

Narratives of the future and fertility decision-making in uncertain times. An application to the COVID-19 pandemic

Raffaele Guetto^{1,*} , Giacomo Bazzani¹ , and Daniele Vignoli¹ 

Abstract

The sociological and demographic literatures have widely demonstrated that fertility decisions are shaped by individuals' previous life experiences and socioeconomic status – i.e., the “shadow of the past.” However, rising uncertainty in contemporary societies necessitates an analytical framework that acknowledges the influence of the future in the fertility decision-making process. Based on the Narrative Framework, we argue that personal narratives of the future, and their constitutive elements of expectations and imaginaries – i.e., the “shadow of the future” – represent crucial drivers of fertility intentions under conditions of uncertainty. Our arguments are tested empirically by exploiting the exogenous uncertainty shock provided by the COVID-19 pandemic, and unique data we collected during the Italian lockdown. Results suggest that, because of COVID-induced uncertainty, subjective perceptions and personal narratives of the future – also shaped by media “shared narratives” – gained the upper hand over the shadow of the past in influencing fertility intentions. In addition, we provide evidence of a causal impact of shared narratives of the future on fertility intentions through an online experiment simulating a “real” exposure of the respondents to a new media narrative on the expected length of the emergency.

Keywords: uncertainty; fertility; COVID-19; narratives

1 Introduction

Uncertainty – a condition with unknown probability distributions of future outcomes – represents an intrinsic characteristic of contemporary societies. The ideas of “risk

¹University of Florence, Florence, Italy

*Correspondence to: Raffaele Guetto, raffaele.guetto@unifi.it

society,” “reflexive modernity,” or “liquid modernity” describe a historical trend of the last decades in which uncertainty is a new feature of social change (Bauman, 2000; Beck, 1992; Giddens, 1991). More than a century ago, Karl Marx designated modernity itself as a novel era in which “all that is solid melts into air” (1848/2020, p. 475), but the increasing speed of technological change, the constant flows of financial capital across the globe, labor market reforms and, more recently, climate change and its social consequences have expanded the sources of uncertainty. These conditions of uncertainty affect private lives (Sennett, 1998) and family life courses (Kreyenfeld et al., 2012; Mills and Blossfeld, 2013). Embedded in such a contemporary scenario, the COVID-19 pandemic of 2020, and the responses to the outbreak, escalated the uncertainty at the core of the public debate and personal lives. Policy-makers, but also scientists, have no clear answers to the questions of how long the pandemic will last, and what the real consequences will be for public health, as well as for other social and economic outcomes. Especially in countries that implemented nationwide lockdowns, people started to feel insecure in their daily lives due to the risk of contagion, which also depended on others’ “safe” behavior. The possibility of losing one’s job and/or having a reduced standard of living is a widespread renewed source of concern in response to a looming economic future that nobody can forecast, even in the short term. This additional condition of uncertainty can be seen as an ancillary outcome of globalization, as the rapid diffusion of the pandemic is also related to the large volume of exchanges and global interdependencies (Kaufmann, 2009).

Thus, while media reports speculated about a surge in “corona-babies” conceived during the pandemic and its related lockdowns, it seems plausible to expect an additional negative impact on family formation due to the increasing uncertainty about the future, at least in high-income countries (Aassve et al., 2020). In this article, we explore the consequences that the rising uncertainty induced by the COVID-19 pandemic may have for fertility intentions. The latter reflect the combined effects of desired fertility and situational constraints (Billari et al., 2009), and have been generally regarded as a fairly reliable predictor of behavior, provided that a time frame for their realization is set (Schoen et al., 1999; Westoff and Ryder, 1977).

The pandemic occurred within a context of demographic change in which fertility rates in many countries in Europe and the US had been declining during much of the 2010s. The underlying nature of this decline is still a conundrum for demographers and sociologists. Fertility decreased dramatically both in already low-fertility countries of Southern Europe that were severely affected by the economic and social consequences of the Great Recession; and in Nordic countries such as Norway and Finland, which experienced an almost immediate recovery of economic growth, and where the institutional context continued to provide a more favorable environment for childbearing. There have been several empirical attempts to understand the reasons underlying the fertility decline after 2008, but even studies that simultaneously included several indicators of economic conditions, such as the unemployment rate, foreclosure rates and the cost of public debt, were not able to

fully explain the relatively homogeneous fertility contractions that Western societies are currently facing (e.g., [Comolli, 2017](#); [Goldstein et al., 2013](#); [Matysiak et al., 2020](#); [Schneider, 2015](#)). This is because, we posit here, objective indicators of individuals' employment and economic conditions subsume the "statistical shadow of the past" ([Davidson, 2010](#), p. 17), which tells us little about the uncertain future that people experienced during the crisis.

We argue that research on fertility decisions in uncertain times needs to partly shift its perspective, recognizing that uncertainty is a forward-looking notion. The study of the influence of the future in decision-making processes has a long tradition in the social sciences, and there has been renewed interest in this topic in recent years. We rely on the Narrative Framework for the analysis of fertility intentions ([Vignoli et al., 2020a, 2020b](#)), which is based on recent developments in economic sociology on decision-making under conditions of uncertainty ([Beckert, 2016](#); [Beckert and Bronk, 2018](#)). This future-oriented framework represents a novelty in the study of fertility decision-making processes, and it is obviously applicable to the analysis of the consequences of the COVID-19 emergency. The pandemic, and the related lockdowns, indeed represent a situation in which the ordinary temporal orientation is suspended: the degree of "clarity" with which the future is imagined is reduced, and the future horizon is "contracting" because forecasting is more difficult than it was before ([Mische, 2009](#), p. 700). During the pandemic, the expected future has been shaped by individuals' direct exposure to the SARS-CoV-2 virus – i.e. by their own or their close relatives' exposure to contagion and subsequent social isolation, hospitalization, or even death – and the economic consequences of the pandemic, such as job loss or temporary inactivity due to a lockdown. However, for the majority of the population who have not experienced severe health and economic consequences due to the pandemic, expectations are shaped by the spread of *shared narratives* of an uncertain future ([Vignoli et al., 2020b](#)), especially those channeled by the media and related to the diffusion of the virus, government restrictions and the scientific debate about when the pandemic will be over ([Egidi and Manfredi, 2021](#)).

In Italy, our case study, the COVID-19 disaster has created an enormous uncertainty shock, which, without operationalizing the whole Narrative Framework, allows us to make a first explorative attempt to test empirically the influence of the "shadow of the future" ([Bernardi et al., 2019](#), p. 4; [Huinink and Kohli, 2014](#), p. 1303) on fertility intentions under conditions of uncertainty. Italy was affected more strongly by the 2008 recession and by the public debt crisis than many other industrialized countries. While Italy had a total fertility rate of 1.46 in 2010, it reverted to a *lowest-low* fertility regime in 2019, with a total fertility rate of 1.29, which was the lowest in Europe. On top of that, Italy was the first country in the Western world to be severely hit by the COVID-19 pandemic, with Italians experiencing the longest complete and nationwide lockdown, which started on March 9 and ended on May 4, 2020. Because of COVID-induced uncertainty, subjective perceptions and personal narratives of the future – which are also influenced by media-channeled shared narratives – may gain the upper

hand over the “shadow of the past” for fertility intentions. What has happened to childbearing plans during this unexpected period of uncertainty about the future? Have fertility intentions been negatively affected by the pandemic? Can the impact of the pandemic be explained by people’s objective exposure to the virus and its related socioeconomic consequences, or is it better grasped by exploring people’s rising uncertainty about the future, which has also been spread by the media?

To address these questions, we make use of unique data that we collected during the spring 2020 lockdown on a sample of Italians of reproductive ages. We measured individuals’ expectations concerning the duration of the pandemic emergency and family imaginaries, contrasting their effects on fertility intentions during the lockdown with those of past experiences, and the individuals’ objective levels of exposure to the pandemic and its socioeconomic consequences. In addition, we provide empirical evidence of a causal impact of shared narratives of the future on fertility intentions by making use of online experimentation, an innovative approach to the study of the impact of the future in decision-making processes. Our experiment simulates a “real” exposure of respondents to a new media narrative. Respondents were randomly assigned to read different mock news bulletins concerning the expected end of the pandemic emergency in Italy, each of which presented a different expected duration of the crisis before a return to normality. We then compared their post-treatment and pre-treatment fertility intentions.

2 Uncertainty and fertility: The Narrative Framework

Much of the literature on fertility is based on the study of the social determinants of fertility, which mainly accounts for the influence of what already happened in previous stages of the life course, and thus considers factors such as educational attainment, previous (un)employment episodes and partnership histories (Barbieri et al., 2015; Busetta et al., 2019; Kreyenfeld et al., 2012; Vignoli et al., 2020c). These experiences are shaped during socialization and by personal predispositions, like risk aversion or time discounting preferences, which may also have a direct influence on fertility choices (Bellani et al., 2021; Schmidt, 2008). Psychological predispositions, cumulative past experiences over the life course and the present socioeconomic status are the standard elements usually identified as determinants of fertility intentions and behaviors (Busetta et al., 2019; Dantis and Rizzi, 2020; Mills and Blossfeld, 2013; Vignoli et al., 2012), and are aspects that need to be controlled for in any empirical model of fertility intentions. However, this “driven-by-the-past framework” (Seligman et al., 2013, p. 127) makes agency and choice difficult to understand, as fertility decision-making is a complex process that is influenced, but not determined, by past experiences.

