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Research Article

Special times? How COVID-specific concerns disrupted fertility desires in the United States during the COVID-19 pandemic

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Contents

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Special times? How COVID-specific concerns disrupted fertility desires in the United States during the COVID-19 pandemic

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Abstract

BACKGROUND
Despite growing research on fertility during COVID-19, the precise mechanisms underlying fertility responses to the pandemic remain poorly understood.

OBJECTIVE
We specifically focus on COVID-19 mitigation policies and the health implications of COVID-19. We examine whether disruptions in fertility desires during COVID-19 can be attributed to material and emotional hardships – comparable to those observed in other crises – or if they are uniquely linked to broader concerns specific to the pandemic itself.

METHODS
We used original data from a nationally representative longitudinal survey on well-being during COVID-19 in the United States (N = 2,433). We first conducted exploratory factor analysis to examine the underlying relationships between various views related to the COVID-19 pandemic. Then we employed multinomial logistic regression and linear regression models to examine how COVID-specific concerns and hardships were associated with fertility desires in late 2020 and late 2021.

RESULTS
Material and emotional hardships were associated with less stable fertility desires in late 2020 and late 2021. However, generalized concerns related to the pandemic, including restrictions of daily activities due to social distancing and worries about contracting and spreading the virus, were associated with a decrease in fertility desires in late 2020, even after accounting for hardships. Suggestive evidence shows that these COVID-specific concerns remained negatively associated with fertility desires in late 2021.

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CONCLUSIONS
Beyond material and emotional hardships brought by COVID-19, concerns surrounding the pandemic itself may have had a distinct impact on fertility desires.

CONTRIBUTION
This study contributes to the mechanisms underlying fertility responses to the COVID-19 pandemic.

1. Introduction

It has been well documented that economic concerns associated with large-scale crises can disrupt fertility (Adsera and Menendez 2011; Comolli 2017; Eloundou-Enyegue, Stokes, and Cornwell 2000). While the COVID-19 pandemic certainly caused economic uncertainty and emotional difficulties as with other large-scale crises, it was also unique in its scale and in its mitigation. As a worldwide economic and health crisis, it brought profound material and emotional hardships to individuals while additionally requiring people to socially distance from one another. Perhaps equally important, it may have fundamentally changed how people think about their lives, at least in the short term. Specifically, adults of childbearing age may have been prompted to rethink their fertility decisions given their concerns surrounding the effects of COVID-19 beyond their individual material and emotional well-being. While prior research suggests that COVID-19 was associated with falling birth rates in the United States (Cohen 2021; Wilde et al. 2024), we actually know very little about the exact factors that may have disrupted fertility desires during the COVID-19 pandemic (Nitsche and Wilde 2024).

Prior studies on fertility responses to crises have primarily focused on how material hardships experienced during crises impact fertility preferences. During COVID-19, women with lower socioeconomic status, without health insurance, and with restricted access to contraception were more likely to change their fertility preferences than were more advantaged groups (Lin et al. 2021; Lindberg et al. 2020; Naya, Saxbe, and Dunton 2021; Rocca et al. 2022). This strand of research suggests that individuals with more material resources may have experienced fewer economic uncertainties and were therefore able to maintain their pre-pandemic fertility preferences. Yet culturally centered theories suggest that crises not only bring shocks to individuals' material well-being but may also affect their attitudes and beliefs about their lives, which in turn may change their fertility desires (Manning et al. 2022; Rodgers, John, and Coleman 2005). However, studies that examine the mechanisms underlying fertility responses to COVID-19 remain scarce. Fertility levels had already been declining in the United States prior to the

pandemic (Guzzo and Hayford 2020). It is thus critical for us to understand factors that may contribute to further declines during and following the COVID-19 pandemic.

In this study, we draw on two waves of a nationally representative longitudinal survey on well-being during COVID-19 in the United States to examine two research questions: (1) Can disruptions in fertility desires during the pandemic be explained by material and emotional hardships brought by the pandemic or by concerns surrounding the COVID-19 pandemic itself? (2) How persistently do COVID-specific concerns affect fertility desires? We argue that, above and beyond the material and emotional hardships brought by COVID-19, generalized concerns surrounding the pandemic itself may have had a distinct impact on people's fertility desires. This influence may be attributed to the interplay of various interconnected impacts related to the COVID-19 pandemic. Firstly, the unprecedented implementation of social distancing protocols, mandating individuals to restrict their daily activities, produced profound uncertainties in people's social interactions and had the potential to reshape their perspectives on childbearing. For instance, during the initial stages of the pandemic, universal hospital restrictions on family visitations may have prompted individuals who value familial presence during childbirth to delay their childbearing plans (Wright 2022). Furthermore, concerns about social distancing were deeply intertwined with health-related worries. Those who feared contracting COVID-19 or spreading the virus to their newborn children were also likely to restrict their daily activities based on social distancing guidelines. Both health concerns and the restriction of daily activities may have prompted individuals to change their childbearing plans. In addition, the limited availability of health care providers during lockdowns may have heightened uncertainty about the virus's health implications for pregnant women and their unborn children, particularly when in-person treatment options were scarce (Peivandi et al. 2022). Taken together, these pandemic-specific concerns may have independently influenced individuals' fertility desires during this period of heightened uncertainty, above and beyond the effects of material and emotional hardships.

2. Fertility responses to crises

2.1 Economic and material hardships

It has been widely documented that natural and human-made disasters affect fertility. Catastrophic events can impact human fertility through various mechanisms. One mechanism involves the economic effects of disasters, suggesting that such events usually introduce economic uncertainties and practical hardships related to pregnancy. Economic theories compare children to durable goods, suggesting that couples' demands

for children tend to decrease in response to a decline in income (Becker 1960). Economic recessions, characterized by high unemployment, usually disrupt individuals' expectations regarding future incomes and lead couples to postpone childbearing. Research shows that rising unemployment following economic recessions has been associated with a significant decrease in total fertility rates in Europe, the United States, and Latin America (Adsera and Menendez 2011; Comolli 2017; Matysiak, Sobotka, and Vignoli 2021). On the other hand, when unemployment rates increase, the opportunity cost of having children may decrease for women due to lower income and a higher chance of being unemployed (Butz and Ward 1979). Therefore, periods of high economic uncertainty could be associated with increased fertility desires among women (Sobotka, Skirbekk, and Philipov 2011). Besides unemployment, disasters introduce other practical hardships related to pregnancy. Disasters can disrupt access to contraceptives and reproductive health services in various ways, including the closure of health care providers, safety concerns surrounding travel to health centers, inability to afford contraception, and supply shortages (Freed et al. 2021). Behrman and Weitzman (2016) found that disrupted access to injectable contraceptives during the 2010 Haiti earthquake was associated with increased unintended pregnancy.

Another perspective in the literature argues that people's *perception* of the economic uncertainty introduced by crises, rather than objective economic uncertainty itself, affects fertility behavior. Instead of focusing on objective indicators such as unemployment, inflation, and consumer confidence, this perspective focuses on how individuals perceive economic uncertainties. Perceived uncertainty about the future makes it difficult for couples to predict the cost of childbearing and thus may reduce confidence that they can guarantee the welfare of future children. Ranjan (1999) focuses on former Soviet bloc countries undergoing transition from a controlled economy to a market-based economy, showing that uncertainties about future income can lead people to postpone their childbearing plans. Similarly, Hofmann and Hohmeyer (2013), using data from the German Socio-Economic Panel, provided empirical evidence that women responded to economic concerns by reducing fertility in the next year. Gatta et al. (2022) further showed that the perception of resilience to job loss predicts fertility intentions among couples in Italy experiencing large-scale labor market deregulation.

2.2 Culturally centered theories

Culturally centered arguments suggest that structural constraints alone cannot predict reproductive behavior or intentions (Vignoli et al. 2020). Instead, individuals' schemas, such as their ideas, values, beliefs, and patterns of thinking, shape people's intentions and actions (Johnson-Hanks et al. 2011; Manning et al. 2022). During disasters,

psychological hardships lead to shifts in individuals' attitudes and behavior related to childbearing. Attachment theory argues that, in response to elevated stress and threat, individuals seek physical proximity and support from loved ones (Bowlby 1969; Hazan and Shaver 1994). This proximity-seeking behavior among couples may lead to a higher frequency of sexual activity, consequently contributing to an increase in birth rates. Cohan and Cole (2002) provided empirical support for attachment theory. They found that in the aftermath of Hurricane Hugo in 1989, there was an observed increase in marriage and birth rates in the South Carolina counties declared disaster areas.

