For instance, a 20-year-old who had not entered parenthood (yet) was 34% more likely to have major concerns than some or no concerns. Among those who remained childless, this probability declined to approximately 9% at age 45. Among the respondents who entered parenthood, the probability of having major concerns at age 20 was slightly lower (32%) and reached 11% by age 45. Statistical uncertainty is, however, quite high. Point estimates and confidence intervals for the other covariates are listed in the first column of SM

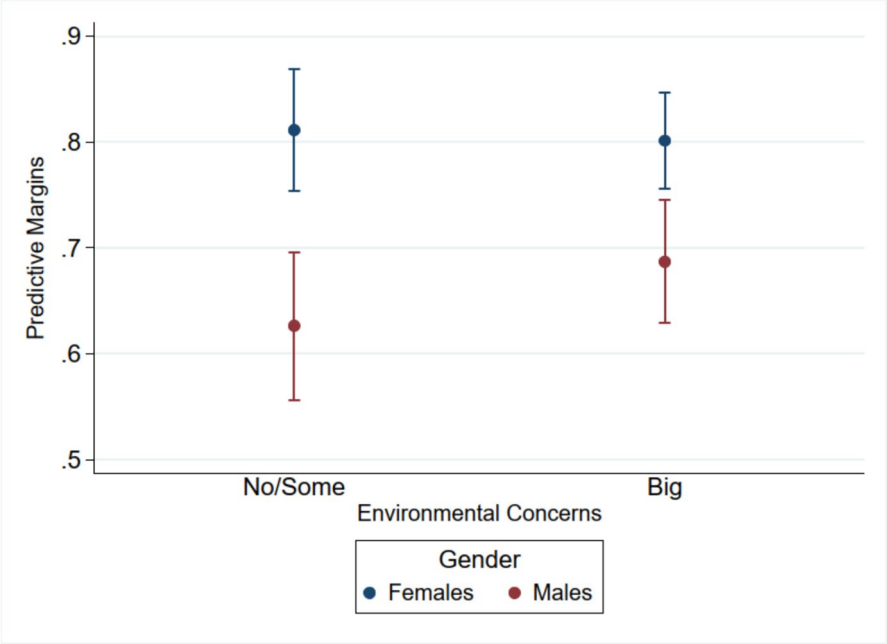

Fig. 2 Impact of environmental concerns on parenthood by age 40. Note: Logit models controlling for highest level of educational attainment, civil status, type of residence, and region; the dependent variable is the mode of environmental concern between ages 16 and 23

Table 6. Results from the random-effects model indicate similar patterns, although, as shown by SM Fig. 10, the steepness of the decline with age is lower compared to the FE model.

Additional analyses comparing individuals who were childless and those who had children by age 40 show similar patterns (see SM Fig. 11). As a further robustness check, we ran linear regression models on numeric environmental concerns (1 "no concerns," 2 "some concerns," 3 "big concerns"). These models support the findings from the logit models that the probability of reporting major environmental concerns decreased more among non-parents than among parents (see SM Fig. 12). Moreover, analyses stratified by age at first childbirth suggest that individuals who have become a parent before age 25 were more likely to report major environmental concerns at any age than childless individuals (SM Fig. 13). The differences between these groups are statistically significant according to contrasts of margins (SM Fig. 14). Corresponding estimates for other subgroups (parenthood between age 25 and 40, childless individuals) are shown in SM Fig. 15. Regression coefficients are listed in SM Table 7 of the Supplementary Material. Findings from random-effects models are displayed there in SM Fig. 16.