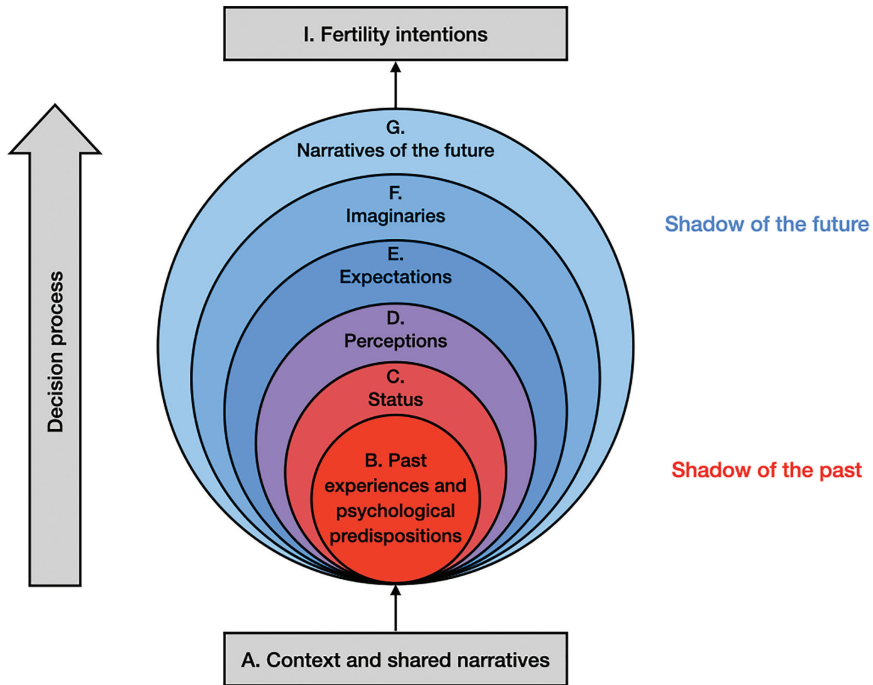
The influence of the future on the course of action is difficult to conceptualize and operationalize in empirical research. The pragmatist philosophical tradition devoted special attention to the role of the future in the course of action. Following this approach, we can posit that future expectations are not just determined by

pre-existing cognitive schemas or typification (Schütz, 1962), but are deeply imbued with imaginative capacity (Dewey, 1922/1930; Mead, 1932/2002). Of course, not all human actions are the result of deliberative thinking. According to Dewey, the ordinary course of action is an unreflective flow of activities in which “habits do all the perceiving, recalling, judging, conceiving and reasoning that is done” (1922/1930, p. 177). However, the ordinary, unconscious course of action can be interrupted by the emergence of conflict between “different habits, or by the release of impulses,” or when the actor is confronted with a “new and surprising situation” (Beckert, 2016, p. 54) in which the expected outcome of the ordinary routine no longer seems to apply. At this point, people experience uncertainty about the future, and the deliberative process emerges, as the situation requires a (new) judgement. In a situation of uncertainty, past experiences and expectations come into play in an imaginative “dialogue” in which “competing possible lines of action” are considered because “deliberation is an experiment in finding out what the various lines of possible action are really like” (Dewey, 1922/1930, p. 190). The influence of the future in fertility plans has previously been considered in the New Home Economics approach (Becker, 1981) and the psychological Theory of Planned Behavior (Ajzen, 1991; Ajzen and Klobas, 2013). However, these approaches undermined the role of human agency, and failed to provide a systematic framework to account for its importance in explaining fertility dynamics.¹ The Narrative Framework – presented in Figure 1 – identifies the key elements that are involved in this future-oriented deliberative process: expectations, imaginaries and personal narratives of the future, which define what can be referred to as the “shadow of the future” that influences the decision-making process.

The figure represents the different steps of a stylized decision-making process. Each element of the framework stems from the previous ones, but can also exceed them and have an independent effect on fertility decision-making. Although these

¹ From a microeconomic perspective, Becker (1981) and the New Home Economics consider fertility behavior as an individual action oriented toward utility maximization. Expected utility is a forward-looking concept, even though the concept of *utility* remains largely undefined (Strandbakken, 2017). The application of a strict economic approach to fertility behavior may create an unrealistic type of family agency, in which individuals *calculate* and *discount* the actual cost of a child in the light of future utility (Caldwell, 1982). Usually, human actions are a mix of different types of agency (Emirbayer and Mische, 1998; Weber, 1922/1978). Fertility decisions are particularly complex decisions in which interests, values, opportunities and social ties interact (Vignoli et al., 2020a, p. 30). According to the Theory of Planned Behavior (TPB) (Ajzen, 1991), an action is the result of actors’ *attitudes toward the behavior*, *subjective norms* (dependent on the relevant others’ perceptions of the behavior) and *perceived behavioral control* (self-efficacy) (Ajzen and Klobas, 2013). Perceived behavioral control is clearly a forward-looking concept. However, the TPB set of elements still relies on a deterministic approach to fertility behavior, disregarding an individual’s capacity to deviate from the expected course of action. Hence, from our perspective, the TPB misses one crucial element in its forward-looking approach: namely, the imaginative capacity of human agency. Moreover, the empirical validation of the TPB is highly problematic and much debated (Schoen et al., 1999), especially in terms of the role of background factors and structural constraints (Mencarini et al., 2015).

Figure 1:
The Narrative Framework for the analysis of the fertility decision-making process



elements are not meant to follow any strict order in actual decision-making, from an analytical point of view, it is useful to start considering psychological predispositions, past experiences (B) and current (socioeconomic) status (C), which represent a set of opportunities and constraints for childbearing plans. A recent stream of literature has introduced personal *perceptions* (D) of past and current experiences as a way to introduce agency into empirical models of fertility intentions and behavior, and they account for the fact that people may react very differently to the same objective experiences and economic conditions (Kreyenfeld, 2010, 2015). Individuals' perceptions have been found to play an independent role net of objective indicators of individuals' past and current labor market situations (e.g., Bhaumik and Nugent, 2011; Fahlén and Oláh, 2018), and to moderate the impact of these indicators on fertility intentions (Vignoli et al., 2020d) and behavior (Kreyenfeld, 2015). This approach is in line with the Thomas theorem, which posits that the interpretation of a situation causes the action (Thomas and Thomas, 1928). While perceptions of insecurity are related to individuals' current circumstances, they obviously refer to possible future events or threats. However, individuals' subjective evaluations of the (in)security of their current conditions only implicitly entail a reference to the future. In this sense, perceptions are somewhat “in between”

the shadow of the past and the shadow of the future. To address theoretically and empirically the role of uncertainty in fertility decisions, a conceptualization that explicitly acknowledges its *forward-looking nature* is needed.

In Figure 1, *expectations* (E) are the first step into the shadow of the future, as they represent what people expect will happen in the future based on the available information. Although expectations may arise from past experiences, they are often connected to a shadow of the future, and, thus, become an independent source of agency. For instance, working with a fixed-term contract may not negatively affect an individual's fertility intentions if he/she believes that economic growth will be strong or that permanent employment opportunities will increase.

However, expectations do not account for the full influence of the future on the course of action, as *imaginaries* (F) may shape and deviate from an expected future. Imagination is the capacity to place oneself in one or more imagined situations, while also hypothesizing alternative courses of action and their effects. But imagination, more radically, also allows individuals to imagine a possible future that cannot be deduced from their present circumstances. Personal imaginaries may be easily influenced by social norms and relevant others' opinions, but may also deviate from them, and can thus move the decision-making process in a different direction. For instance, while the two-child norm is widespread in wealthy countries (Sobotka and Beaujouan, 2014), a personal family imaginary may revolve around a one-child or even a childless family. Imaginaries constitute a less abstract point of reference than social norms because they represent wishful (or fearful) projections into the future, which arise from the capacity of human agency to shift away from the expected course of action (Emirbayer and Mische, 1998). Imaginaries may play a crucial role in decision-making, and especially when making decisions that are likely to have complex and long-term outcomes, as in the case of fertility decisions. Long-term outcomes cannot be forecast, and/or each possible future may involve both positive and negative expectations. A normative orientation related to personal imaginaries ("How I would (not) like the future to be") may come into play and orient deliberation, shedding a special light on the different pros and cons implied by the available options, and thus help to orient the decision. A psychological mechanism compatible with the importance of imaginaries can be found in the "affective forecasting theory," which posits that people base their decisions on affective forecasts; i.e., on their predictions about their own emotional reactions to future events (Wilson and Gilbert, 2003). Demographic research has shown that the happiness of parents-to-be increases before childbirth (Myrskylä and Margolis, 2014), and that the anticipation of an increase (or a decrease) in one's own happiness from having a(nother) child may influence the decision to have the child at all (Billari, 2009). According to the Narrative Framework, family imaginaries represent the source of the "expected happiness" from childbearing, and, thus, have a dual effect on the cognitive process of deliberation. First, they provide a frame in which the current status (C) and the perception of the current status (D) are interpreted and evaluated, and which cannot be reduced to expectations (E), such as whether or not the (un)employment situation influences childbearing plans. Second, they represent

an independent source of a conscious desire for a change in the future; i.e. they may provide a life goal, irrespective of the shadow of the past and (more or less plausible) expectations.