Replacement theory suggests that when parents observe the loss of children in the aftermath of disasters, they increase fertility desires to replace the lost lives (Davis 2017; Rodgers, John, and Coleman 2005). Several studies found support for the replacement theory, including a large increase in fertility following the 2004 Indian Ocean tsunami (Nobles, Frankenberg, and Thomas 2015), the Oklahoma City bombing (Rodgers, John, and Coleman 2005), and high-mortality earthquakes in India, Pakistan, and Turkey (Finlay 2009).

Nevertheless, the impact of disasters extends beyond individuals' direct experience of stress. Importantly, social support (both perceived and received) in the aftermath of stressful life events can serve as a protective factor against the stress induced by disasters (Norris and Kaniasty 1996). Social support helps pregnant women cope with stress associated with the loss of resources by fostering feelings of well-being and enhancing their sense of personal control (Costa et al. 2019). Therefore, emotional support received from social networks may potentially help individuals maintain their fertility plans during times of uncertainty, but evidence regarding this relationship has been lacking.

3. How special is COVID-19?

As a worldwide economic and health crisis, the COVID-19 pandemic brought profound material and emotional challenges due to unemployment, social distancing, and worsening health conditions, mirroring the struggles seen in other catastrophic events. However, COVID-19 is unique in various ways. As an infectious disease, COVID-19 spread rapidly across the globe, affecting a substantial portion of the global population. Unlike disasters that had only short-term impacts, COVID-19 endured for more than three years and unfolded in multiple waves, introducing profound uncertainties regarding its long-term health implications. Due to its highly contagious nature, COVID-19 prompted countries worldwide to implement unprecedented mitigation policies, reshaping the fabric of daily life. Universal application of social distancing guidelines became a key strategy following the COVID-19 outbreak, requiring individuals to stay at home, work remotely, and restrict their daily behavior to minimize the risk of virus transmission. Thus

COVID-19 may have necessitated significant changes in individuals' attitudes and behavior, at least in the short term.

The pandemic was accompanied by a drop in fertility in the United States (Aassve et al. 2021; Cohen 2021; Sobotka et al. 2021). Yet the pandemic-related disruptions were not equally experienced by different demographic groups. During COVID-19, racial and ethnic minorities, individuals with lower household incomes, and those with limited access to contraception were more likely than more advantaged groups to change their fertility desires (Lindberg et al. 2020; Naya, Saxbe, and Dunton 2021; Rocca et al. 2022). Recent nationally representative findings suggest that such disparities persisted through late 2021 (Yang and Kao 2024). These studies indicate that individuals with more resources were better protected from the economic challenges brought by the pandemic and, as a result, were better positioned to maintain stable fertility desires.

Despite growing research on fertility responses to COVID-19, mechanisms underlying these fertility responses remain poorly understood, and evidence is mixed. Malicka, Mynarska, and Świderska (2021) found that in Poland, financial insecurity and decreased mental well-being during COVID-19 were associated with the postponement of childbearing. By contrast, Manning et al. (2022) suggest that pandemic-related subjective assessments, rather than economic indicators, were related to levels of fertility motivations during the pandemic. However, most of the respondents in their sample grew up in northwestern Ohio, and their data were collected before major spikes in pandemic-related deaths. Studies that examine COVID-related challenges have mostly focused on financial insecurity and the loss of income (Lindberg et al. 2020; Luppi, Arpino, and Rosina 2020; Malicka, Mynarska, and Świderska 2021) while leaving other challenges arising from COVID-19, including the lack of social support, physical contact, and romantic connections, largely unexplored. Further analysis of nationally representative data that incorporate more comprehensive measures of COVID-related challenges is urgently needed to reveal the mechanisms underlying pandemic-related fertility responses.

In this paper, we consider more comprehensive measures of the material and emotional hardships experienced during the COVID-19 pandemic, contending that above and beyond these difficulties, generalized concerns surrounding the pandemic itself may have shifted peoples' attitudes and behavior, resulting in changes in fertility desires. Specifically, we propose that various aspects of concerns regarding the pandemic are intertwined and should not be viewed in isolation. The highly contagious COVID-19 virus endured for more than three years, creating profound uncertainties surrounding its long-term health implications. Particularly in the early stages of the pandemic, prospective parents were often uncertain about the potential negative effects of infection on themselves and their newborns. Concerns surrounding transmitting COVID-19 to newborns could have contributed to individuals decreasing their fertility desires, at least

in the short term. Furthermore, the unprecedented implementation of COVID mitigation policies such as social distancing likely reinforced concerns regarding the health impacts of COVID-19. For instance, the lack of access to health care providers due to social distancing guidelines may have exacerbated individuals' worries about contracting COVID-19 during pregnancy, especially when in-person treatment options were constrained. In addition, hospitals in the United States uniformly enforced restrictions on family visitations during the early stages of the COVID-19 pandemic (Hyczko et al. 2022). Individuals who valued having family and friends present at the arrival of a new child but were concerned about exposing themselves and their loved ones to the virus might have chosen to delay their childbearing plans so that their family members and friends could visit without the constraints caused by COVID-19. These multifaceted and interconnected concerns surrounding the pandemic – including worries about contracting and spreading the virus, and uncertainties regarding social interactions due to COVID-19 mitigation policies – may have collectively contributed to individuals decreasing their fertility desires, at least in the short term.

4. Data and methods

We draw on original data from two waves of the Longitudinal Study of Dynamics of Social Life during COVID-19 (DSL-COVID), a nationally representative survey on well-being and social life in the United States during the COVID-19 pandemic conducted by Yale University researchers (Tessler, Choi, and Kao 2025). The survey was administered through YouGov, a well-established research and analytics firm specializing in online research and opinion polling. YouGov employed a two-stage sampling design to create a nationally representative sample, first matching responses to a sampling frame using the 2017 American Community Survey (ACS) one-year sample for gender, age, race/ethnicity, and education, and then applying sampling weights to ensure national representativeness (Tessler, Choi, and Kao 2025). The initial survey wave was administered in November 2020, followed by the second wave conducted from October to December 2021. The first wave comprised 3,116 individuals, and the second wave had a sample of 1,892 individuals.

YouGov recruited respondents among a random subsample of online panel members representative of adults in the United States in terms of gender, age, race/ethnicity, and education. The response rates of YouGov-administered surveys typically reach at least 40% within 24 hours and 60% within 72 hours (Kellner 2004). A study by the Pew Research Center suggests that YouGov consistently outperforms other online survey platforms in accuracy and also generates more reliable results than the Pew Research Center's probability-based American Trends Panel, largely due to YouGov's elaborate

set of adjustments at both the sample selection and weighting stages (Kennedy et al. 2016; Rivers 2016). Furthermore, unlike surveys that employ passive sampling (allowing anyone to take part), YouGov utilizes active sampling, which restricts survey participation to only randomly selected respondents in the sampling stage (Twyman 2008). YouGov's use of a secure, password-protected system may help deter bot interference by ensuring strict control over survey participation (Twyman 2008).

To examine changes in fertility desires during the COVID-19 pandemic, we excluded respondents who reported having a baby during the pandemic (N = 137). This exclusion was based on the rationale that individuals who had a baby during the study period might have reported fertility desires that had already been realized rather than current or prospective preferences. Moreover, recent childbirth might have uniquely influenced individuals' fertility desires, leading to systematic differences compared to those who did not experience such events. This exclusion criterion is consistent with prior research on fertility preferences during the pandemic (Naya, Saxbe, and Dunton 2021; Rocca et al. 2022). Additionally, six respondents were excluded due to missing data on the number of children below 18 (N = 3), hardship experienced due to loss of income (N = 1), fertility desires in wave 1 (N = 1), and perspectives on the extent to which they restricted their daily behaviors due to social distancing guidelines (N = 1). A binary variable was employed to identify respondents with missing income information (N = 300). We further excluded individuals aged above 50 for the purpose of this study (N = 1,380). Our final analytic sample included men and women aged 18–49 who participated in wave 1 (732 men and 861 women) and wave 2 (382 men and 458 women) (N = 2,433).