Figure 6 below shows the predictive margins on the probability of reporting major environmental concerns by parental status and gender. However, no clear differences between genders and parental statuses emerge (all estimates around 25%), and statistical uncertainties are large. Estimates for the other covariates from this model are

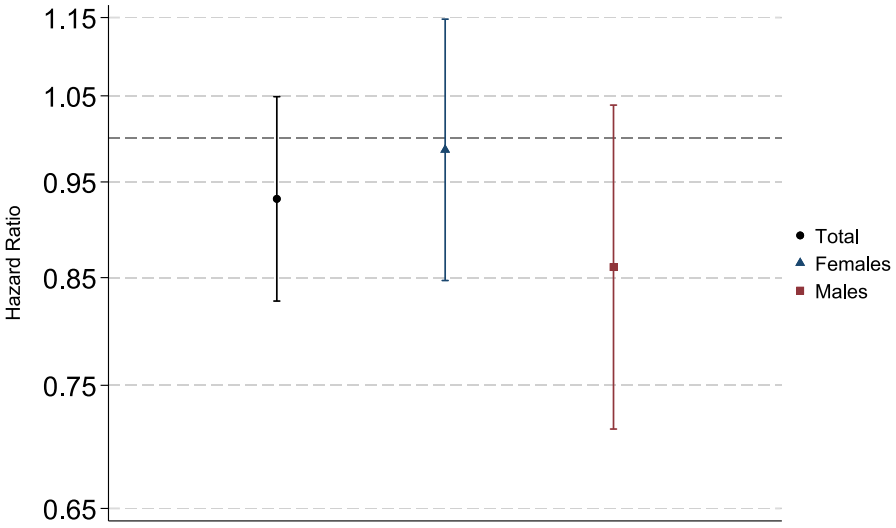

Fig. 3 Hazard ratios (major environmental concerns vs. no/some concerns) for first-birth transitions by gender. Note: Piecewise-constant hazard models controlling for highest level of educational attainment (lagged), birth year, civil status (lagged), income (lagged), type of residence, and region. In the "total" sample we also control for gender. Environmental concerns included as a lagged dummy variable

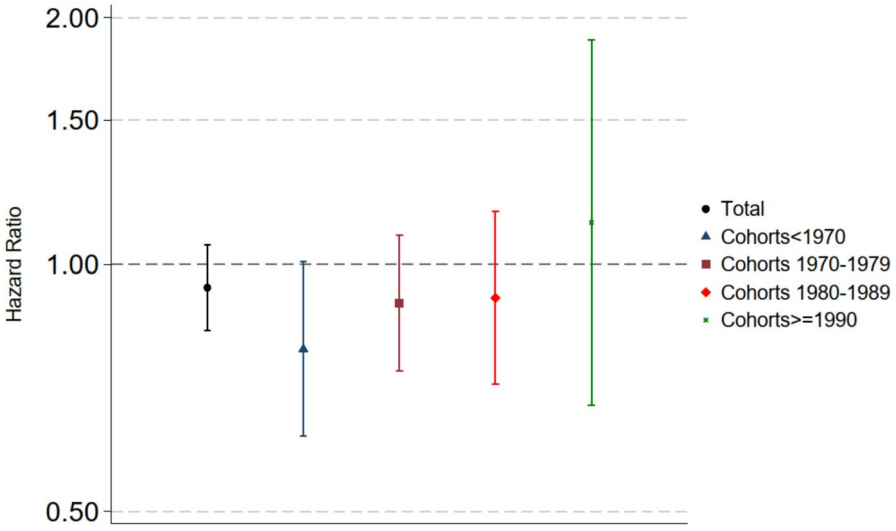

Fig. 4 Hazard ratios (major environmental concerns vs. no/some concerns) for first-birth transitions by birth cohort groups. Note: Piecewise-constant hazard models controlling for gender, highest level of educational attainment (lagged), civil status (lagged), income (lagged), type of residence (lagged), and region (lagged). Environmental concerns included as a lagged dummy variable

shown in the second column of SM Table 6. Findings from random-effects models are shown in SM Fig. 17. We do find gender differences among non-parents, but as fixed-effects models show no differences, they are likely rooted in unobserved differences between the groups.

Finally, the reciprocal relationship between environmental concerns and fertility may be shaped in part by education and, particularly in the German context, by the abovementioned regional differences. Education may be a cause and a proxy for political participation (Persson, 2013), which may affect knowledge about environmental developments. Education is negatively correlated with fertility in many European countries (Monstad et al., 2008; Sobotka et al., 2017). Moreover, it is positively linked with pro-environmental behaviors (Meyer, 2015) and with larger environmental concerns in Germany (Hartmann & Preisendörfer, 2021). While all of our models reported here control for these important mediating factors, we also conduct further supplementary analyses by education and region. Our findings (reported in Fig. 18–23 of the Supplementary Material) suggest no differences by education or region in the logit models on parenthood by age 40 and the environmental trajectories. However, results from event-history analyses show a negative association between environmental concerns and fertility risks over time for low educated people and East Germans.

