

How does parents' employment uncertainty affect infant health? Patterns and mechanisms in France.

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Introduction

The intergenerational transmission of inequality streams through several channels during a child's life. Research across social sciences and epidemiology shows how this process begins in the womb (Aizer and Currie, 2014; Almond et al., 2018; Härkönen et al., 2012; Panico & Tô, 2023; Torche, 2011). Socioeconomic background affects how parents react to the pregnancy, how the baby will develop in utero, and their health at birth and beyond (Currie, 2011; Gipson et al., 2008; Kramer et al., 2000). The extant literature has investigated the role of SES, including parental education, income, race, and employment status. Less is known about the effect of parents' precarious jobs, albeit they are an increasingly common experience in a worker's life (Kalleberg, 2018; Latner, 2022).

In this study, we set out to examine how precarious employment can affect birth outcomes. We adopt Pailhé and Solaz (2012)'s concept of "employment uncertainty", which encompasses both temporary work and unemployment. We consider that employment uncertainty can affect infant health primarily in two ways. Families may experience financial hardship because workers can contribute less to the household income (Latner and Saks, 2022). Moreover, a turbulent job trajectory can cause psychological distress for the worker, which may subsequently spill over onto their partner (Inanc, 2018). This, in turn, can result in health behaviors, for instance, smoking, that may harm fetal growth (Everding and Marcus, 2020). Children born to parents who experience material deprivation and stress tend to be in poorer health at birth, which has short and long-term consequences on their educational attainment, job prospects, and life-long health (Almond et al., 2018; Torche, 2018).

We aim to contribute to the literature in the following ways. First, we provide novel evidence concerning the link between parents' employment uncertainty and infant health. Second, we focus on the role of gender in family dynamics by analyzing the effect of different combinations of employment uncertainty within the household. Third, we examine the cumulative disadvantage that arises when both partners experience employment uncertainty. Fourth, we explore the role of income and smoking in mediating the effect of household employment uncertainty (HEU).

We include household income as a potential mediator because income tends to be lower when parents face employment uncertainty. In fact, i) unemployed benefits cover only a fraction of the previous wage and ii) temporary employees receive on average lower wages than their permanent counterparts (Berson, 2018; Latner and Saks, 2022). Moreover, income is linked to birthweight, also in France, where the prevalence of low birthweight aligns with the OECD average (Panico et al., 2015).

Turning to smoking, this behavior is relatively common in France, where approximately two out of ten mothers smoked at least once during their pregnancies. Indeed, smoking is the main mediator of the effect of maternal education on birthweight in France (Panico and Tô, 2023). Employment uncertainty has been linked to worse mental health in women when they are experiencing it or when their partner has a temporary job (Inanc, 2018). In turn, emotional distress may influence smoking. We know that unemployment has been linked to increased smoking behavior of couples (Everding and Marcus, 2020). In France, maternal unemployment has been linked to persistent heavy smoking, while paternal unemployment's coefficient was smaller and not statistically significant (El-Khoury et al., 2017).

Data and Variables

We use the French National Cohort of Children (ELFE), a representative study that follows 18,000 children born in 2011 (Charles et al., 2020). In this study, we draw on the first two waves, administered respectively at the child's birth, and when the child was two months old. We use two analytical samples obtained via listwise deletion: the "employees" sample includes only households where both parents are employees (N = 8,592) and the "all parents" sample (N = 13,100).

The dependent variables include two key indicators of infant health: a continuous measure of birthweight and a binary indicator for "small for gestational age" (SGA), which equals one if the birthweight of the child is below the tenth percentile at a given gestational week (Mikolajczyk et al., 2011). We decided not to use low birthweight (LBW) as an indicator of infant health because the ELFE data do not include very pre-term children, i.e., children born before the thirty-fourth week of gestation. All variables are reported by the mother during the face-to-face survey administered at the birth of the child.

The independent variable is household employment uncertainty (HEU). We employ two specifications. First, we use the variable "household employment uncertainty - employees" within the subset of households where both parents are employees. This variable comprises the following four categories: i) both parents have a permanent contract (reference category), ii) only the mother has a temporary contract, iii) only the father has a temporary contract, and iv) both parents have a temporary contract.