Because around 47% of respondents dropped out in wave 2, we created attrition weights that adjust for those who were not successfully surveyed in wave 2.[3] We further compared key sample characteristics of the original wave 1 sample (N = 1,593), the subsample that dropped out from the survey in wave 2 (N = 753), the subsample that was successfully followed up in wave 2 (N = 840), and the followed-up sample adjusted by attrition weights (N = 840). Table A-2 shows that after we adjusted the followed-up sample with attrition weights, the remaining sample's characteristics (column 4) closely resembled those of the original wave 1 sample (column 1), indicating that the weighting procedure effectively mitigated biases introduced by attrition. We used the product of the sampling weight and attrition weight as regression weights in our analyses for wave 2.

[3] To construct attrition weights, we first estimated a logistic regression model predicting the probability of dropping out based on demographic characteristics (see Table A-1). Next we generated a propensity score (the predicted probability of dropping out) for each respondent. Attrition weights are the inverse of propensity scores (1/ps) for those who dropped out and the inverse of 1 minus the propensity score (1/(1-ps)) for those who did not drop out.

4.1 Dependent variables

This study considers two main dependent variables. The first dependent variable is the change in fertility desires between the beginning of the pandemic (March 2020) and wave 1 (November 2020). In wave 1, this variable was measured by the question "How has your desire to have a baby changed since March 2020?" This variable was recoded as a categorical variable with the following three categories: increased desire, unchanged desire, and decreased desire.

The second dependent variable measured the level of fertility desire both in wave 1 and in wave 2. The question "How interested are you in having a baby?" was asked in both waves. These measures used a Likert scale that ranged from 1 (not interested at all) to 5 (extremely interested). The levels of fertility desires in wave 1 and wave 2 were coded as continuous variables.

Differing from other studies that measure fertility desires with ideal family sizes or the desire to avoid pregnancy (Hagewen and Morgan 2005; Mcallister et al. 2012; Weitzman et al. 2017), we examine the short-term change in the strength of fertility desires during COVID-19. Evidence shows that the pandemic had no impact on ideal family sizes in the United States, underscoring the stability of long-term family size preferences (Behrman 2023). In complementing this body of literature, our study focuses on a measure that reflects short-term change in the strength of fertility desires, recognizing that these are likely to be directly influenced by the pandemic compared to the more enduring stability of ideal family sizes (Manning et al. 2022).

4.2 COVID-specific concerns

For the main independent variable, we rely on a unique set of questions about respondents' views on statements related to the COVID-19 pandemic. Similar sets of questions were commonly used in survey studies conducted during the pandemic to examine individuals' attitudes toward the pandemic and their associations with fertility desires (Banaei et al. 2023; Ben-Kimhy et al. 2020; Manning et al. 2022). The following four questionnaire items pertaining to views on the COVID-19 pandemic were applied:

- "I restrict my daily behaviors based on social distancing guidelines."
- "COVID-19 is a major threat to the health of the US population."
- "I am worried about getting sick with COVID-19."
- "I am worried about spreading COVID-19 to other people."

For each statement, respondents were asked to rate their agreement or disagreement. The answers were recorded on a seven-point Likert scale, where 1 stands for complete disagreement and 7 stands for complete agreement.

These items represent different yet closely interconnected aspects of concerns about the COVID-19 pandemic. The first item addresses whether respondents altered their daily activities to adhere to social distancing guidelines, which may reflect an actual or expected decrease in visits to health care providers and in-person gatherings with family members and friends. The second item focuses on respondents' perception of the pandemic as a public health crisis that may affect overall societal conditions. The third item gauges respondents' personal concerns regarding the potential impact of the virus on their own health. The fourth statement evaluates respondents' concerns about transmitting COVID-19 to other people, which may include friends, family members, and an unborn or newborn child.

Conceptually, these four variables are deeply intertwined and cannot be viewed in isolation. For example, individuals worried about getting sick with COVID-19 or spreading the virus to other people were likely to restrict their daily activities based on social distancing guidelines. On the other hand, the restriction of daily activities during lockdowns resulted in substantial disruptions to reproductive health services and routine visits to health care providers (Lindberg et al. 2020). The lack of access to health care services may have reinforced individuals' worries about contracting COVID-19 during pregnancy, as limited access to health care providers increases uncertainty about managing the virus's potential health effects on both pregnant mothers and their unborn children (Peivandi et al. 2022). Furthermore, individuals' perception of the pandemic as a macro-level health crisis is closely correlated with internalized personal concerns about contracting the virus or spreading the virus to other people. Together, these four interrelated variables capture individuals' generalized concerns regarding the multifaceted impacts of the COVID-19 pandemic.

Statistically, Cronbach's alpha test (Cronbach's alpha = 0.895) reveals a high level of internal consistency among these four variables. We further used exploratory factor analysis to identify meaningful underlying commonalities in the four variables. Factor analysis reduces a group of correlated variables to a smaller number of latent, unobserved variables, which are also called factors (Tencza, Stokes, and Preston 2014). Each identified factor has a factor loading for every observed variable, indicating the correlation between the factor and each variable. First, the Bartlett test of sphericity suggests that the four variables are sufficiently correlated to proceed with factor analysis ($p < 0.001$). Next, exploratory factor analysis indicates that the four variables load onto a single factor with an eigenvalue greater than 1. Table 1 presents the factor loadings, suggesting that the four variables load more or less equally on the factor, each with substantial loadings around 0.8. These high factor loadings indicate strong correlations

between each variable and the underlying factor. Based on the statistical and conceptual relationships between these four variables (reviewed above), we labeled this factor "COVID-specific concerns," as we believe this factor captures respondents' generalized concerns regarding the multifaceted and interrelated impacts of the COVID-19 pandemic.

Table 1: Sample factor loadings

COVID-specific concerns	
Variables on COVID-related statements	Factor loading
"I restrict my daily behavior based on social distancing guidelines."	0.790
"COVID-19 is a major threat to the health of the US population."	0.825
"I am worried about getting sick with COVID-19."	0.880
"I am worried about spreading COVID-19 to other people."	0.812

Notes: Factor analysis generates one factor. Factor loadings represent the correlations between the factor and each of the four original variables on COVID-19-related statements.

We constructed an index that reflects generalized COVID-specific concerns by taking the average of the four questionnaire items. In doing so, we aimed to synthesize the above intertwined dimensions of COVID-related concerns rather than separating them from each other. The value of the index ranges from 1 to 7, with higher values indicating greater levels of COVID-specific concerns. We acknowledge that the second statement, which addresses respondents' perception of the pandemic as a health threat to the general US population, may reflect a slightly different aspect of COVID-specific concerns compared to the other three statements, which correspond to personal concerns (getting sick with COVID-19, restricting one's daily activities, and spreading the virus to other people) regarding the pandemic. However, we believe concerns regarding the broader health impacts of the pandemic are closely intertwined with these personal concerns, as the perception of COVID-19 as a threat to the health of the US population heightens individual fear and influences personal behavior. Prior research has constructed composite indices that combine personal perceptions and general statements to gauge individuals' views of risks associated with other disasters (Raahalya et al. 2023) and COVID-19 in specific (El Taha et al. 2022; Geniş et al. 2020). We further tried to construct an index by taking the average of the first, third, and fourth items (Cronbach's alpha = 0.866), but we found no marked differences between the effects of these two versions of the index on fertility desires. We chose to use the average of four items for simplicity and because of the higher internal validity of this index (Cronbach's alpha = 0.895), suggesting that it effectively captures latent concerns about the COVID-19 pandemic.

4.3 Hardships experienced during the pandemic

The second key independent variable we consider is hardships experienced during COVID-19. The survey asked respondents to rate whether each of the following had been a hardship for them over the past month: (1) lack of social interaction; (2) lack of emotional support; (3) lack of physical contact (such as handshakes, hugs, and other platonic gestures); (4) loss of income and/or financial support; (5) lack of romantic or sexual contact. Responses ranged from 1 (not a hardship) to 5 (a major hardship) and were coded as continuous variables. This question was asked in both waves.