Personal narratives of the future (G) reflect the contingent plan for reaching the goals set by the imaginaries. As Figure 1 suggests, narratives do not just add an additional element to the framework; rather, they represent the less abstract level of the decision-making process, in which the shadow of the past, expectations and imaginaries find their proper places, and, at this level, influence fertility intentions (Vignoli et al., 2020a). All previous elements in the framework are selected, interpreted and included in a personal narrative of the future, which also entails a hypothetical course of action and the causal interconnection of these elements.

Life course decisions like fertility decisions necessarily involve a conscious narrative of the future, which embodies the causal path that people deem necessary to reach their imagined goal. Expectations, imaginaries and narratives of the future might facilitate or inhibit fertility in conditions of uncertainty. They might foster fertility in line with the socio-psychological uncertainty reduction framework from Friedman et al. (1994), who argued that more economically vulnerable women may respond to uncertain life prospects by choosing to become a mother, which gives meaning and stability to their lives. However, empirical evidence suggests that people, and especially young people, usually build their personal narratives to act in accordance with a condition of economic uncertainty in order to avert risk (McDonald, 2002; Schmidt, 2008). Young adults tend to postpone making long-term, binding decisions, such as decisions about marriage and childbearing, until they become more settled in the labor market (Mills and Blossfeld, 2013), and such tendencies may be particularly strong in a country like Italy, which is characterized by the “postponement syndrome” (Livi Bacci, 2001), and where the perceived economic preconditions for family formation seem very high (Vignoli et al., 2020b). Moreover, a family imaginary may revolve around the desire to remain childless. For these individuals, all of the previous elements of the Narrative Framework play only a marginal role in defining the personal narrative that influences their fertility decisions.

Individual actors are not the only “authors” of their own narratives of the future, as they are influenced by factors external to them, in the form of *context and shared narratives* (A). The “context” usually considered in comparative analyses of fertility is related to the institutional setting, prevailing values and long-term cultural continuities (Balbo et al., 2013). However, above and beyond the influence of these contextual factors, a last element of our Narrative Framework is represented by *shared narratives* (A): i.e. narratives of the future adopted by relevant others such as parents and peers, or conveyed by the media (Vignoli et al., 2020b). Parental pressure is likely to influence young people’s family plans, especially in a “strong family” setting in which young adults tend to leave their family of origin relatively late, such as in Southern European countries (Billari, 2004). This is a situation that may not apply to other Western European countries, where the influence of peers may be more relevant (Di Giulio and Rosina, 2007; Guetto et al., 2016). However, in

recent years, a major source of influence in globalized societies is the unprecedented access to press and new (social) media, which may shape individuals' perceptions, expectations and imaginaries.

Media-channeled shared narratives have started to play a major role in spreading feelings of uncertainty about the future in recent decades, and the media coverage of economic issues has increased substantially, especially after the 2008 crisis, in both Europe and the US (Baker et al., 2016). This constant (over-)flow of information, which was further intensified after the start of the pandemic (Altig et al., 2020), is likely to exacerbate individuals' feelings of uncertainty about the future because of the prevailing tone and angles of media reports (Alsem et al., 2008; Dräger, 2015). Schneider (2015) suggested that press coverage comes closer to measuring the sentiments that shape economic uncertainty and that affect fertility decisions than actual economic constraints. More recently, the European sovereign debt crisis has received considerable attention in the media, and the simplified narratives presented in the press have served as a multiplier of uncertainty, contributing to shrinking birth rates (Comolli and Vignoli, 2021).²

3 Adapting the Narrative Framework to the COVID-19 pandemic

In this paper, we propose an application of the Narrative Framework outlined above to the study of fertility intentions during the COVID-19 pandemic outbreak, with an empirical focus on the first nationwide lockdown implemented in Italy. Although this empirical exercise does not aim to operationalize the whole theoretical scheme presented so far, two sets of hypotheses refer to the “shadow of the past” of COVID-induced uncertainty (Hypotheses **H1a**, **H1b**) and to the “shadow of the future” of pandemic uncertainty and personal family imaginaries (Hypotheses **H3a**, **H3b**). Given their liminal positioning at the intersection between the two “shadows” (Figure 1), a specific hypothesis (**H2**) refers to the role of perceptions related to personal and general situations. We also take into account the role of media shared narratives during the pandemic, and their possible *causal* impact, through an *ad hoc* experiment (Hypothesis **H4**).

The pandemic has exogenously exposed people of reproductive ages to a new environment characterized by a high level of uncertainty. This new, uncertain situation affects individuals through two main mechanisms: the health and economic consequences of the pandemic and related government restrictions (*context*) on the one hand, and exposure to the (social) media coverage of the pandemic (*shared narratives*) on the other.

² A more detailed discussion of the functions of personal narratives and the interconnections between the different elements of the Narrative Framework would be beyond the scope of the paper, but can be found in Vignoli et al. (2020a).

The pandemic context has led to important changes in individuals' objective status, first and foremost in terms of the potential health consequences of direct exposure to the SARS-CoV-2 virus. Apart from those individuals who needed hospitalization because they had more severe symptoms, people who tested positive for the virus had to face quarantine and social isolation, and even many untested people were put in quarantine because of a suspicion that they or their close relatives or acquaintances had been infected. The uncertainty created by this unexpected situation is likely to hinder childbearing plans, both directly and indirectly due to induced perceptions of insecurity, which leads to our first hypothesis:

Hypothesis 1a. Personal, close relatives' or acquaintances' exposure to the SARS-CoV-2 virus negatively affects pre-pandemic fertility intentions.

The economic consequences of the pandemic have been even more widespread. During the first lockdown, which started on March 9, 2020, Italians were prohibited from leaving their homes, except to engage in work activities deemed "essential," to buy food, or in cases of utter emergency. The most fortunate workers – usually highly educated individuals employed in skilled jobs and in regular forms of dependent employment – shifted to working from home, and did not face a serious risk of being laid off or suffering earning losses, especially if they were public sector employees. However, the Italian National Institute of Statistics (ISTAT) estimated that approximately one-third of the total labor force were employed in economic sectors whose activities were suspended, especially in the private sector, in which almost half of firms were affected by government restrictions (ISTAT, 2020). This meant that millions of suspended employees had to rely on wage guarantee funds, which entailed a 35% average reduction of the usual salary; whereas many self-employed individuals, especially in the consumer services sector, had to temporarily interrupt their activities with limited or no earnings, apart from discretionary lump-sum transfers provided by the government to help them weather the emergency. Finally, many workers lost their jobs, although the exact numbers of such workers are difficult to estimate, especially if they were employed with temporary contracts or in the black economy. Restrictions were gradually loosened by the government up to the end of the lockdown on May 4, 2020. Many businesses, such as bars and restaurants, did not re-open until the beginning of June, and travel between Italian regions (NUTS-2) without any certified urgent reason was not allowed until June 3, 2020. In light of the available empirical evidence concerning the negative effects of unemployment and more unstable labor market conditions on fertility in Italy (Alderotti et al., 2021; Busetta et al., 2019), this objective situation of economic uncertainty leads to the next hypothesis:

Hypothesis 1b. The experiences of work suspension and/or job loss because of government restrictions negatively affect pre-pandemic fertility intentions.

The new context created by the pandemic and government restrictions influenced many aspects of individuals' objective status, which, together with their past experiences and psychological predispositions, are part of the shadow of the past

in the fertility decision-making process during the COVID-19 pandemic. However, the pandemic context also influenced more subjective states through exposure to media shared narratives. Indeed, during the lockdown, most people were informed about the diffusion of the pandemic and government decisions only by the (social) media, which focused heavily on trends in the diffusion of coronavirus infections. During this period, Italians gathered in front of their TVs every day at 6 p.m. to get the official updates concerning the daily numbers of hospitalized individuals and deaths from the Civil Protection's press conference. The daily news of coronavirus deaths and infections was a major source of concern for the population in this period. In the first half of April 2020, at the peak of the pandemic and in the middle of the lockdown period, Italy recorded an average of 700 COVID-related deaths per day. As of April 15, Italy had approximately 150,000 positive cases and 20,000 official deaths, which were the highest numbers in Europe at that time. It is important to note that these figures are difficult to compare across countries due to various kinds of biases in the identification of the exact cause of death (Odone et al., 2020).³ Nonetheless, the awareness of these official numbers is likely to have shaped individuals' perceptions of the seriousness of the emergency, and to have added a generalized feeling of insecurity to individuals' baseline psychological predispositions to risk aversion, even among those who were not directly exposed to the objective socioeconomic consequences of the pandemic. This leads to our next hypothesis:

Hypothesis 2. Perceptions of insecurity across several life domains due to the pandemic negatively affect pre-pandemic fertility intentions.

The public media discourse in Italy was filled with heated debates among virologists, politicians and opinion leaders on issues such as “the exponential growth of infections,” the need for “measures to flatten the curve” and whether (and which types of) masks are useful to slow down the pandemic, often with contradictory messages (Ruiu, 2020). In line with our Narrative Framework, people were thus exposed to a high degree of uncertainty about their future, and had to form their own expectations about when the return to pre-pandemic conditions would occur. Expectations are the first element of the shadow of the future that have influenced fertility intentions during the pandemic:

Hypothesis 3a. The expectation that the return to pre-pandemic conditions will take a long time negatively affects pre-pandemic fertility intentions.

³ The very high apparent mortality rate associated with COVID-19 in Italy was most likely attributable to a combination of several factors, above all Italy's age population structure. In addition, the elderly have been particularly hard hit by the pandemic because of the spread of Sars-CoV-2 in nursing homes (Bernardi et al., 2021; Trabucchi and Diego De Leo, 2020). Finally, especially in the early stages of the pandemic and in Lombardy, the most severely affected Italian region, only people with serious symptoms were tested. Thus, the actual numbers of asymptomatic or paucisymptomatic infected individuals were underestimated in the official numbers (Odone et al., 2020).