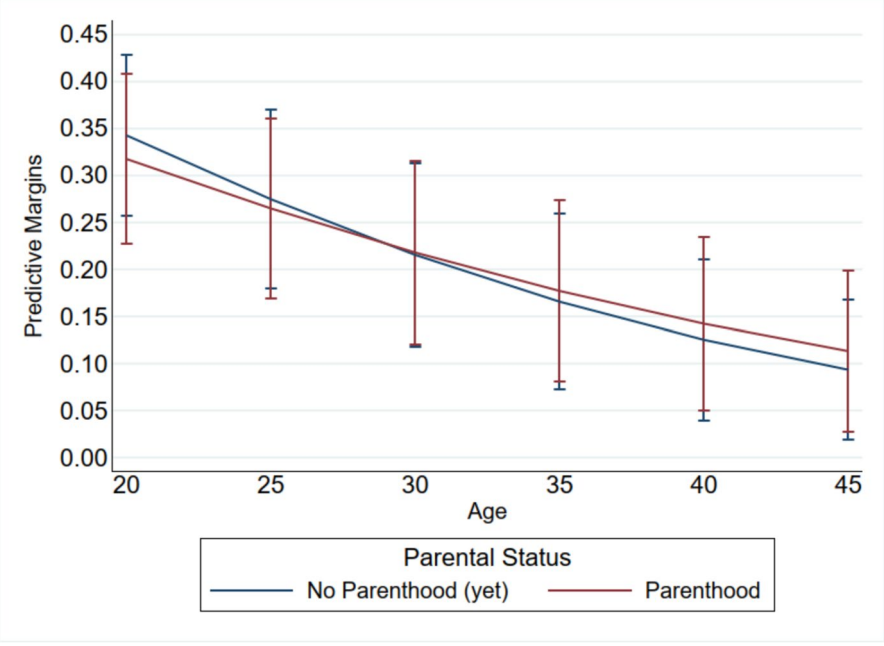

Fig. 5 Probability of major environmental concerns by parental status. Note: Fixed-effects logit models controlling for highest level of educational attainment, calendar year, type of residence, and region

Discussion

While much of the literature on the demographic implications of environmental forces is focused on fertility-related behaviors in the high-fertility contexts of the Global South (Grace, 2017; Sellers & Gray, 2019), our research adds to the growing body of literature on the fertility-environment link in the low-fertility context (e.g., Bielawska-Batorowicz et al., 2022; Bisi et al., 2024; De Rose & Testa, 2015; Szczuka, 2022). While the former mostly relies on "hard" measures, such as extreme temperatures (Barreca et al., 2018) or drought impacts (Berlemann & Wenzel, 2015) in societies that are already heavily affected by climate change, we investigate "soft" environmental attitudes and their association with fertility behavior in the German context. In contrast to most of the existing literature, though, we do not focus on a "soft" measure of fertility (e.g., intentions or desires) but actual fertility realizations. The aim is to provide a better understanding of fertility behavior and to explore the role of environmental concerns in family formation.

One of the greatest strengths of our study lies in its use of longitudinal data on environmental concerns, spanning complete fertility histories of decades of birth cohorts (mid-1960s to mid-1980s). Environmental concerns have been measured by GSOEP annually from 1984 onward, allowing us to follow individuals for 20 years or more starting from their early life stages. To the best of our knowledge, no other