4.4 Control variables

We controlled for covariates that may affect participants' fertility desires. Gender was a categorical variable (man or woman). Race/ethnicity was measured categorically: White, Black or African American, Hispanic, Asian or Pacific Islander, and multiracial/other race. The number of children under 18 was measured categorically: zero, one, and two or more. Marital status was measured categorically: married, in a domestic/civil partnership, never married, and separated/divorced/widowed. Age was measured as a categorical variable: 18–24, 25–29, 30–39, and 40–49. Annual family income was measured using a five-category ordinal variable: less than $20,000, $20,000–$39,999, $40,000–$79,999, $80,000–$119,999, and $120,000 or more. Education was measured as an ordinal variable indicating the highest level of educational attainment: high school degree or below, some college, and bachelor's degree or above.

4.5 Analytical strategy

First we exploited the panel nature of our data and described the trajectory of change in fertility desires across two waves (Figure 1). We also created figures to describe respondents' views on COVID-19 (Figure 2) and hardships experienced during COVID-19 (Figure 3). We then presented descriptive statistics of our sample and analyzed between-wave changes in hardships experienced during the pandemic (Table 2).

Next we estimated multinomial logistic regression models to examine the effects of COVID-specific concerns and hardships on changes in fertility desires in wave 1. Table 3 presents results from multinomial logistic regression models assessing the effects of COVID-specific concerns on the change in fertility desires between March 2020 and November 2020 (wave 1). The composite index combining different aspects of COVID-specific concerns was included as the main independent variable. Hardships experienced

and all covariates were included in all models, and all results were weighted. When presenting multinomial logistic regression results, we show average marginal effects (AMEs), which express the change in the predicted probability of an outcome in response to a one-unit change in the covariates. We present AMEs rather than regression coefficients (log-odds) for easier interpretation. To assess the robustness of the multinomial logistic regression results, we also estimated ordered logit and probit models with an ordinal dependent variable capturing the level of change in fertility desires (decreased, unchanged, and increased). These results (see Table A-3) show that the effects of COVID-specific concerns were highly consistent across model specifications.

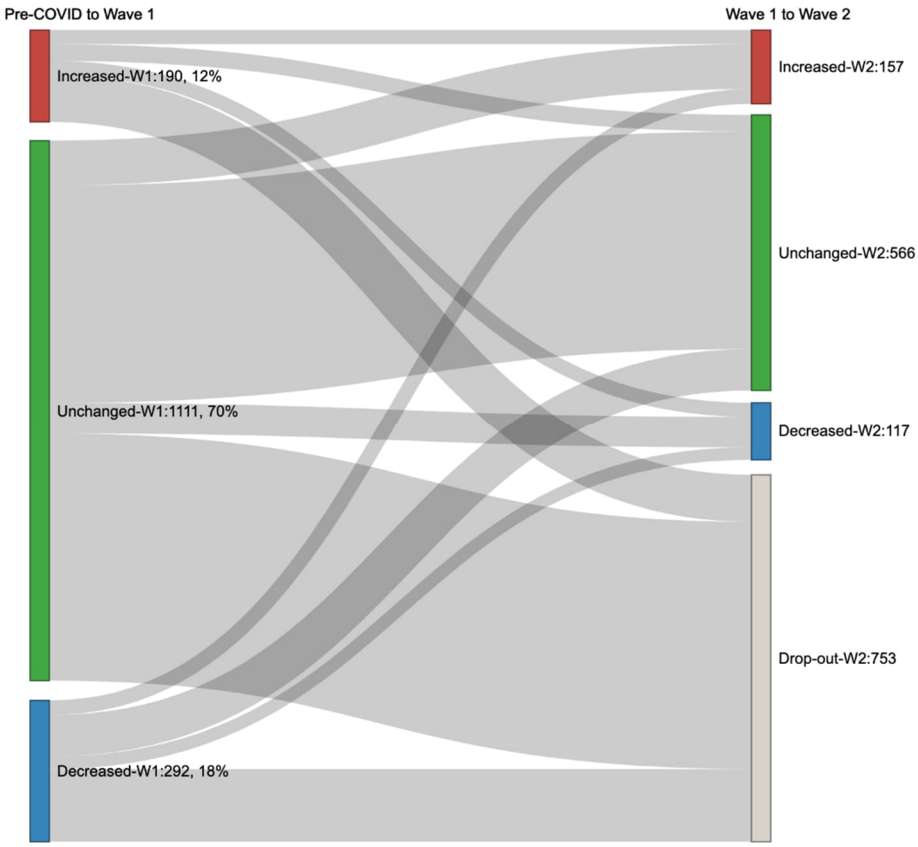
Finally, we estimated linear regression models to assess the effects of COVID-specific concerns and hardships on the level of fertility desires in wave 2. Similar to our analysis in wave 1, the composite index reflecting COVID-specific concerns was included as the main independent variable in the model. Fertility desires in wave 1 were included as a control variable. In our analyses for wave 2, we multiplied attrition weights by sampling weights to generate regression weights.

5. Results

5.1 Descriptive findings

Figure 1 depicts the changes in fertility desires observed across wave 1 and wave 2. During the period spanning March to November 2020 (wave 1), approximately 70% of our sample indicated that their fertility desires remained unchanged, while approximately 18% and 12% of respondents reported a decrease and an increase in their fertility desires, respectively. Among those respondents who remained part of the study sample for both wave 1 and wave 2 (N = 840), 53% (N = 446) reported unchanged fertility desires in both waves. Notably, among participants who initially reported a decline in fertility desires during wave 1 and continued to participate in the study (N = 142), 60% (N = 85) experienced a transition toward unchanged fertility desires in wave 2 while only 18% exhibited a further decrease in fertility desires (N = 25) during wave 2. A detailed breakdown of the number of individuals reporting each level of change in fertility desires in both waves is presented in Table A-4.

Figure 1: Flow chart of change in fertility desire across waves



The majority of our sample showed a high level of concern regarding the effects of COVID-19. Figure 2 describes the distribution of respondents' views on the COVID-19 pandemic. Around 60% of our respondents completely agreed (level = 7) or largely agreed (level = 6) that they restricted daily behaviors based on social distancing guidelines and that COVID-19 was a major threat to the health of the US population. Approximately 50% of respondents completely or largely agreed that they were worried about getting sick with COVID-19 or were worried about spreading COVID-19 to other people.

Figure 2: Respondents' views on COVID-19

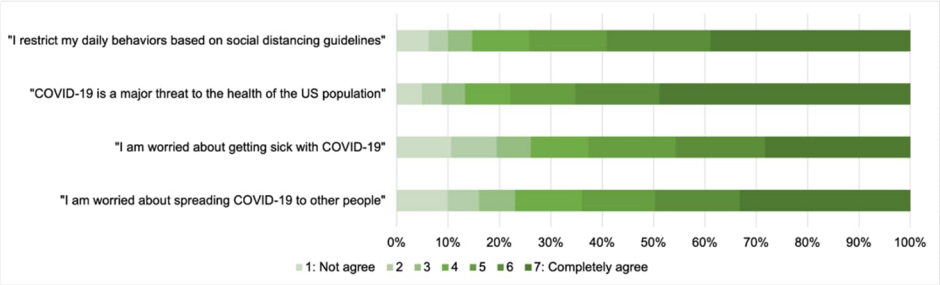
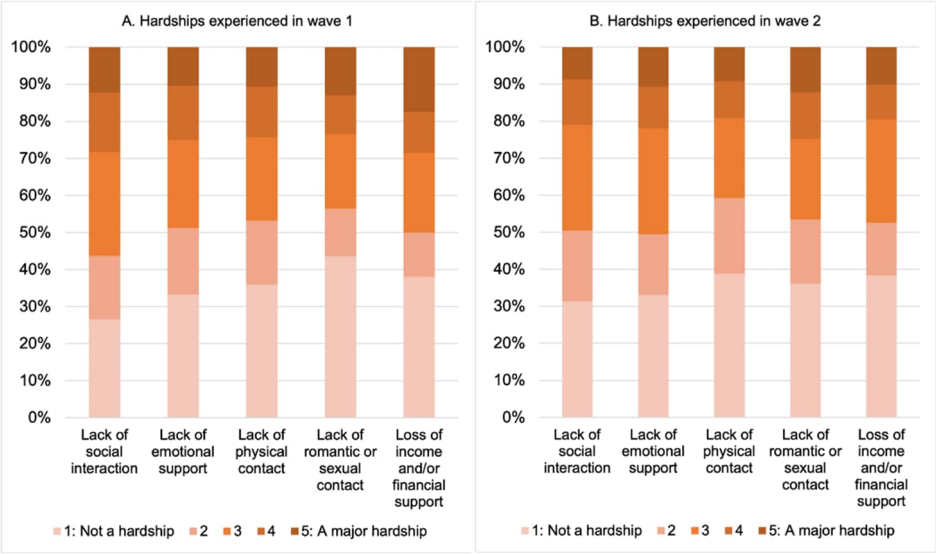


