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# Fertility intentions and outcomes
# Implementing the Theory of Planned Behavior with graphical models

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ABSTRACT

This paper studies fertility intentions and their outcomes, analyzing the complete path leading to fertility behavior according to the social psychological model of Theory Planned Behavior (TPB). We move beyond existing research using graphical models to have a precise understanding, and a formal description, of the developmental fertility decision-making process. Our findings yield new results for the Italian case which are empirically robust and theoretically coherent, adding important insights to the effectiveness of the TPB for fertility research. In line with TPB, all intentions' primary antecedents are found to be determinants of the level of fertility intentions, but do not affect fertility outcomes, being pre-filtered by fertility intentions. Nevertheless, in contrast with TPB, background factors are not fully mediated by intentions' primary antecedents, influencing directly fertility intentions and even fertility behaviors.



## 1. Introduction

The study of fertility intentions has become central in the discussion of fertility rates in developed countries, under the realistic assumption that, in an almost perfect contraceptive regime, having a child is a result of a reasoned, although imperfect, decision. Whereas fertility intentions have been a central theme in demographic research for some time, it has received renewed attention in recent years since intentions are now frequently analyzed in the framework of Theory Planned Behavior (hereafter, TPB), a general psychological theory concerning the link between attitudes and behavior (Ajzen, 1991, 2005; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2010). Billari, Philipov, and Testa (2009), as well as Ajzen and Klobas (2013), specifically discuss the possible application of TPB in the fertility domain. Fertility outcomes, according to TPB, are seen as depending directly on fertility intentions, which in turn depend directly on attitudes (related to the perceived benefits and/or costs of reproduction), subjective norms (related to the social approval of behavior from relevant others), and perceived behavioral control. Possible constraints can further intervene from the time the fertility intention was formed and the subsequent behavior (such as a disruption of the couple's relationship or changes in individuals' health conditions or job status). This multi-factor paradigm is expected to depend on several background factors as well (such as socioeconomic and demographic factors). Whether TPB is a valid framework for analyzing human fertility is, however, a hotly debated issue (Ajzen, 2011; Barber, 2011; Klobas, 2011; Liefbroer, 2011; Miller, 2011; Morgan & Bachrach, 2011; Philipov, 2011) and, apart from the theoretical debate, there are only few attempts to test the TPB

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framework in its full complexity (e.g., Dommermuth, Klobas, & Lappegård, 2013; Kuhnt & Trappe, 2013).

In this study, we aim to analyze the complete path leading to fertility behavior, within the explanatory framework of TPB and considering the most common background variables (i.e., determinants) of fertility. We move beyond existing research developing a unified empirical strategy to test the validity of TPB. Through graphical models, we provide a precise understanding, and a formal description, of the developmental fertility decision-making process by studying the dependencies among all the factors involved in the TPB, on the basis of their joint distribution. In our application, variables are partitioned into a sequence of blocks: we can distinguish between pure response variables (in the last block), pure background variables (in the first block), and intermediate variables, which are responses for variables in previous blocks and explanatory for the subsequent variables. The partial ordering among the variables into blocks is fully derived by the TPB. The method, while not materially different from more conventional ones, does provide a useful conceptual fit to the TPB and facilitate its evaluation.

Our study focuses on Italy, a country for which the use of TPB in fertility research is a novelty. We rely on a specific module questionnaire, within the 2003 Italian GGS survey, that was designed to collect the relevant dimensions of the TPB (Vikat et al., 2007). Then, using the 2007 follow-up of that survey, we look at the subsequent fertility behavior, thus completing the study of the whole process leading up to the decision to have a child.

## 2. Theoretical background on the study of fertility intentions and realizations

### *2.1. The Theory of Planned Behavior as a theoretical framework for the fertility decision-making process*

According to the TPB, which is an extension of the earlier Theory of Reasoned Action (Fishbein & Ajzen, 1975, 2010), intentions are the immediate antecedents of corresponding behavior. This hypothesis is supported by several systematic reviews of the empirical literature, and strong intention–behavior correlations are also observed in the fertility domain (Ajzen, 2010; Billari et al., 2009). As Ajzen and Klobas (2013) advocate, however, a concern in applying the TPB in the study of human fertility is defining an appropriate behavioral criterion. In fertility research, having a child, is commonly described as a behavior. However, strictly speaking, a child birth is an outcome of specific antecedent behaviors (e.g., having sex, not using a contraceptive, using artificial reproductive technology, etc.) that (may) result in a pregnancy. From this perspective, having a child is an outcome or behavioral goal, rather than a behavior, which might result in attainment of the goal. Central to this discussion is the implicit or explicit assumption that, at least in developed countries with readily available contraception, having a child is the result of a reasoned decision (e.g., Goldstein, Lutz, & Testa, 2004; Mills, Mencarini, Tanturri, & Begall, 2008; Testa & Grilli, 2006). In almost perfect contraceptive regimes, in fact, the difference between fertility as a behavior and fertility as a behavioral goal is as narrow as it can be. Of course, individuals have greater control over performance of a behavior than they have over attaining a goal the behavior is intended to produce.

Ajzen and Klobas (2013) describe how the TPB can be used to model fertility decision-making process: when people formulate their intentions to have a(nother) child, they rely on three conceptually distinct, but interrelated, primary antecedents of fertility intentions: attitudes, subjective norms, and perceived behavioral control. These antecedents represent the most important predictors of fertility intentions.

The "attitudes toward the behavior", which can be favorable or unfavorable, are "readily accessible or salient beliefs about the likely consequences of a contemplated course of action" (Ajzen, 2010). In the case of fertility decision-making, individuals would be expected to reflect on their attitudes about having a child before forming their fertility intentions. Such attitudes are a person's internal evaluation that having a child will have positive or negative (i.e., desirable or non-desirable) consequences for her/him.

The "subjective norms" are related to the perceived normative beliefs and expectations of relevant referent groups or individuals who exert social pressure to perform or avoid the behavior. In the case of fertility intentions, individuals would be expected to consider subjective norms for having a child; i.e., the individual's perception of the psychological support of or normative pressure on her/his fertility behavior from members of her/his close social circle.

Finally, individuals are assumed to take into account factors that may promote or hinder their ability to perform the behavior, and these salient control beliefs lead to the formation of "perceived behavioral control". This refers to the perceived capability of performing the behavior. Because many behaviors pose difficulties in execution, it is useful to consider perceived behavioral control over having a child in addition to intentions. Like attitudes and subjective norms, perceptions of behavioral control follow consistently from readily accessible beliefs about resources and obstacles that can facilitate or interfere with the ability to have a child, such as income or wealth, labor force status, and education (Billari et al., 2009). The power of each control factor to facilitate, or inhibit, behavioral performance is expected to contribute to perceived behavioral control in direct proportion to the subjective probability that the control factor is present in each person (Ajzen, 2010).

According to Ajzen and Klobas (2013) fertility intentions are also expected to result in having, or not having, a child to the extent that people are in fact capable of attaining their goals, i.e., to the extent that they have actual control over having a child. Actual behavioral control is thus hypothesized to moderate the effect of intention on behavior. Because actual behavioral control is identifiable with difficulty, perceived control is often used as a proxy for actual control, under the assumption that perceptions of control reflect actual control reasonably well.

Demographic research directed toward explaining or predicting fertility intention within the reasoned action tradition of the TPB has focused primarily on the intention to have a child relative to the intention to not have a child