Taken together, people's current status, perceptions and expectations about the length of the emergency – all of which are influenced by the new, uncertain context created by the pandemic and the related media shared narratives – are expected to influence people's fertility intentions during the pandemic, net of past experiences and psychological predispositions. Personal family imaginaries related to the joy of parenthood are also expected to influence changes in fertility intentions, although they should be only marginally affected by the pandemic. Imaginaries do change during the life course, but since they usually incorporate a normative orientation toward the future, they are not likely to be modified in the short term (Kiley and Vaisey, 2020). The presence of family imaginaries and their influence on fertility intentions leads to our next hypothesis:

Hypothesis 3b. Individuals with a positive family imaginary are less negatively influenced by the pandemic, and are less likely to change their pre-pandemic childbearing plans.

For people who were not directly exposed to the health and economic consequences of the pandemic, the shared narratives spread by the media were the major sources of uncertainty. However, to effectively grasp the media effects, indicators of the media coverage of the pandemic, combined with measures of individuals' exposure to those specific media contents, would be needed. Moreover, even if all of the necessary information was available, causality would remain difficult to ascertain. For these reasons, we adopted an experimental approach in which respondents were exogenously exposed to different scenarios regarding the expected end of the pandemic, mimicking a news report. We then asked the respondents about their (renewed) fertility intentions, in light of the expected duration of the emergency. Using this approach, we both provide additional evidence on the importance of media shared narratives and reinforce the claims about the causal role of the shadow of the future in fertility intentions. This experiment allows us to test our last hypothesis:

Hypothesis 4. Exposure to a new shared narrative that the return to pre-pandemic conditions will take a long time negatively influences fertility intentions; whereas exposure to a new shared narrative that the return to pre-pandemic conditions will happen quickly positively influences fertility intentions.

To sum up, if fertility decisions have been negatively influenced by the pandemic, we hypothesize that this effect cannot be explained by the objective exposure to the pandemic's health and economic consequences alone (Hypotheses **H1a** and **H1b**). In a context of amplified uncertainty about the future, perceptions (Hypotheses **H2**), and, in particular, expectations and imaginaries, may gain the upper hand (Hypotheses **H3a** and **H3b**). Expectations about the length of the pandemic spread by the media, which are simulated through our experiment, may also have a specific influence on fertility intentions (Hypothesis **H4**).

This first application of the Narrative Framework to the empirical analysis of changes in fertility intentions during the pandemic is carried out by means of survey data that we collected during the lockdown in Italy. These data operationalize all of the elements included in Figure 1, but do not include personal narratives of the

future, which are more easily explored through qualitative interviewing. However, if relevant information regarding all of the elements involved is available in the survey data, it may be used as a proxy to grasp the effects of personal narratives (Vignoli et al., 2020b).

4 Data, variables and methods

4.1 Sampling and data collection

The data come from an online survey carried out between April 25 and May 1, 2020; that is, during the final week of the Italian lockdown. A well-known issue of online sampling is that of coverage bias, which may undermine the survey's ability to represent the target population. Indeed, online surveys can only reach people who are online, and who have agreed to become part of a panel and to participate in the specific survey (Duffy et al., 2005). These limitations notwithstanding, we had no real alternative to the use of this method of data collection. Given our aim to exploit the lockdown as an exogenous uncertainty shock, we needed to collect all the relevant information for a reasonably large sample size in a very short time period. Face-to-face interviewing was, of course, not an option during the lockdown. The sampling was carried out by the international survey company Lucid, which is well-known in academic circles for its high-quality and rigorous data collection (Coppock and McClellan, 2019), and we followed several strategies to ensure both data representativeness and quality.

First, given our focus on fertility intentions, we targeted Italian men and women aged 20–43 and 20–41, respectively, regardless of their living arrangements and partnership status. For Italians in this age group, the incidence of regular internet use is close to 90% (ISTAT, 2018). Second, based on data from ISTAT, we set quotas for gender, age and area of residence that reflected the characteristics of the target group. Given the heterogeneous impact of COVID-19 across Italian areas – i.e. northern regions were hit harder by the pandemic in terms of the numbers of infections and official deaths – we set quotas for provinces (NUTS-3) in the northern part of Italy (including the Marche region), and for regions (NUTS-2) in the central and southern parts of the country (including Sicily and Sardinia). Third, respondents who provided deliberately fatuous answers had their answers filtered out. We also discarded interviews that were shorter than three minutes; the average duration of the interviews in the final sample was approximately eight minutes. After eliminating a few respondents who were expecting a child in January and/or at the interview date, the final sample consists of 3,934 individuals.

4.2 Variables

Among the sociodemographic factors related to past experiences and psychological predispositions, we collected information on each respondent's level of risk aversion

(“Do you feel inclined to take risks or rather to avoid them?”), number of siblings, living arrangement (no partner, married, cohabiting, living apart together), number of children and educational attainment. These are standard predictors of fertility intentions that were largely unaffected by the pandemic context, at least in the short term. Descriptive statistics for all variables are shown in Table 1.

To assess the influence of the shadow-of-the-past elements of the Narrative Framework that may have been affected by the exogenous uncertainty shock of the pandemic, we asked the respondents about their exposure, either direct or indirect, to SARS-CoV-2, and about changes in their socioeconomic status. While the majority of the respondents in our sample reported no personal exposure (60%), 5% said they had either tested positive for the virus or had been put in isolation due to a suspected infection, 24% reported having a close relative or acquaintance who had tested positive, and 10% reported having a close relative or acquaintance who had been put in isolation due to a suspected infection. To capture the respondents’ socioeconomic status, we asked them several questions referring to both their pre-pandemic (January) and current circumstances: i.e. employment status (employed, not employed, student); for the employed, the level of qualification of the occupation (high or low, with the former including managerial, professional and technical occupations) and the professional status (employee or self-employed); and for employees, the presence and the type of job contract (permanent, temporary, irregular work). We merged all of the pre-pandemic information in a “labor market status” variable. To measure more directly the impact of the lockdown and government restrictions, we compared pre-pandemic and current information, and created three binary variables concerning changes in employment status, as the other dimensions of the labor market status were less likely to be influenced by the new pandemic context, at least in the short term. As shown in Table 1, 8% of respondents who were workers or students in January were not employed at the time of the interview. In addition, 13% of respondents who were employed in January reported being temporarily inactive, while 21% indicated that they had shifted to remote work. Finally, we measured respondents’ net monthly household income at the time of the interview. We asked each and exposure to the (social)categories, which were subsequently recoded as a continuous variable ranging from €300 to €5,000. The average in our sample was close to €2,000 (median of €1,800), with a substantial number of missing values (17%), which had been imputed with the median value (missing values are concentrated among the students and the not employed).⁴ According to ISTAT, the median net monthly household income in Italy in 2017 was approximately €2,100. Thus, considering the negative impact of the lockdown, our sample average appears

⁴ Based on ISTAT data (2018), approximately 89% of students under age 40 live with at least one parent, which suggests that parental income should be considered. For this reason, imputing missing cases with the median household income should not have important consequences for our results.

Table 1:
Descriptive statistics (N = 3,934)

	Mean	Std. Dev
<i>B. Past experiences and psychological predispositions</i>		
<i>Risk aversion (0–10)</i>	4.83	2.79
<i>Number of siblings (0–3+)</i>	1.22	0.84
<i>Living arrangement</i>		
No partner	.25	
Living Apart Together	.27	
Cohabiting	.16	
Legally married	.33	
<i>Number of children (0–2+)</i>	.42	.72
<i>Educational attainment</i>		
Lower-secondary	.12	
Upper-secondary	.47	
Tertiary	.41	
<i>C. Status</i>		
<i>Exposure to SARS-CoV-2</i>		
No exposure	.60	
Indirect (suspected)	.10	
Indirect (positive)	.24	
Direct (suspected or positive)	.05	
<i>Labor market status (January)</i>		
Permanent employment (low)	.29	
Permanent employment (high)	.07	
Temporary employment (low)	.13	
Temporary employment (high)	.05	
Irregular employment	.02	
Self-employed (low)	.05	
Self-employed (high)	.05	
Not employed	.18	
Student	.16	
<i>Labor market transitions due to the lockdown</i>		
Toward not employment (from all other statuses)	.08	
Toward temporary inactivity (from employment)	.13	
Toward smart work (from employment)	.21	
<i>Net monthly household income (in €)</i>	1940.51	967.22
Missing on income	.17	

Continued

Table 1:
Continued

	Mean	Std. Dev
A. Media shared narratives		
<i>Media exposure (politics and latest news)</i>		
Hours of TV (January)	.93	1.01
Diff. in hours of TV (Now-January)	.67	1.15
Hours of internet (January)	1	1.09
Diff. in hours of internet (Now-January)	.61	1.03
D. Perceptions (insecurity due to)		
<i>Own work (0–10)</i>	5.90	3.09
<i>Own health (0–10)</i>	3.95	2.31
<i>Diffusion of the pandemic (0–10)</i>	6.87	2.50
<i>General economic situation (0–10)</i>	6.39	2.57
<i>General political situation (0–10)</i>	6.98	2.50
E. Expectations		
<i>Before the return to pre-pandemic condition (own)</i>		
My condition did not change	.07	
3 months	.12	
6 months	.25	
12 months	.39	
2 years	.12	
More than 2 years	.05	
<i>Before the return to pre-pandemic condition (Italy)</i>		
3 months	.03	
6 months	.08	
12 months	.25	
2 years	.28	
More than 2 years	.36	
F. Imaginaries		
<i>How much would having a(nother) child make you happy? (0–10)</i>	5.89	3.74
I. Fertility intentions in the next 3 years		
<i>In January, were you planning to have a child? (0–10)</i>	3.29	3.78
<i>Today, do you plan to have a child? (0–10)</i>	3.21	3.62
Δ Fertility_intentions _{t1-t}	-0.08	2.19

to be in line with the “true” population average, notwithstanding the high number of missing values.