Figure 3 shows the distribution of respondents' experiences of five types of hardships in wave 1 and wave 2. In wave 1, approximately 55% of respondents experienced at least some hardships (level = 3 or higher) due to a lack of social interaction. Similarly, around 50% of respondents reported facing hardships because of a lack of emotional support or a loss of income. Roughly 45% of our sample experienced at least some hardships due to a lack of physical contact or a lack of romantic/sexual contact. By wave 2, a larger percentage of respondents experienced at least some hardships because of a lack of romantic/sexual contact. However, lower percentages of respondents encountered hardships due to a lack of social interactions, physical contact, or loss of income.

Figure 3: Hardships experienced in wave 1 and wave 2



Notes: Wave 1 sample statistics were weighted using sampling weights. Wave 2 sample statistics were weighted using the product of sampling weight and attrition weight.

Table 2 presents the descriptive statistics of the analytic sample. In wave 1, around 65% of our sample indicated that they were not at all interested in having a baby. Twenty-four percent of our sample were at least somewhat interested in having a baby. By wave 2, 63% of our sample were not at all interested in having a baby, and 25% were at least somewhat interested in having a baby. The composite index reflecting COVID-specific concerns ranged from a minimum of 1 to a maximum of 7, with an average score of 5.1 (SD = 1.7) and a median score of 5.8. Comparing hardships experienced in wave 1 and wave 2, we found that, on average, respondents experienced a lower level of hardships in wave 2 than in wave 1 due to a lack of social interactions, a lack of physical contact, and loss of income. By contrast, we found an increase in hardships due to a lack of romantic/sexual contact in wave 2 compared to wave 1, suggesting that the prolonged pandemic and social distancing protocols may have heightened desires for romantic contact.

Table 2: Sample descriptive statistics in wave 1 and wave 2

	Wave 1	Wave 2
Sample size	1,593	840
Interest in having a baby (%)		
Not at all interested	65	63
Not that interested	11	12
Somewhat interested	12	11
Very interested	6	7
Extremely interested	6	7
COVID-related concerns (index) (mean)	5.1 (1.7)	–
Hardship (mean)		
Lack of social interactions	2.70 (1.34)	2.46 (1.29)
Lack of emotional support	2.51 (1.35)	2.49 (1.34)
Lack of physical contact	2.46 (1.37)	2.32 (1.35)
Lack of romantic/sexual contact	2.37 (1.45)	2.49 (1.43)
Loss of income	2.58 (1.51)	2.33 (1.38)
Gender (%)		
Woman	50	51
Man	50	49
Race/Ethnicity (%)		
White	55	55
Asian/Pacific Islander	9	8
Black	14	14
Hispanic	21	21
Multiracial/other race	2	2
Education (%)		
High school or less	36	36
Some college	35	35
College or above	29	30
Family income (%)		
Less than $20,000	17	17
$20,000–$39,999	19	19
$40,000–$79,000	30	30
$80,000–$119,999	12	12
$120,000 or above	9	9
Missing	13	13
Age group (%)		
18–24	21	20
25–29	20	21
30–39	32	32
40–49	28	28
Marital status (%)		
Married	35	34
Domestic/civil partnership	6	6
Never married	51	52
Separated/widowed/divorced	7	8
Number of children under 18 (%)		
0	58	59
1	19	19
2+	23	22

Notes: Wave 1 sample statistics were weighted using sampling weights. Wave 2 sample statistics were weighted using the product of sampling weight and attrition weight. Percentages for each categorical variable might not sum to exactly 100% due to rounding. Standard deviations for continuous variables are reported in parentheses.

5.2 Regression results

Table 3 shows results from multinomial logistic regression models examining the relationship between COVID-specific concerns and the change in fertility desires between March 2020 and wave 1 (November 2020). To make results easier to interpret, we transformed regression coefficients (log-odds) into average marginal effects. The composite index reflecting COVID-specific concerns was included as the main independent variable in the model. The model controlled for hardships and sociodemographic variables. Firstly, we found that experiencing various types of hardships was associated with less stable fertility desires. For example, a one-unit increase in hardship due to a lack of physical contact, a lack of romantic or sexual contact, and a loss of income was associated with a 0.027 (95% CI: [–0.048, –0.006]), 0.02 (95% CI: [–0.038, –0.002]), and 0.028 (95% CI: [–0.044, –0.012]) decrease, respectively, in the predicted probability of maintaining unchanged fertility desires. Greater hardship due to a loss of income was associated with a higher likelihood of both decreased (95% CI: [0.004, 0.032]) and increased (95% CI: [–0.001, 0.022]) fertility desires, while greater hardship due to the lack of romantic or sexual contact was associated with a higher predicted probability of increasing fertility desires (95% CI: [0.004, 0.03]).

Table 3: Multinomial logistic regression model predicting change in fertility desires in wave 1 (average marginal effects)

	Dependent variable: Change in fertility desires, wave 1		
	Unchanged	Decreased	Increased
COVID-specific concerns (index)	–0.016 (0.007) [–0.031, –0.002]	0.019 (0.007) [0.006, 0.032]	–0.002 (0.005) [–0.012, 0.008]
Hardship			
Lack of social interactions	–0.005 (0.011) [–0.026, 0.017]	0.002 (0.01) [–0.017, 0.021]	0.002 (0.008) [–0.013, 0.018]
Lack of physical contact	–0.027 (0.011) [–0.048, –0.006]	0.014 (0.009) [–0.004, 0.032]	0.012 (0.008) [–0.003, 0.028]
Lack of emotional support	–0.014 (0.011) [–0.036, 0.008]	0.007 (0.01) [–0.012, 0.026]	0.007 (0.008) [–0.009, 0.022]
Lack of romantic/sexual contact	–0.02 (0.009) [–0.038, –0.002]	0.003 (0.008) [–0.013, 0.019]	0.017 (0.007) [0.004, 0.03]
Loss of income	–0.028 (0.008) [–0.044, –0.012]	0.018 (0.007) [0.004, 0.032]	0.01 (0.006) [–0.001, 0.022]
Race/ethnicity (ref = White)			
Asian/Pacific Islander	–0.031 (0.04) [–0.109, 0.048]	0.022 (0.035) [–0.047, 0.091]	0.009 (0.028) [–0.046, 0.063]
Black	–0.148 (0.037) [–0.22, –0.075]	0.045 (0.031) [–0.016, 0.106]	0.103 (0.031) [0.041, 0.164]
Hispanic	–0.019 (0.029) [–0.076, 0.038]	0.007 (0.025) [–0.042, 0.056]	0.012 (0.02) [–0.028, 0.052]
Multiracial/other race	–0.115 (0.097) [–0.306, 0.075]	0.032 (0.082) [–0.128, 0.192]	0.083 (0.077) [–0.067, 0.233]

Table 3: (Continued)