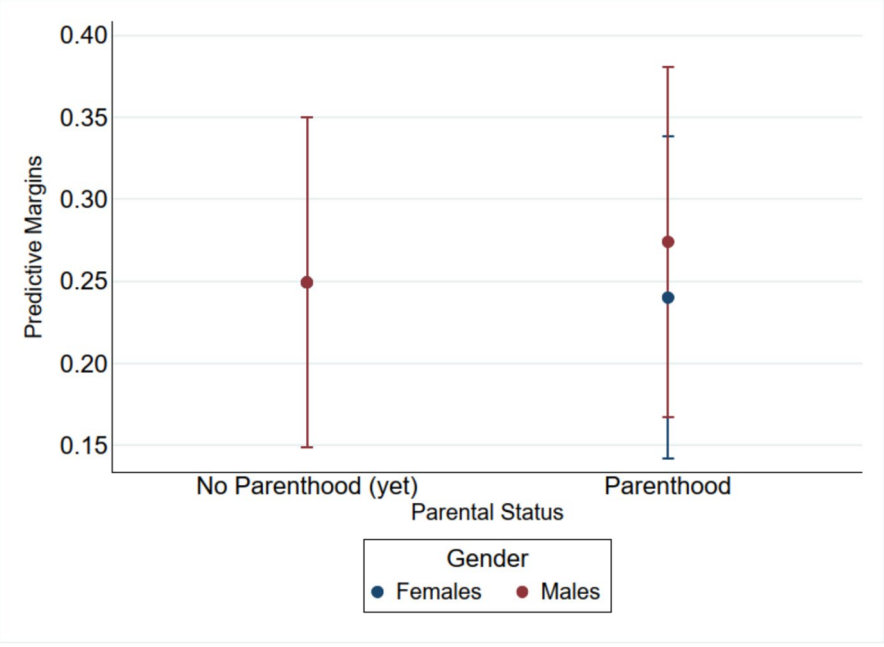

Fig. 6 Probability of major environmental concerns by parental status and gender. Note: Fixed-effects logit models controlling for age, level of educational attainment, calendar year, type of residence, and region

study to date has exploited such a wealth of longitudinal data focusing on either one of the directions in the environment-fertility relationship.

Nevertheless, our data source and resulting analyses have limitations. First, the environmental measure in GSOEP is very general. Rather than allowing people to specify the source of their concern (which could range from global warming to local environmental pollution, natural disasters, satisfaction with specific ecosystem services, or biodiversity loss), the survey item on "environmental concern" only allows respondents to choose one of three rather broad response options ("no," "some," "major concerns"). This structure leads to the vast majority of respondents reporting "major concerns," which forced us to dichotomize the variable, thus reducing its informational content. We could have used additional information on respondents' concerns regarding the impacts of climate change. As shown by Zoch and Kapelle (2025), this might well lead to different results in people's short- and medium-run fertility responses. However, as the corresponding survey item is included in GSOEP only since 2009, this alternative analysis would not allow us to answer the question on the long-run implications of concern or parenthood, respectively.

More importantly, "concern" may not be the most important psychological pathway through which environment-related factors translate into behavioral responses (Bamberg, 2003; Hirsh, 2010). Since our analysis relies on this single, broad measure of environmental attitudes, we must be cautious in drawing specific conclusions (e.g., with respect to climate change concerns). The lack of support for certain hypotheses may reflect the limitations of this general measure rather than indicate a lack of support for the hypotheses. Supplementary analyses based on the climate change survey item available from 2009 indicate that, in line with the literature (Franzen & Vogl, 2013; Peisker, 2023), general environmental concern and climate change concern are strongly positively correlated (see Fig. 24). We recommend that future research should examine the relationship between climate change concerns and childbearing once longer time series become available.

Another potential problem with the GSOEP survey item on environmental concerns arises from the volatility in people's response behavior. As Hartmann and Preisendörfer (2021) emphasized, concerns about the environment and climate change are heavily affected by period effects. In our first set of analyses, we tried to get this volatility under control by taking the mode over several survey waves rather than just a single response, thereby reducing potential distortions through anomalous years. In our longitudinal analyses, we try to mitigate this situation by controlling for period fixed effects, considering that environmental concerns might play more or less of a role in shaping fertility in different years. Using a more refined scale, such as the GSOEP item on satisfaction with the local environment (0–10), would certainly be preferable, as it could capture more variation in people's response behavior. However, this survey item is only available for a much more limited time period (1990–2003).