While each respondent’s objective status was likely influenced by the pandemic-related health and socioeconomic consequences and government restrictions, his/her

perceptions and shadow-of-the-future elements were likely influenced by media shared narratives as well. To grasp the effects of these narratives, we asked respondents about how much time they spent each day watching TV and surfing the internet to get information about politics and the latest news. To isolate possible changes during the lockdown, we measured media exposure in January and at the time of the interview. While the respondents spent, on average, one hour per day watching TV and surfing the internet in January, their use of both types of media had increased by approximately 40 minutes per day during the lockdown.

To capture perceptions, we measured the respondents' feelings of insecurity due to their work, health, the diffusion of the pandemic and the general economic and political conditions, on a scale from zero to 10. On average, the respondents reported that they were not too worried about their health status (3.95), but they expressed a high level of insecurity because of the pandemic (6.87), and, potentially, because of its negative effects on their work (5.90) and on the general economic (6.39) and political (6.89) conditions.

To capture the shadow of the future, the role of pandemic uncertainty in expectations was measured through two questions regarding the expected length of time before the pre-pandemic conditions would return, with respect to the respondent's own situation and the country's social and economic conditions. The respondents indicated that they were much more pessimistic about the state of the country than about their own situation. While more than half of the respondents said that it would take at least two years for the pre-pandemic conditions to return throughout the country, a large majority of respondents said that they expected their own situation to return to normal within one year. However, 17% of respondents indicated that they expected that their own situation would not to return to normal for at least two years.

Exploring individuals' family imaginaries through online survey questions is complicated by social desirability and cognitive dissonance biases, as well as by the fact that imaginaries may differ depending on the stage of the life course, such as before and after the birth of the first child (Vignoli et al., 2020b). Following the literature on expected happiness (Billari, 2009) and affective forecasts (Wilson and Gilbert, 2003), we asked the respondents how much having a(nother) child would make them happy, on a scale from zero to 10. *Ceteris paribus*, higher values on this variable can be interpreted as the ultimate outcome of a positive family imaginary.

Finally, following recommendations to measure individual differences in psychological constructs with acceptable levels of precision (MacCallum et al., 2002), we asked the respondents to report their fertility intentions in the following three years, on a scale from zero ("definitely not") to 10 ("definitely yes"), both before (in January) and after the start of the pandemic (at the time of the interview). As shown in Table 1, the average values of the answers to the two questions – 3.29 and 3.21, respectively – point to only a minor reduction in fertility intentions. Thus, these descriptive statistics do not suggest that there was a substantial and generalized drop

in pre-pandemic fertility intentions during the lockdown. However, three factors should be taken into account when interpreting these results. First, responses to retrospective questions about fertility intentions may be adjusted *ex post* to accord with current intentions, and they may be affected by recall bias; although the short time window (3/4 months) should limit this risk. Second, temporary postponements of reproductive plans may not be captured in our results, as we asked about fertility intentions in the following three years, which likely include a post-pandemic period. Third, and most important, 41% of the sample answered zero (“definitely not”) to questions on fertility intentions both in January and at the time of the interview, which means that, regardless of the abovementioned measurement issues, for a substantial share of the respondents there simply was no room to observe a decline in fertility intentions due to the pandemic. Considering only individuals with non-zero intentions in January ($N = 2,068$), the average fertility intention in January was 6.25, and had declined to 5.56 at the time of the interview, with 34% of the respondents reporting lower intentions, and just 15% reporting higher intentions at the time of the interview. Irrespective of the actual magnitude of the absolute decline in fertility intentions, our aim is to understand which individual characteristics are associated with a decline (or an increase) in fertility intentions after the onset of the pandemic.

4.3 The experimental design

The survey included an experiment that presented the respondents with a mock news bulletin concerning the expected end of the pandemic emergency, according to a task force made up of leading coronavirus experts in Italy. We opted for this treatment because a few days before data collection the Italian prime minister had announced the formation of a task force of academics and other prominent experts to address the COVID-19 emergency, and to provide guidelines for the return to normality; thus, the treatment should have sounded realistic. Respondents were randomly assigned one of five treatments, each presenting a different expected duration before the return to normality: three months, six months, one year, two years, or more than two years. As a check for the validity of the treatment, respondents were asked which type of scenario they were exposed to. The percentage of respondents who could not recall the exact expected length of the pandemic included in the scenario accounted for 13% in our analytical sample, but dropped to approximately 5% if we excluded people who confused “more than two years” with “two years.” After being exposed to the treatment, respondents were asked about their fertility intentions in the next three years in light of the expected duration of the emergency. Finally, the respondents were informed of the fictitious nature of the information about the evolution of the pandemic they had received. The experimental protocol received formal approval from the Ethical Committee of the University of Florence. The full text of the treatment is reported in Appendix A.

4.4 Methods

The analytical strategy is twofold. For the analysis of changes in fertility intentions due to the pandemic, we implemented the following stepwise OLS regression models:

$$M1: \Delta Fertility_{t1-t} = Status + Past + Fertility_t$$

$$M2: \Delta Fertility_{t1-t} = Perceptions + Media\ shared\ narratives + M1$$

$$M3: \Delta Fertility_{t1-t} = Imaginaries + Expectations + M2$$

Where $\Delta Fertility_{t1-t}$ is the difference between fertility intentions at the interview and fertility intentions in January ($Fertility_t$), with the latter being included in all models together with basic sociodemographic variables and risk aversion (*Past*). All elements of the stylized equations include the related variables, as shown in Table 1. Model 1 only adds individuals' objective socioeconomic status and direct and indirect exposure to SARS-CoV-2, thus allowing us to test Hypotheses **H1a** and **H1b**. Models 2 and 3 cumulatively add additional variables to test whether perceptions, including perceptions influenced by media shared narratives (Hypothesis **H2**), expectations and imaginaries (Hypotheses **H3a** and **H3b**), exert an additional influence on changes in fertility intentions. As a robustness check, Model 3 is also estimated on a subsample of respondents with non-zero fertility intentions in January. Finally, to disentangle the different mechanisms that potentially underlie declines and increases in fertility intentions during the lockdown, and to offer a different evaluation of our effect sizes, Model 3 is also estimated through a multinomial logistic regression analyzing the probability of fertility intentions decreasing, increasing or remaining the same as in January.

In a second step, we analyzed the causal impact of a new shared narrative of the future (Hypothesis **H4**) by means of our survey experiment. We compared respondents' post-treatment and pre-treatment fertility intentions by means of the following OLS regression model:

$$M4: \Delta Fertility_{t2-t1} = Treatment + Recall + Fertility_{t1}$$

Where $\Delta Fertility_{t2-t1}$ is the difference between post- and pre-treatment fertility intentions ($Fertility_{t1}$). *Treatment* represents a set of dummies for the different scenarios, with the "three months" scenario as the reference category. *Recall* is a dummy variable taking a value of one for the respondents who were not able to recall exactly which type of scenario they have been exposed to. In order to check for the exogeneity of our treatment, Model 4 has also been estimated with the addition of all variables included in Model 3 of the previous analytical step. To provide additional insights, we performed an analysis of possible heterogeneity in treatment effects.

5 Results

5.1 Determinants of changes in fertility intentions during the lockdown

Table 2 presents the results of our stepwise OLS models, with the exclusion of coefficients related to basic sociodemographic factors, past experiences and psychological predispositions (*Past*) not directly affected by the pandemic and government restrictions. Model 1 shows that individuals' adaptations of their fertility intentions after the pandemic outbreak were moderated by their labor market status in January: the respondents who were temporarily employed in a low-skilled occupation or in the underground economy, or who were not employed, had lower fertility intentions than low-skilled employees with a permanent contract. Similar patterns can be observed for the highly skilled self-employed and students. However, the effects of variables that capture the impact of the lockdown more directly were virtually null. Neither a (temporary) job loss, a transition to remote work after the start of the pandemic, the degree of exposure to the virus nor household income was associated with changes in fertility intentions. Indeed, having tested positive for the virus was even associated with higher post-pandemic fertility intentions, especially compared to an indirect experience (we will come back to this point later on). Thus, the empirical evidence provides very limited support for Hypotheses **H1a** and **H1b**. Moreover, as the stepwise inclusion of perceptions and shadow-of-the-future factors further reduced the impact of labor market status in January, the only shadow-of-the-past factors that had a *direct* effect on changes in fertility intentions (Model 3) were those of being a student and a highly skilled self-employed individual.