	Dependent variable: Change in fertility desires, wave 1		
	Unchanged	Decreased	Increased
Number of children (ref = 0)			
1	–0.036 (0.031) [–0.097, 0.025]	0.009 (0.027) [–0.044, 0.061]	0.028 (0.022) [–0.016, 0.071]
2+	–0.033 (0.031) [–0.093, 0.027]	0.018 (0.027) [–0.035, 0.071]	0.015 (0.021) [–0.026, 0.057]
Marital status (ref = married)			
Domestic/civil partnership	0.082 (0.05) [–0.015, 0.18]	0.024 (0.045) [–0.065, 0.113]	–0.106 (0.032) [–0.169, –0.042]
Never married	0.109 (0.031) [0.048, 0.169]	–0.006 (0.027) [–0.059, 0.047]	–0.102 (0.024) [–0.149, –0.056]
Separated/divorced/widowed	0.052 (0.05) [–0.047, 0.15]	–0.053 (0.038) [–0.128, 0.023]	0.001 (0.043) [–0.084, 0.086]
Age (ref = 18–24)			
25–29	–0.037 (0.04) [–0.115, 0.041]	–0.021 (0.033) [–0.087, 0.044]	0.058 (0.033) [–0.007, 0.124]
30–39	0.053 (0.037) [–0.019, 0.125]	–0.031 (0.032) [–0.094, 0.031]	–0.022 (0.029) [–0.079, 0.036]
40–49	0.149 (0.037) [0.076, 0.223]	–0.063 (0.033) [–0.127, 0.001]	–0.086 (0.028) [–0.141, –0.031]
Family income (ref = below $20,000)			
$20,000–$39,999	0.074 (0.04) [–0.004, 0.153]	–0.056 (0.036) [–0.127, 0.015]	–0.018 (0.028) [–0.073, 0.037]
$40,000–$79,999	0.123 (0.037) [0.049, 0.196]	–0.089 (0.034) [–0.155, –0.022]	–0.034 (0.026) [–0.084, 0.017]
$80,000–$119,999	0.11 (0.047) [0.017, 0.202]	–0.089 (0.042) [–0.171, –0.007]	–0.021 (0.034) [–0.087, 0.046]
$120,000 or above	0.09 (0.054) [–0.017, 0.196]	–0.11 (0.046) [–0.199, –0.02]	0.02 (0.043) [–0.064, 0.104]
Skipped	0.091 (0.045) [0.003, 0.178]	–0.045 (0.041) [–0.124, 0.035]	–0.046 (0.03) [–0.106, 0.014]
Education (ref = high school degree or below)			
Some college	0.024 (0.027) [–0.029, 0.076]	0.002 (0.023) [–0.043, 0.047]	–0.025 (0.019) [–0.062, 0.011]
College or above	–0.04 (0.032) [–0.104, 0.024]	0.029 (0.028) [–0.027, 0.084]	0.011 (0.024) [–0.036, 0.058]
Gender (ref = woman)	0.027 (0.023) [–0.019, 0.072]	–0.027 (0.02) [–0.066, 0.013]	0 (0.017) [–0.032, 0.033]
N	1,593		

Notes: Regression coefficients were transformed into AMEs. Standard errors are in parentheses; 95% confidence intervals are in brackets. Weights were applied in all models.

However, after accounting for the effects of these hardships, we found that COVID-specific concerns were associated with less stable fertility desires. Specifically, a one-unit increase in the index reflecting COVID-specific concerns was associated with a 0.016 decrease in the predicted probability of maintaining the same level of fertility desires (95% CI: [–0.031, –0.002]) and a 0.019 increase in the predicted probability of decreasing fertility desires (95% CI: [0.006, 0.032]). Notably, the magnitude of this association is comparable to or larger than the effects of various types of hardship. This finding suggests that in late 2020, the relationship between generalized concerns regarding the COVID-19 pandemic itself and fertility desires was independent of various

types of material and emotional hardships brought about by COVID-19 or other sociodemographic variables.[4]

Examining the sociodemographic characteristics of the respondents, we found that, on average, Black adults were less likely to have unchanged fertility desires (95% CI: [–0.22, –0.075]) and more likely to have increased fertility desires (95% CI: [0.041, 0.164]) than their White peers. Respondents who were cohabiting (95% CI: [–0.169, –0.042]) or never married (95% CI: [–0.149, –0.056]) were less likely to have increased fertility desires than their married counterparts. Those aged 40–49 were more likely to maintain unchanged fertility desires (95% CI: [0.076, 0.223]) than those aged 18–24. Regarding the effects of family income, we found that individuals with a family income below $20,000 were less likely than all other income groups to maintain unchanged fertility desires. Specifically, those in the lowest income group were more likely than those earning over $40,000 to decrease their fertility desires.

Next we examined how persistently COVID-specific concerns were associated with fertility desires, drawing on data from later stages of the pandemic. Table 4 presents results from linear regression models examining the effects of COVID-specific concerns on fertility desires in wave 2 (October–December 2021). Fertility desire measured in wave 1 was included as a control variable. Similar to the results from wave 1, we found that experiencing certain types of hardship was associated with less stable fertility desires in wave 2. For example, individuals having more hardships due to a lack of social interactions were more likely to have higher fertility desires (95% CI: [0.016, 0.17]). By contrast, experiencing hardships due to a lack of emotional support was marginally negatively associated with fertility desires in wave 2 (95% CI: [–0.158, 0.004]). Other types of hardships were not significantly associated with fertility desires in wave 2.

Table 4: Linear regression model predicting fertility desires in wave 2

	Dependent variable: Fertility desires in wave 2 (continuous)
COVID-specific concerns (index)	–0.038 (0.021) [–0.078, 0.003]
Hardship	
Lack of social interactions	0.093 (0.039) [0.016, 0.17]
Lack of physical contact	–0.009 (0.038) [–0.083, 0.065]
Lack of emotional support	–0.077 (0.041) [–0.158, 0.004]
Lack of romantic/sexual contact	0.048 (0.033) [–0.016, 0.112]
Loss of income	–0.029 (0.03) [–0.089, 0.03]

[4] We tested interactions between COVID-specific concerns and both gender and educational attainment, but the interaction effects were generally insignificant.

Table 4: Linear regression model predicting fertility desires in wave 2

	Dependent variable: Fertility desires in wave 2 (continuous)
Race/ethnicity (ref = White)	
Asian/Pacific Islander	–0.049 (0.132) [–0.307, 0.21]
Black	0.318 (0.11) [0.103, 0.533]
Hispanic	0.088 (0.093) [–0.094, 0.271]
Multiracial/other race	0.068 (0.205) [–0.334, 0.47]
Number of children (ref = 0)	
1	0.004 (0.097) [–0.187, 0.195]
2+	–0.24 (0.102) [–0.44, –0.041]
Marital status (ref = married)	
Domestic/civil partnership	–0.235 (0.163) [–0.555, 0.086]
Never married	–0.119 (0.106) [–0.327, 0.09]
Separated/divorced/widowed	–0.136 (0.147) [–0.426, 0.153]
Age (ref = 18–24)	
25–29	–0.266 (0.108) [–0.478, –0.054]
30–39	–0.096 (0.103) [–0.298, 0.107]
40–49	–0.21 (0.116) [–0.438, 0.018]
Family income (ref = below $20,000)	
$20,000–$39,999	0.196 (0.122) [–0.044, 0.435]
$40,000–$79,999	–0.166 (0.115) [–0.392, 0.06]
$80,000–$119,999	0.1 (0.149) [–0.193, 0.394]
$120,000 or above	0.131 (0.166) [–0.195, 0.458]
Skipped	–0.185 (0.132) [–0.443, 0.074]
Education (ref = high school degree or below)	
Some college	0.034 (0.083) [–0.129, 0.196]
College or above	0.078 (0.102) [–0.123, 0.279]
Fertility desire in wave 1	0.64 (0.03) [0.581, 0.699]
Gender (ref = woman)	–0.135 (0.073) [–0.278, 0.008]
Constant	1.092 (0.222) [0.656, 1.528]
N	840

Notes: Estimated coefficients are shown. Standard errors are in parentheses; 95% confidence intervals are in brackets. The products of attrition weights and sampling weights were applied in all models.

After accounting for the effects of hardships and other covariates, we found that COVID-specific concerns continued to be associated with decreased fertility desires in wave 2 (95% CI: [–0.078, 0.003]). Specifically, a one-unit increase in the composite index reflecting COVID-specific concerns was associated with a 0.04-unit decrease in

fertility desires in wave 2. Even though marginally significant, this effect provides suggestive evidence that COVID-specific concerns remained persistently associated with decreased fertility desires in wave 2, independent of the effects of hardships and sociodemographic characteristics.