Additionally, there are important steps in the theorized pathways that we could not control for due to lack of measurement in the GSOEP data. For instance, fertility desires or intentions may be important mediators in the relationship between environmental concerns and fertility behavior (Rackin et al., 2022; Schneider-Mayerson & Leong, 2020). As pointed out by Golovina and Jokela (2024), concerns over the

environment might affect intentions and desires differently from actual realizations such that results would differ depending on the item used to study reproductive behavior. Similarly, on the environmental side of the relationship, we are lacking information on actual, environment-related behaviors. These might well differ from stated concerns. Also, people might be more or less likely to report environmental concerns depending on their knowledge and perceived efficacy with respect to environmental hazards (Milfont, 2012). While such factors could potentially influence fertility, the relevant information in our data was either missing or of insufficient quality and was therefore excluded from the analysis.

Besides some relevant mediators that we could not control for, we also lack information on some potentially important moderating factors, such as individual responsibility and trust in government: Using an experimental design, Bisi et al. (2024) find fertility desires to be strongly influenced by the pessimistic scenario of future climate change among university students from Belgium and Italy. This effect is found to be moderated, though, by the perceived personal responsibility and satisfaction with government actions. Similar results have been found regarding the relationship between fertility and general trust within societies, including in Germany (Aassve et al., 2016). Finally, an additional avenue for future research involves adopting a couple-oriented approach (Testa & Bolano, 2021; Testa et al., 2014) to examine how shared environmental attitudes within couples may influence reproductive decision-making. However, the GSOEP sample size is substantially reduced when focusing on couples rather than individuals, limiting our ability to pursue this type of analysis.

Conclusions

Although several theoretical approaches point to the importance of environmental attitudes for demographic outcomes, evidence on the hypothesized two-way relationship between environmental concerns and fertility remains scarce. Whether childless individuals are prevented from fulfilling their fertility desires (potentially due to higher concerns), or realizing fertility intentions causes environmental concerns, remains an open question. Moreover, it is unclear whether environmental concerns evolve differently for parents and childless individuals and, if there is indeed a difference, how soon after a child's birth those trajectories start to diverge.

The present study examined this two-way relationship using longitudinal data from Germany (GSOEP). We applied logit and piecewise-constant hazard models to estimate the quantum and timing of parenthood and fixed-effects logit models to estimate environmental trajectories over time. We found that levels of environmental concern early in life did not predict either the fertility quantum by age 40 or the timing of the transition to parenthood. While environmentally concerned men had a lower first-birth transition rate than environmentally concerned women, these differences were not statistically significant. However, our analyses reveal a negative association between environmental concerns and the transition to parenthood for individuals of older birth cohorts. We thus reject hypothesis #1a and #1c but find evidence for hypothesis #1b. These findings differ from previous studies reporting a

general link between environmental concern and fertility outcomes (Arnocky et al., 2012; Bastianelli 2025; De Rose & Testa, 2015) or a higher likelihood of entering parenthood among those with low environmental concern (Powdthavee et al., 2024). In our analysis based on German data, the environment-fertility link is negative and appears to apply only to older generations.

In a second set of analyses, we examined environmental concern trajectories over the life course. Our findings suggest that while childless individuals were slightly more likely to report major concerns at younger ages, their level of concern decreased more over the life course than it did among parents. At older ages, parents reported having greater environmental concerns than childless individuals. This might indicate that parenthood was weakening the age-related decrease in levels of environmental concern; however, the statistical uncertainty was large, and these differences were not statistically significant in the fixed-effects models. Thus, any differences in concern trajectories over the life course between parents and the childless were likely due to other unobserved stable factors that were correlated with environmental concerns and not causally related to parenthood.