Model 2 includes perceptions, and shows that individuals' levels of insecurity concerning their own health and work, as well as the general economic situation, were significantly associated with a contraction in fertility intentions; whereas their levels of insecurity concerning the political situation and the pandemic were not. Thus, the results are partially in line with our Hypothesis **H2**, as insecurity concerning the pandemic was not directly associated with fertility intentions once insecurity concerning the respondent's personal situation was accounted for. The effects of the statistically significant variables were not trivial: on the 0–10 scale, the regression coefficients indicate that the most insecure respondents reported an approximately half-point decrease in fertility intentions. Interestingly, in this model, the effects of the respondent's labor market status in January turned non-significant. This result suggests that perceptions mediated the (limited) influence of objective socioeconomic factors on post-pandemic changes in fertility intentions. Model 2 also includes the variable for media exposure, which suggests that the respondents who increased their TV consumption during the lockdown adjusted their fertility intentions downward, although the coefficient was statistically significant only in Model 3. Notwithstanding the abovementioned difficulties involved in capturing

their (causal) effects with such a rough measure, this result provides a first indication of the role of media-channeled shared narratives.

Model 3 adds our two measures of expectations concerning the evolution of the pandemic, and our proxy of the imaginary associated with childbearing. In line with our Hypothesis **H3a**, expectations about the length of time before the respondent's own personal situation would return to pre-pandemic conditions were negatively associated with post-pandemic fertility intentions, but were statistically

Table 2:
Determinants of changes in fertility intentions after the lockdown. OLS models

	M1		M2		M3	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
C. Status						
<i>Labor status in January (ref. Permanent-low)</i>						
Permanent-high	0.016	(0.145)	0.025	(0.143)	0.010	(0.134)
Temporary-low	-0.257**	(0.122)	-0.170	(0.121)	-0.191	(0.116)
Temporary-high	-0.150	(0.183)	-0.069	(0.183)	-0.087	(0.176)
Black job	-0.525*	(0.270)	-0.399	(0.268)	-0.359	(0.263)
Self-low	-0.187	(0.180)	-0.108	(0.180)	-0.042	(0.171)
Self-high	-0.373**	(0.162)	-0.304*	(0.161)	-0.290*	(0.153)
Not employed	-0.223*	(0.117)	-0.016	(0.121)	0.005	(0.118)
Student	-0.550***	(0.126)	-0.479***	(0.127)	-0.393***	(0.124)
<i>HH income (I€)</i>	5.53e-05	(3.46e-05)	7.20e-06	(3.45e-05)	1.30e-05	(3.36e-05)
<i>Labor market transitions due to the lockdown</i>						
To not emp.	-0.002	(0.152)	0.168	(0.152)	0.171	(0.147)
Temp. not emp.	-0.054	(0.109)	0.078	(0.109)	0.055	(0.104)
To smart work	0.069	(0.099)	0.050	(0.097)	0.090	(0.094)
<i>Exposure to SARS-CoV-2 (ref. No exposure)</i>						
Indirect (susp.)	-0.105	(0.100)	-0.077	(0.098)	-0.131	(0.095)
Indirect (pos.)	0.050	(0.079)	0.093	(0.079)	0.071	(0.077)
Direct	0.215	(0.154)	0.222	(0.156)	0.228	(0.149)
A. Media shared narratives						
<i>Media exposure (politics and latest news)</i>						
TV hours (Jan.)			0.035	(0.043)	0.026	(0.042)
TV hours (Today-Jan.)			-0.063	(0.044)	-0.083**	(0.042)
Web hours (Jan.)			0.055	(0.039)	0.068*	(0.038)
Web hours (Today-Jan.)			-0.013	(0.049)	-0.021	(0.047)
D. Perceptions (insecurity due to)						
<i>Own health</i>			-0.047***	(0.016)	-0.034**	(0.016)
<i>Own work</i>			-0.046***	(0.014)	-0.036***	(0.014)
<i>General economic situation</i>			-0.059***	(0.018)	-0.044**	(0.017)
<i>General political situation</i>			-0.011	(0.017)	-0.011	(0.017)
<i>Diffusion of the pandemic</i>			-0.001	(0.017)	-0.009	(0.017)

Continued

Table 2:
Continued

	M1		M2		M3	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
E. Expectations						
<i>Return to pre-pandemic own condition (ref. It did not change)</i>						
3 months					-0.010	(0.139)
6 months					-0.044	(0.120)
12 months					-0.130	(0.114)
2 years					-0.178	(0.142)
More than 2 years					-0.686***	(0.196)
<i>Return to pre-pandemic condition in Italy (ref. 3 months)</i>						
6 months					0.191	(0.238)
12 months					0.139	(0.216)
2 years					-0.014	(0.219)
More than 2 years					0.057	(0.218)
F. Imaginaries						
<i>Happiness from childbirth</i>						
Constant	0.624***	(0.174)	1.588***	(0.231)	0.881***	(0.298)
Observations	3,934		3,934		3,934	
R-squared	0.162		0.184		0.247	

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for fertility intentions in January, risk aversion, number of children, siblings, education, area of residence, sex, age and age².

significant only for the most pessimistic forecasts.⁵ Interestingly, expectations about the general situation in Italy did not exert any direct effects once expectations concerning the respondent's personal situation were controlled for. The variable for the expected level of happiness from having a(nother) child exerted both a statistically and substantively significant positive effect, while also contributing to a substantial rise in the model's R-squared. That is, respondents with a more positive imaginary related to childbearing had been less negatively influenced by the lockdown, and had higher post-pandemic fertility intentions, in line with our Hypothesis **H3b**.⁶

All in all, the results of Model 3 suggest that the most relevant individual characteristics needed to understand fertility decision-making under conditions of

⁵ Results do not change if the family imaginary is not simultaneously included in the model.

⁶ Additional analyses revealed that the effect of the expected level of happiness from having a(nother) child is larger for individuals with zero or only one child (0.19 and 0.21, respectively), whereas it is substantially smaller for individuals with at least two children (0.10), signaling lower perceived gains from higher-order childbirths.

COVID-induced uncertainty were perceptions and the shadow of the future, whereas objective measures of the respondents' socioeconomic situations and exposure to SARS-CoV-2 did not play a significant role.⁷ Notwithstanding an obvious increase in the uncertainty surrounding our estimates, this overall conclusion held even after implementing separate models by sex. This is not to say, however, that the shadow of the past was not at all relevant. Age, sex, the number of children and the area of residence were significantly associated with changes in fertility intentions: i.e. childless women, people living in southern regions, and people in their mid-thirties had higher post-pandemic intentions.⁸

In Table B.1 in Appendix B, Model 3 was implemented selecting only individuals with non-zero fertility intentions in January, before the onset of the pandemic in Italy. The most important changes to highlight are the substantial increases in the magnitude of the coefficients associated with media exposure, expectations and imaginary. This is not surprising, as the individuals who had at least some positive fertility intentions were those who were more likely to have been negatively affected by the sudden uncertainty shock, and for whom the media coverage of the pandemic and pessimistic expectations about the future would have been particularly salient. On the other hand, people with a more positive family imaginary were expected not only to keep their higher pre-pandemic fertility intentions, but also potentially to increase their fertility intentions as they aimed for their imagined goal, regardless of their COVID-induced uncertainty.

Table 3 provides additional insights by distinguishing between the effects of covariates on the probability of decreasing or increasing fertility intentions during the lockdown, through a multinomial logistic regression implemented on the whole sample. Consistent with our arguments, the respondents' perceptions of insecurity concerning their own health and work were associated with a higher relative risk of having reduced fertility intentions during the lockdown, whereas their perceptions of insecurity about the general economic situation reduced the relative risk of increasing vs. holding the same fertility intentions. The respondents' expectations about their personal situation were strongly, positively and monotonically associated only with the relative risk of decreasing vs. holding the same fertility intentions. The predicted probabilities calculated after the multinomial logistic regression indicate that those respondents who thought that it would take more than two years for their personal situation to return to pre-pandemic conditions had a 25% probability of having decreased their fertility intentions, compared to 10% for those who did not perceive any changes. For the increasing fertility outcome, the differences in the predicted probabilities were, by contrast, small and statistically insignificant.

⁷ We checked that the model does not suffer from major multicollinearity issues, as the mean variance inflation factor (VIF), as well as the single VIFs associated with each regression coefficient of Model 3, are lower than 2.5.

⁸ Full models are available from the authors upon request.