Examining the effects of other sociodemographic variables, we found that Black individuals demonstrated higher levels of fertility desires than White individuals (95% CI: [0.103, 0.533]). Those with two or more children had lower fertility desires than those without children (95% CI: [–0.44, –0.041]). Regarding the effects of age, we found that respondents aged 25–29 (95% CI: [–0.478, –0.054]) and 40–49 (95% CI: [–0.438, 0.018]) had lower levels of fertility desires than those aged 18–24. Fertility desires in wave 1 were positively associated with fertility desires in wave 2 (95% CI: [0.581, 0.699]). In addition, men showed a marginally lower level of fertility desires than women (95% CI: [–0.278, 0.008]).

6. Conclusion

The COVID-19 pandemic fundamentally changed people's daily lives. As a worldwide health and economic crisis, it brought profound material and emotional challenges, as seen with other catastrophic events. What sets the COVID-19 pandemic apart is its enduring nature coupled with its vast scale and the universal implementation of COVID-19 mitigation policies. These factors suggest that the COVID-19 pandemic may have necessitated substantial changes in individuals' attitudes and behavior, at least in the short term. Even though evidence shows a decrease in fertility levels following COVID-19, mechanisms underlying fertility responses to the pandemic remain poorly understood. Previous research on fertility responses to catastrophic events suggests that disasters impact human fertility not only by introducing economic uncertainties or practical hardships but also by altering people's attitudes and behavior related to childbearing (Rodgers, John, and Coleman 2005; Wright 2022). In this study, we considered whether disruptions in fertility desires during COVID-19 can be explained by material and emotional hardships or by generalized concerns surrounding the COVID-19 pandemic itself. We showed that beyond various types of material and emotional hardships experienced during the pandemic, concerns related to the pandemic itself additionally affected people's views and their fertility desires.

Drawing on a nationally representative survey on well-being and social life during the COVID-19 pandemic in the United States, we present several main findings. First, consistent with existing evidence (Lindberg et al. 2020; Naya, Saxbe, and Dunton 2021; Yang and Kao 2024), we find that Black and lower-income individuals were less likely than their White and more advantaged counterparts to report stable fertility desires,

indicating that the greater resources of more privileged groups may have enabled them to sustain their pre-pandemic fertility desires. Second, approximately half of our sample experienced at least some material and emotional hardships in late 2020. By late 2021, our respondents reported experiencing fewer hardships due to a lack of social interactions, lack of physical contact, and loss of income. Interestingly, we observed an increase in hardships due to a lack of romantic/sexual contact, suggesting that the extended duration of the pandemic and social distancing protocols may have heightened desires for romantic contact and intensified frustrations due to the prolonged absence of romantic intimacy.

Those who experienced material and emotional hardships were less likely to report stable fertility desires in both late 2020 and late 2021. Consistent with economic theories, income loss during the pandemic was associated with less stable fertility desires. In line with psychological theories, those who lacked romantic or sexual contact reported increased fertility desires, likely reflecting proximity-seeking motivations or an intensified desire for children amid prolonged social isolation during the pandemic. However, even after we accounted for the effects of hardships, COVID-specific concerns were associated with a decrease in fertility desires in late 2020, and suggestive evidence shows that pandemic-related concerns remained negatively associated with fertility desires in late 2021. This impact may be attributed to various interconnected concerns related to the COVID-19 pandemic. COVID-19 mitigation policies, such as social distancing protocols, led to the restriction of daily activities, including regular visits to reproductive health providers and hospital visitations to friends and family members who gave birth (VanBenschoten et al. 2022). These restrictions likely induced profound uncertainties regarding the social dynamics of individuals' lives and deepened prospective parents' concerns about contracting or spreading the virus to their newborns, especially when treatment options were limited. As a result, those who valued the presence of family and friends during childbearing but were concerned about themselves or their loved ones being exposed to the COVID-19 virus may have become less willing to have babies when their daily activities were constrained and when they felt uncertain about the long-term health implications of the pandemic.

We acknowledge some limitations of our study, and we call for future research on fertility desires during COVID-19 to address these limitations. First, our analysis of the change in fertility desires is based on a retrospective measure, and we could not rule out potential recall bias. However, research during the pandemic shows that it is efficient to capture changes in fertility desires using retrospective measures during periods of extreme uncertainty (Marteleto et al. 2023). Second, while our measure for fertility desires is widely used, it does not differentiate between giving birth to a biological child and adopting a nonbiological child. This distinction is relevant to the context of this study, as those who experienced or witnessed suffering during the pandemic might be prompted

to adopt orphans but not necessarily give birth to biological children. Third, our measure for fertility desires captures only the change in the strength of fertility desires between the pre-pandemic period and wave 1, and we were unable to ascertain the specific direction of this change (from not interested to interested in having a baby or vice versa). The survey also did not collect information on the age of the youngest child, limiting our ability to assess how parental stage may have shaped fertility desires. Finally, our longitudinal data span two time points during the COVID-19 pandemic and are subject to a relatively high attrition rate. The marginally significant association between COVID-specific concerns and fertility desires in late 2021 may, in part, reflect the small sample size in wave 2. Future research would benefit from additional high-quality longitudinal data to further examine how these associations have evolved in the post-pandemic period. In particular, incorporating geographic variation in the intensity of COVID-19 mitigation policies could help capture differential exposure to pandemic-related restrictions and enrich our understanding of how local policy environments shaped fertility-related attitudes and behaviors.

Nonetheless, our results demonstrate that disruptions in fertility desires during the COVID-19 pandemic cannot simply be explained by material and emotional hardships introduced by the pandemic alone. Instead, as we have shown, multiple interconnected concerns regarding the pandemic itself have the potential to change people's attitudes and behavior, which may result in changes in fertility desires. In line with Manning et al. (2022), our findings suggest that theoretical frameworks used to explain fertility disruptions during other crises may not be applied in the same way in the case of the COVID-19 pandemic. Future work should further examine the long-term impacts of COVID mitigation policies and COVID-related health concerns on fertility during the post-pandemic era.

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Appendix

Table A-1: Regression analysis of the relationship between core demographic characteristics and the probability of dropping out in wave 2 (logistic regression model, unweighted)

	Drop-out
Male (ref = female)	0.03 (0.03)
	[–0.029, 0.089]
Asian or Pacific Islander (ref = White)	0.05 (0.03)
	[–0.009, 0.109]
Black (ref = White)	0.06 (0.04)
	[–0.018, 0.138]
Hispanic (ref = White)	0.05 (0.04)
	[–0.028, 0.128]
Multiracial/other race (ref = White)	0.02 (0.07)
	[–0.117, 0.157]
Some college (ref = high school or below)	–0.002 (0.03)
	[–0.061, 0.057]
College or above (ref = high school or below)	0.01 (0.04)
	[–0.068, 0.088]
Family income $20,000–$39,999 (ref = below $20,000)	0.04 (0.04)
	[–0.038, 0.118]
Family income $40,000–$79,999 (ref = below $20,000)	0.003 (0.04)
	[–0.075, 0.081]
Family income $80,000–$119,999 (ref = below $20,000)	0.04 (0.05)
	[–0.058, 0.138]
Family income above $120,000 (ref = below $20,000)	–0.01 (0.06)
	[–0.128, 0.108]
Family income missing (ref = below $20,000)	0.01 (0.05)
	[–0.088, 0.108]
Age 25–29 (ref = 18–24)	–0.13 (0.04)
	[–0.208, –0.052]
Age 30–39 (ref = 18–24)	–0.26 (0.04)
	[–0.338, –0.182]
Age 40–49 (ref = 18–24)	–0.34 (0.04)
	[–0.418, –0.262]
Part-time work (ref = full-time work)	0.02 (0.04)
	[–0.058, 0.098]
Disabled/retired/student (ref = full-time work)	0.01 (0.04)
	[–0.068, 0.088]
Homemaker (ref = full-time work)	0.01 (0.05)
	[–0.088, 0.108]
Other employment (ref = full-time work)	0.11 (0.12)
	[–0.125, 0.345]
Unemployed (ref = full-time work)	0.07 (0.04)
	[–0.008, 0.148]