Next, we use the variable "household employment uncertainty - all parents" for the entire analytical sample. In this case, when a parent does not have a permanent contract, they may have a temporary contract, be unemployed, or inactive. This variable comprises the following four categories: i) both parents have a permanent contract (reference category), ii) the mother does not have a permanent contract, iii) the father does not have a permanent contract, and iv) neither parent has a permanent contract.

In the preliminary mediation analysis, we collapsed the variable "household employment uncertainty - all parents" into a binary variable that distinguishes between i) households where neither parent has a permanent contract, and ii) households where at least one parent holds a permanent contract (the reference category).

We employ two mediators in our analysis. First, we use the logarithm of the equivalized household income, to account for household size and composition. Second, we use a binary variable that takes on a value of one when the mother reported smoking during the pregnancy.

We take into account the following control variables: the age of each parent, their migratory background, the level of education and social class of the household, the birth order and sex of the child, whether the child is a twin, and the season of birth.

Analytical Strategy

We use linear regression and linear probability model, both with survey weights and hospital fixed effects, to assess the patterns of association between parents' employment uncertainty and their child's birth outcomes.

To explore the mechanisms, we set up a formal mediation analysis within the potential outcome framework and allow for the interaction of HEU and the mediator of interest (VanderWeele, 2015). We use again survey weights and hospital fixed effects. Moreover, we explore whether household income is a post-treatment confounder of the mediator-outcome link for the mediator variable "smoking", using a

regression-with-residual approach (Wodtke and Zhou, 2020). We use the command “rwrmed” developed to use this technique in Stata (Linden et al., 2021). In this way, we estimate the randomized intervention analogue of the natural direct and indirect effects.

Preliminary Results: Patterns Analysis

The results show that babies are approximately 30% more likely to be born small for gestational age (SGA) when the father faces employment uncertainty, while lower birthweights (up to 80 grams, for the “employees” sample) are observed when neither parent holds a permanent job. We hypothesize that SGA may reflect continuous stress, while average birthweight may reflect a more acute stress that anticipates labor. When only the mother has a permanent job, she may experience heightened anxiety in response to the father's uncertain position and to the lower household income. Nevertheless, her permanent position may serve as a constant buffer against extreme stress. On the other hand, when both parents experience employment uncertainty, acute stress could be triggered. Both for SGA and birthweight, the effect size is in the range of relevant socio-economic indicators and is substantial. To my knowledge, this is the first estimation of the association between temporary employment and infant health.

Preliminary Mediation Analysis

We report in this abstract the first preliminary results of the mediation analysis, which focus on the outcome “birthweight” and the “all parents” sample. Both income and smoking appear to mediate approximately 25% of the total effect of HEU on birthweight (ca - 40 grams). Moreover, the mediation of smoking is robust to controlling for income as the post-treatment confounder of the mediator-outcome link, using the regression-with-residuals method (Wodtke & Zhou, 2020).

Conclusions and Next Steps

Overall, this study emphasizes the importance of taking into account employment uncertainty, gender dynamics within the household, and the accumulation of disadvantage, when examining the effects of parental employment on infant health. Our results suggest that focusing on the instability of work trajectories could provide relevant insights into the intergenerational transmission of social inequality. Both income and smoking appear to mediate the effect of HEU on infant health.

Our results are still preliminary. The next steps include completing the mediation analysis, and exploring multiple mediation with path-specific effects.

First, we aim to extend the mediation analysis to the “employees” sample and to the outcome “SGA”.

Second, we plan to repeat the mediation analysis using the four-category independent variable for HEU, in the “employees” and “all parents” samples.

Third, we aim to integrate the counterfactual mediation approach with machine learning to decompose the total effect of HEU into a set of path-specific effects (PSEs), examining multiple mediators that are potentially causally dependent (Brand et al., 2023; Zhou and Yamamoto, 2023). For example, we aim to test whether income is causally antecedent to stress, and if the latter is, in turn, causally antecedent to smoking.

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