Conversely, and as expected, a more positive family imaginary was associated with both lower risks of having decreased fertility intentions and higher risks of having increased fertility intentions, with the latter effect being stronger than the former: i.e. a one-point increase in the expected happiness from childbirth was associated with a lower predicted probability of having decreased fertility intentions of

Table 3:
Determinants of changes in fertility intentions after the lockdown. Multinomial logit model

	Decrease vs. Same		Increase vs. Same	
	RRR	Std. Err.	RRR	Std. Err.
C. Status				
<i>Labor status in January (ref. Permanent-low)</i>				
Permanent-high	1.009	(0.215)	0.971	(0.200)
Temporary-low	1.380*	(0.235)	1.183	(0.199)
Temporary-high	0.772	(0.204)	0.756	(0.200)
Black job	0.876	(0.303)	1.009	(0.389)
Self-low	1.079	(0.239)	0.984	(0.230)
Self-high	1.113	(0.261)	0.520**	(0.157)
Not employed	0.717*	(0.131)	0.959	(0.173)
Student	0.803	(0.176)	0.457***	(0.105)
<i>HH income (1€)</i>	0.999**	(5.99e-05)	0.999**	(5.88e-05)
<i>Labor market transitions due to the lockdown</i>				
To not emp.	0.862	(0.175)	1.045	(0.219)
Temp. not emp.	0.963	(0.148)	1.054	(0.172)
To smart work	1.086	(0.153)	1.134	(0.162)
<i>Exposure to SARS-CoV-2 (ref. No exposure)</i>				
Indirect (suspected)	1.052	(0.168)	0.730*	(0.132)
Indirect (positive)	1.029	(0.126)	0.966	(0.122)
Direct	1.220	(0.280)	1.692**	(0.364)
A. Media shared narratives				
<i>Media exposure (politics and latest news)</i>				
TV hours (Jan.)	1.062	(0.070)	1.149**	(0.066)
TV hours (Today-Jan.)	1.108**	(0.058)	1.011	(0.058)
Web hours (Jan.)	1.027	(0.060)	1.118**	(0.060)
Web hours (Today-Jan.)	1.180***	(0.072)	1.117*	(0.070)
D. Perceptions (insecurity due to)				
<i>Own health</i>	1.090***	(0.025)	1.015	(0.025)
<i>Own work</i>	1.112***	(0.026)	1.042*	(0.023)
<i>General economic situation</i>	1.022	(0.029)	0.938**	(0.025)
<i>General political situation</i>	0.999	(0.025)	0.999	(0.026)
<i>Diffusion of the pandemic</i>	1.000	(0.023)	0.963	(0.023)

Continued

Table 3:
Continued

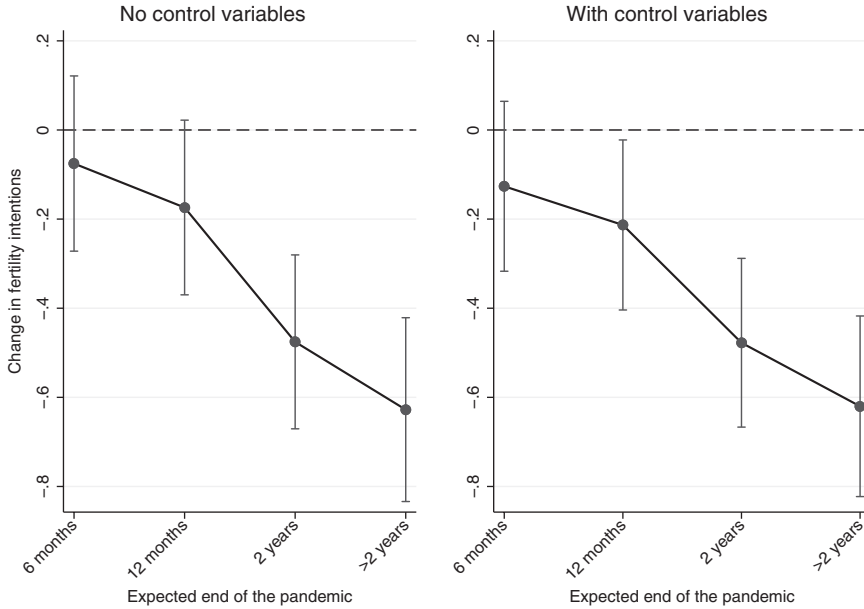
	Decrease vs. Same		Increase vs. Same	
	RRR	Std. Err.	RRR	Std. Err.
E. Expectations				
<i>Return to pre-pandemic own condition (ref. It did not change)</i>				
3 months	1.463	(0.455)	1.138	(0.292)
6 months	2.091***	(0.582)	1.325	(0.299)
12 months	2.530***	(0.677)	1.477*	(0.321)
2 years	2.877***	(0.832)	1.211	(0.310)
More than 2 years	3.768***	(1.231)	0.846	(0.322)
<i>Return to pre-pandemic condition in Italy (ref. 3 months)</i>				
6 months	1.052	(0.383)	1.156	(0.378)
12 months	1.046	(0.350)	0.842	(0.259)
2 years	1.112	(0.376)	0.726	(0.229)
More than 2 years	0.827	(0.281)	0.671	(0.213)
F. Imaginaries				
<i>Expected happiness from child</i>				
Constant	0.927***	(0.020)	1.278***	(0.020)
	0.012***	(0.006)	0.085***	(0.041)
Observations	3,934			
Pseudo R-squared	0.191			

Notes: Relative risk ratios, with robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for fertility intentions in January, risk aversion, number of children, siblings, education, area of residence, sex, age and age².

1.3 percentage points, and a higher predicted probability of having increased fertility intentions of 2.7 percentage points. Contrary to our predictions, but in line with the results of Table 2, the model also showed a positive effect of having had direct experience with SARS-CoV-2 on the risk of increasing fertility intentions, whereas the respondents who had only indirect experience of relatives or acquaintances with a suspected infection had a lower risk of increasing fertility intentions than those with no exposure at all. This result held across different model specifications, irrespective of the number of additional variables included. A tentative explanation for this finding is that for respondents who had close acquaintances or relatives who were put in isolation, COVID-19 was an unknown threat casting a shadow over their future; whereas those respondents who actually tested positive, and likely had low to moderate symptoms given their young age, looked to the future with more optimism, possibly also due to their acquired immunity.⁹

⁹ It is worth mentioning that during the early stages of the pandemic, there was a widespread belief, fostered by media reports, that young people are very unlikely to get infected, and if so, that they only get cold-like symptoms.

Figure 2:
Changes in fertility intentions after the treatment, by different scenarios regarding the expected end of the pandemic (“3 months” is the reference scenario). OLS models without (left panel) and with (right panel) additional control variables



Notes: Both models control for fertility intentions at the time of the interview and the Recall dummy for respondents who could not recall the exact expected length of the pandemic included in the scenario.

5.2 The causal impact of a new shared narrative of the future

Figure 2 shows the results of our experiment: that is, post-treatment changes in respondents' fertility intentions based on the type of scenario they were exposed to. The left panel plots regression coefficients associated with the different scenarios from an OLS model specified as in Model 4. The dotted zero line represents the reference scenario of a predicted return to normality for Italy within three months. The respondents who were exposed to scenarios in which a return to normality would not occur for at least two years significantly reduced their post-treatment fertility intentions: the intensity of the reduction was of approximately 0.6 points for the more pessimistic scenario, compared to the reference scenario.¹⁰ The right panel shows that the coefficients were virtually identical after the inclusion of a long list

¹⁰ Results remain virtually identical with the exclusion of respondents who could not recall the exact scenario they have been exposed to (a value of one on the Recall dummy).

of controls (all the variables included in Model 3 of Table 2), apart from the slightly smaller confidence intervals. These findings reinforce the causal interpretation of the results, and confirm that the treatment was, indeed, exogenous.

In addition, thanks to the robustness of the main findings and the simplicity of the model, we explored possible heterogeneity in treatment effects, first through combinations of sex and area of residence. These additional models (available from the authors upon request) produced very similar patterns to those of Figure 2 across all combinations, although the treatment effects were somewhat stronger in central and southern Italy, whereas the differences by sex were neither statistically nor substantially significant. The regression coefficients associated with the “more than two years” scenario were $-.45$ ($p = 0.014$) and $-.56$ ($p = 0.002$) among women and men in the northern regions, and $-.97$ ($p = 0.001$) and $-.78$ ($p = 0.001$) among their counterparts in the central and southern regions. A potential explanation for these differences is that in the northern regions, which were more severely affected by the pandemic, the pre-treatment expectations about the return to normality were already more pessimistic. Indeed, our data indicate that 39% of the northerners, compared to 30% of the southerners, thought that conditions would not return to normal for more than two years.

More generally, it seems plausible for the treatment to have had stronger negative effects among the respondents who had more optimistic expectations and who were exposed to more pessimistic scenarios. We analyzed different treatment effects by the respondents’ pre-treatment expectations about the length of time it would take for Italy to return to pre-pandemic conditions, distinguishing between those respondents who expected it to occur within 12 months, two years, and more than two years (the modal category, see Table 1). The regression coefficients associated with the “more than two years” scenario were $-.35$ ($p = 0.031$), $-.64$ ($p = 0.000$) and $-.92$ ($p = 0.000$), respectively.

6 Discussion

In this article, we argued that the explanation for individual decision-making in conditions of uncertainty – especially for long-term, binding decisions, such as fertility decisions – needs to provide a complex account of different temporal orientations. While the sociological and demographic literatures have widely demonstrated that fertility decisions are shaped by individuals’ previous life experiences and socioeconomic status – which we refer to as the “shadow of the past” – rising uncertainty about the future necessitates an analytical framework that explicitly acknowledges its forward-looking nature. Building on recent developments from economic sociology (Beckert, 2016; Beckert and Bronk, 2018), we relied on the Narrative Framework (Vignoli et al., 2020a, 2020b), which argues that personal narratives of the future, and their constitutive elements of expectations and imaginaries – which we refer to as the “shadow of the future” – represent crucial drivers for decision-making under conditions of uncertainty. Personal narratives of the

future are not merely the result of psychological predispositions or idiosyncratic preferences, but are socially constructed in that they are shaped by “shared narratives” in the form of public images produced by the media and other powerful opinion formers.