Consequently, in line with previous research (Thomas et al., 2018; Zoch & Kapelle, 2025), we find no support for the legacy hypothesis, which claims that parents tended to be more concerned with the environment as their offspring will be forced to live in the environments that they inherit from them. We reject our hypotheses #2a and #2b, albeit with the caveat that those who had children very early in life might indeed be more environmentally concerned. Our findings are in line with previous evidence suggesting that parenthood does not change environmental concerns, neither for men nor for women (Milfont et al., 2020). While environmental concerns do not seem to have changed much around childbirth in Germany, climate change concerns may increasingly change over time after entering parenthood (Zoch & Kapelle, 2025). Therefore, more research is needed, in particular on climate change concerns as a presumably more powerful indicator, but also on the environmental concern trajectories of people who have children early in life.

Finally, while our study does not focus on policy implications, it is worth noting that since the 2000s, Germany has implemented progressive family policies aimed at facilitating greater work–family balance (e.g., expanded parental leave and childcare access; Bujard, 2011; Windwehr & Fischer, 2021). These reforms have been associated with increased fertility among higher-income women (Kreyenfeld, 2021). However, whether such policies have also influenced the link between environmental concerns and fertility remains an open question and lies beyond the scope of this analysis.

While our results are based on the broad notion of environmental concerns, they do have important implications for future research on potential developments in fertility behavior in the era of climate change. We found that environmental concerns at younger ages are not generally associated with the probability of having entered parenthood by mid-adulthood. Hence, it appears that in the past, environmental concerns did not play a large role in the formation of fertility preferences during early life stages, at least with regard to entering parenthood. Having said that, in this part of our analysis, we were able to examine only the cohorts born between the 1960s and the early 1980s. Birth cohorts whose fertility desires have developed in more recent years, when climate change has already become a more pressing issue,

presumably have bigger concerns about the future (Poortinga et al., 2023). If their concerns are indeed much larger, these worries may reflect more strongly in their fertility preferences. Our analyses on transition to first birth lend credibility to the idea that more recent cohorts might be different, as we find a positive association between environmental concerns and fertility among individuals born after 1990. This suggests that their concerns, expressed already very early in life, do not prevent them from transitioning to first birth early in the life course.

Consequently, it will be interesting to follow up on analyses indicating changes in the concern-fertility nexus over time and across birth cohorts. According to our results, members of the pre-1970 birth cohorts who had major environmental concerns transitioned to the first birth more slowly. This suggests that experiencing major environmental catastrophes in one's youth, like the Chernobyl disaster, might have knock-on effects on fertility later in life. But whereas these developments were relatively short-lived and transitory, climate change concerns among the contemporary youth may be a more lasting phenomenon, particularly if policies do not respond to these concerns in a timely manner. As a consequence, we might see even stronger associations between environmental concerns and childbearing among the more recent cohorts of prospective parents, with potentially less time left to postpone childbearing (Striessnig & Trimarchi, 2023). This could imply that childlessness levels will continue to increase in the future. More detailed data on both environmental concerns and fertility histories are needed to investigate this topic further.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11111-025-00501-x.

Acknowledgements We would like to thank our hosting and affiliated institutes, namely the Max Planck Institute for Demographic Research in Rostock, Stockholm University, University of Vienna, Wittgenstein Center for Demography and Global Human Capital (Vienna), University of Messina, Libera Università Internazionale degli Studi Sociali Guido Carli (Luiss, Rome), Goethe University Frankfurt, and Australian National University (Canberra) for providing resources in order to work on this study. Furthermore, we are very grateful for all helpful and valuable comments from colleagues from these institutions and conference participants, as well as the incredibly well-informed feedback of two anonymous reviewers.

Author contribution All authors contributed to the study conception and design. Material preparation and analysis were performed by Steffen Peters with the support of the other authors. The first draft of the manuscript was written by Steffen Peters. All authors commented on and contributed to previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Open access funding provided by University of Vienna. Steffen Peters received support through the resources provided by the International Max Planck Research School for Population, Health and Data Science (IMPRS-PHDS). Moreover, this paper was supported with funding from the Australian National University's Futures Scheme and funding from the German Research Foundation (DFG) under grant agreement 459056529 (Nitsche).

Data availability The data used in this research is available from the German Socio-Economic Panel (GSOEP). Access conditions for this data can be found at the official GSOEP website: https://www.diw.de/en/soep.

Declarations

Conflict of interest The authors declare no competing interests.

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