Table A-1: (Continued)

	Drop-out
Domestic/civil partnership (ref = married)	0.03 (0.06)
	[–0.088, 0.148]
Never married (ref = married)	–0.08 (0.03)
	[–0.139, –0.021]
Separated/divorced/widowed (ref = married)	0.02 (0.05)
	[–0.078, 0.118]
One child (ref = none)	0.04 (0.03)
	[–0.019, 0.099]
Two or more children (ref = none)	0.10 (0.03)
	[0.041, 0.159]
Wave 1 change in fertility desire: decrease (ref = same)	0.03 (0.03)
	[–0.029, 0.089]
Wave 1 change in fertility desire: increase (ref = same)	–0.02 (0.05)
	[–0.118, 0.078]
Wave 1 fertility desire: not that interested (ref = not at all interested)	–0.02 (0.04)
	[–0.098, 0.058]
Wave 1 fertility desire: somewhat interested (ref = not at all interested)	–0.02 (0.04)
	[–0.098, 0.058]
Wave 1 fertility desire: very interested (ref = not at all interested)	0.11 (0.06)
	[–0.008, 0.228]
Wave 1 fertility desire: extremely interested (ref = not at all interested)	0.04 (0.06)
	[–0.078, 0.158]
Observations	1,593

Notes: Estimated coefficients are shown. Standard errors are in parentheses; 95% confidence intervals are in brackets.

Table A-2: Comparison of descriptive statistics: Original wave 1 sample, followed-up subsample, attrition subsample, and followed-up subsample weighted by attrition weights

	Original wave 1 sample	Attrition subsample	Followed-up subsample	Followed-up subsample, weighted by attrition weights
Sample size	1,593	753	840	840
Interest in having a baby in wave 1 (%)				
Not at all interested	65	65	65	63
Not that interested	11	10	11	11
Somewhat interested	12	12	13	13
Very interested	6	7	5	6
Extremely interested	6	6	6	7
COVID-related concern index (mean)	5.1 (1.7)	5.1 (1.7)	4.9 (1.8)	5.1 (1.7)
Gender (%)				
Woman	50	48	51	51
Man	50	52	49	49
Race/ethnicity (%)				
White	55	52	59	55
Asian/Pacific Islander	9	10	8	8
Black	14	14	13	14
Hispanic	21	23	19	21
Multiracial/other race	2	1	2	2
Education (%)				
High school or less	36	37	34	36
Some college	35	36	34	35
College or above	29	26	32	30
Family income (%)				
Less than $20,000	17	17	17	17
$20,000–$39,999	19	19	18	19
$40,000–$79,000	30	30	31	30
$80,000–$119,999	12	12	12	12
$120,000 or above	9	8	10	9
Missing	13	14	12	13
Age group (%)				
18–24	21	29	13	20
25–29	20	22	19	21
30–39	32	29	34	32
40–49	28	20	34	28
Marital status (%)				
Married	35	36	35	34
Domestic/civil partnership	6	6	6	6
Never married	51	51	52	52
Separated/widowed/divorced	7	7	8	8
Number of children under 18 (%)				
0	58	53	63	59
1	19	20	18	19
2+	23	26	19	22

Note: The first three columns were weighted using sampling weights. The fourth column was weighted using the product of sampling weight and attrition weight. Standard deviations for continuous variables are reported in parentheses.

Table A-3: Sensitivity analysis: Ordered logit and ordered probit models predicting change in fertility desires, wave 1

Dependent variable: Change in fertility desires (ordinal: decreased, unchanged, increased)		
	Ordered Logit Model	Ordered Probit Model
COVID-specific concerns (index)	–0.070 (0.030)	–0.040 (0.020)
	[–0.129, –0.011]	[–0.079, –0.001]
Hardships		
Lack of social interactions	–0.001 (0.060)	–0.001 (0.030)
	[–0.119, 0.117]	[–0.060, 0.058]
Lack of physical contact	–0.010 (0.060)	0.000 (0.030)
	[–0.128, 0.108]	[–0.059, 0.059]
Lack of emotional support	0.001 (0.060)	–0.001 (0.030)
	[–0.117, 0.119]	[–0.060, 0.058]
Lack of romantic contact	0.070 (0.050)	0.040 (0.030)
	[–0.028, 0.168]	[–0.019, 0.099]
Loss of income	–0.040 (0.040)	–0.020 (0.020)
	[–0.118, 0.038]	[–0.059, 0.019]
Race/ethnicity (ref = White)		
Asian/Pacific Islander	–0.020 (0.200)	–0.020 (0.110)
	[–0.412, 0.372]	[–0.236, 0.196]
Black	0.150 (0.180)	0.100 (0.090)
	[–0.203, 0.503]	[–0.076, 0.276]
Hispanic	0.020 (0.150)	0.010 (0.080)
	[–0.274, 0.314]	[–0.147, 0.167]
Multiracial/other race	0.160 (0.480)	0.110 (0.250)
	[–0.781, 1.101]	[–0.380, 0.600]
Number of children (ref = 0)		
1	0.070 (0.160)	0.050 (0.080)
	[–0.244, 0.384]	[–0.107, 0.207]
2+	–0.070 (0.160)	–0.020 (0.080)
	[–0.384, 0.244]	[–0.177, 0.137]
Marital status (ref = married)		
Domestic/civil partnership	–0.510 (0.250)	–0.290 (0.140)
	[–1.000, –0.020]	[–0.564, –0.016]
Never married	–0.400 (0.160)	–0.220 (0.080)
	[–0.714, –0.086]	[–0.377, –0.063]
Separated/divorced/widowed	0.230 (0.240)	0.110 (0.130)
	[–0.240, 0.700]	[–0.145, 0.365]

Table A-3: (Continued)

Dependent variable: Change in fertility desires (ordinal: decreased, unchanged, increased)		
	Ordered Logit Model	Ordered Probit Model
Age (ref = 18–24)		
25–29	0.290 (0.190)	0.150 (0.100)
	[–0.082, 0.662]	[–0.046, 0.346]
30–39	0.050 (0.170)	0.020 (0.100)
	[–0.283, 0.383]	[–0.176, 0.216]
40–49	–0.150 (0.190)	–0.090 (0.100)
	[–0.522, 0.222]	[–0.286, 0.106]
Family income (ref = below $20,000)		
$20,000–$39,999	0.120 (0.190)	0.070 (0.100)
	[–0.252, 0.492]	[–0.126, 0.266]
$40,000–$79,999	0.170 (0.180)	0.090 (0.100)
	[–0.183, 0.523]	[–0.106, 0.286]
$80,000–$119,999	0.210 (0.230)	0.120 (0.120)
	[–0.241, 0.661]	[–0.115, 0.355]
$120,000 or above	0.420 (0.270)	0.230 (0.140)
	[–0.109, 0.949]	[–0.044, 0.504]
Skipped	–0.040 (0.220)	–0.020 (0.120)
	[–0.471, 0.391]	[–0.255, 0.215]
Education (ref = high school degree or below)		
Some college	–0.120 (0.140)	–0.070 (0.070)
	[–0.394, 0.154]	[–0.207, 0.067]
College or above	–0.080 (0.160)	–0.040 (0.090)
	[–0.394, 0.234]	[–0.216, 0.136]
Gender (ref = woman)	0.130 (0.120)	0.070 (0.060)
	[–0.105, 0.365]	[–0.048, 0.188]
Intercepts: decrease | unchanged	–1.930 (0.360)	–1.120 (0.190)
	[–2.636, –1.224]	[–1.492, –0.748]
Intercepts: unchanged | increased	1.690 (0.350)	1.030 (0.190)
	[1.004, 2.376]	[0.658, 1.402]
N	1,593	1,593

Notes: Estimated coefficients are shown. Standard errors are in parentheses; 95% confidence intervals are in brackets. Weights were applied in all models.

Table A-4: Trajectories of change in fertility desires across waves

		Change in fertility desires, wave 1			
		Unchanged	Decreased	Increased	Total
Change in fertility desires, wave 2	Unchanged	446	85	35	566
	Decreased	62	25	30	117
	Increased	96	32	29	157
	Dropped out	507	150	96	Dropped out
	Total	1,111	292	190	2,433