We exploited the exogenous shock provided by the COVID-19 pandemic as a crucial occasion to test empirically some of the predictions of the Narrative Framework, without having any explicit aim to operationalize the whole theoretical schema. We argued that narratives of the future have become particularly important for fertility decision-making in contemporary societies, but also that the recent COVID-19 pandemic represented an enormous uncertainty shock that could have made the role of the shadow of the future particularly salient, over and above the effects of the shadow of the past. For instance, even scientists found it difficult to forecast the length and the consequences of the pandemic. Meanwhile, people needed to cope with leading a different daily life; form their own expectations about when conditions would return to “normal;” and, on that basis, formulate their life plans, including about family formation. Government restrictions that were imposed following the start of the pandemic may not have negatively influenced people’s intentions to have a(nother) child if they anticipated a rapid return to pre-pandemic conditions, whereas these restrictions might have inhibited fertility if people had a darker view, and thus expected uncertainty to persist, irrespective of their current socioeconomic status and perceptions of it. At the same time, in such an unprecedented situation, in which expectations could not be based on any firm grounds, imaginaries may have played an additional, independent role.

Using unique data collected during the spring 2020 lockdown in Italy, the first Western country to experience widespread diffusion of the SARS-CoV-2 virus, we showed that objective indicators of individuals’ exposure to the health and economic consequences of the pandemic played a very limited role in re-shaping individuals’ fertility plans during the lockdown. This is not to say that the shadow of the past was not at all relevant: traditional predictors, such as age, sex, the number of children and the area of residence were significantly associated with changes in fertility intentions. However, people’s subjective perceptions, also supported by media-channeled shared narratives, and especially their expectations and imaginaries, were found to be crucial moderators of their adaptation to a new context characterized by overwhelming uncertainty. Hence, taking the shadow of the future into account is a more effective way to understand the mechanisms through which the pandemic affected fertility intentions than simply measuring people’s objective exposure to the virus and its related socioeconomic consequences. Our results suggest that when respondents expected that it would take a long time for their pre-pandemic life to return to normal, their pre-pandemic fertility intentions were reduced.

Importantly, having a higher level of expected happiness from childbirth, which is a proxy for a positive family imaginary, not only helped respondents to remain faithful to their plans, it even encouraged them to increase their fertility intentions, COVID-induced uncertainty notwithstanding. Even if Italy, like other Western

countries (Sobotka et al., 2021), is already showing the first signs of fertility decline, our results suggest that a homogenous reaction in terms of a downward revision of childbearing plans is unlikely as well. In a situation in which rational decision-making was rendered difficult by mounting uncertainty about the future state of the world, those individuals who strongly valued parenthood may have reconsidered their life goals in favor of plans to form a family.

The claim that narratives of the future play a causal role has been reinforced by our experimental analysis, through which we were able to assess the causal impact of a shared narrative of the future on fertility intentions. Indeed, respondents were randomly exposed to different future scenarios regarding the expected length of the pandemic, and we found their pre-treatment fertility intentions decreased monotonically as the expected length of the pandemic increased. Both experimental and survey data converge in supporting the hypothesis that the shadow of the future had a clear impact on shaping fertility intentions during the pandemic emergency.

Of course, our work is not without limitations. First, the retrospective analysis of intentions may be influenced by the reduction of cognitive dissonance between current and pre-pandemic fertility intentions. While the use of panel data would, of course, have been preferable, the exceptional and unexpected situation of the pandemic did not allow us to plan pre- and post-pandemic waves of a panel survey. Second, even if the Narrative Framework is built on top of the established pragmatist tradition, which has recently been reappraised by Beckett and colleagues, its operationalization within a survey is a novelty. While there are well-known and validated indicators available in the literature for “traditional” variables related to past experiences and psychological predispositions, status, and perceptions; for expectations, and especially for imaginaries, there are just a few examples of their operationalization (Vignoli et al., 2020b). For imaginaries, we relied on the literature on the “expected happiness” (Billari, 2009); however, the common finding that couples are already happier before the birth of a child (see, e.g. Myrskylä and Margolis, 2014) may be attributable to more than the perception of an increase in happiness from the arrival of a future child – e.g. it may be the result of having a happy relationship and high life satisfaction, which are positively associated with fertility (Mencarini et al., 2018). A more in-depth exploration of personal imaginaries of parenthood, together with their relationship to childbearing desires (Mynarska and Rytel, 2018, 2020), should be developed in future research. In addition, future studies should attempt to capture more directly the role of personal narratives of the future and their functions in the fertility decision-making process through the use of both quantitative and qualitative methods.

In this paper, we showed that when studying changes in fertility intentions after the onset of a pandemic, it is important to take shadow-of-the-future factors into account. However, our conclusion that the shadow of the past is substantially less relevant than the shadow of the future for understanding the adaptation of the fertility decision-making process in a situation of increasing uncertainty may be traced back, at least in part, to the fact that our empirical analyses focused

on the short-term effects of an unprecedented uncertainty shock. It is possible that long-lasting economic hardship due to subsequent waves of the pandemic and the responses to it may become increasingly important, and thus influence potential reductions in fertility. In addition, the shadow of the past already played an important role in shaping pre-pandemic fertility intentions. However, we argue that our results are suggestive of the factors that drive fertility decision-making in contemporary societies, even beyond the pandemic emergency. Long-term societal changes driven by globalization, and the “harsh new world of economic insecurity” (Hacker, 2019, p. xvi) that have accompanied them, are likely to have made narratives of the future more salient for fertility decisions in contemporary Western societies, in part due to the increasing pervasiveness of the media coverage of the economy. The Great Recession, for instance, fueled general perceptions of uncertainty about future economic conditions that may have hampered fertility even in countries and social groups that were only marginally affected by mass lay-offs or company bankruptcies (Sobotka et al., 2021; Hofmann et al., 2017). Preliminary empirical evidence corroborating this argument has been provided for the US, where it has been shown that fertility rates at the state level have been influenced by unemployment rates at the national level, and the press coverage of the economy, net of state-level economic conditions (Schneider, 2015). Future research should clarify whether the spreading of narratives of an uncertain future is responsible for the homogeneous decline in fertility that the US and European countries have been facing since 2010.

Acknowledgements

The members of the University of Florence Population and Society Unit (UPS), in particular Bruno Arpino and Gustavo De Santis, are gratefully acknowledged for their useful comments on a preliminary version of the study. The Editors and Reviewers of the Vienna Yearbook of Population Research also offered insightful suggestions. This work was supported by the Italian Ministry of University and Research under the FARE grant ‘Narratives’ (PI: Daniele Vignoli).

ORCID

Raffaele Guetto  <https://orcid.org/0000-0001-8052-9809>

Giacomo Bazzani  <https://orcid.org/0000-0003-0312-8221>

Daniele Vignoli  <https://orcid.org/0000-0003-1227-5880>

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Appendix A. Wording of the treatment

In the next screen we will provide you with up-to-date forecasts concerning the evolution of the coronavirus pandemic.

Within the last few days there haven't been substantial variations in the number of infections, hospitalizations and deaths. The task force composed of leading experts on the coronavirus pandemic eventually obtained reliable predictions about the future of the pandemic in Italy.

The experts predict that the coronavirus pandemic emergency will last **X** before a return to normality.

(5 randomized scenarios for **X**: 3 months, 6 months, 12 months, 2 years, more than 2 years.)

Appendix B. Determinants of changes in fertility intentions after the lockdown

Table B.1:
Determinants of changes in fertility intentions after the lockdown, only individuals with non-zero fertility intentions in January. OLS models

	Coeff.	Std.Err
C. Status		
<i>Labor status in January (ref. Permanent-low)</i>		
Permanent-high	-0.078	(0.175)
Temporary-low	-0.296*	(0.157)
Temporary-high	0.052	(0.222)
Black job	-0.144	(0.400)
Self-low	-0.221	(0.248)
Self-high	-0.470**	(0.190)
Not employed	0.097	(0.179)
Student	-0.266	(0.192)
<i>HH income (1€)</i>	1.27e-04**	(5.00e-05)
<i>Labor market transitions due to the lockdown</i>		
To not emp.	0.249	(0.209)
Temp. not emp.	0.139	(0.141)
To smart work	-0.013	(0.122)
<i>Exposure to SARS-CoV-2 (ref. No exposure)</i>		
Indirect (suspected)	-0.071	(0.137)
Indirect (positive)	0.148	(0.111)
Direct	0.261	(0.204)
A. Media shared narratives		
<i>Media exposure (politics and latest news)</i>		
TV hours (Jan.)	0.025	(0.063)
TV hours (Today-Jan.)	-0.136**	(0.060)
Web hours (Jan.)	0.093	(0.059)
Web hours (Today-Jan.)	-0.088	(0.065)
D. Perceptions (insecurity due to)		
<i>Own health</i>	-0.044	(0.027)
<i>Own work</i>	-0.084***	(0.024)
<i>General economic situation</i>	-0.033	(0.028)
<i>General political situation</i>	-0.046*	(0.026)
<i>Diffusion of the pandemic</i>	-0.010	(0.027)

Continued

Table B.1:
Continued

	Coeff.	Std.Err
<i>E. Expectations</i>		
<i>Return to pre-pandemic own condition (ref. It did not change)</i>		
3 months	-0.122	(0.213)
6 months	-0.271	(0.181)
12 months	-0.367**	(0.173)
2 years	-0.564***	(0.204)
More than 2 years	-1.144***	(0.329)
<i>Return to pre-pandemic condition in Italy (ref. 3 months)</i>		
6 months	0.144	(0.397)
12 months	0.184	(0.377)
2 years	-0.108	(0.385)
More than 2 years	0.151	(0.385)
<i>F. Imaginaries</i>		
<i>Expected happiness from child</i>	0.255***	(0.024)
Constant	0.918*	(0.480)
Observations	2,068	
R-squared	0.227	

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Model controls for fertility intentions in January, risk aversion, number of children, siblings, education, area of residence, sex, age, and age².

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