

Fertility intentions: An approach based on the theory of planned behavior

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Abstract

OBJECTIVE

To discuss issues and concerns in the application of the theory of planned behavior (TPB) to the decision to have a child.

METHOD

We review the basic structure of the TPB, its principles, and its assumptions as they apply to fertility decisions. Among other issues we consider attitudes, subjective norms, and perceptions of control as antecedents to the decision to have a child; the expectancy-value model for understanding the formation of these antecedents; and the role of background factors, such as institutional policies, societal values, and personal characteristics. We illustrate key elements of the TPB using results from a multinational research project and end by considering a number of open questions for TPB-guided fertility research.

CONCLUSIONS

We conclude that the TPB can usefully be employed to further our understanding of fertility decisions. By examining behavioral, normative, and control beliefs about having a child we can identify important considerations that influence this decision. The information obtained can also guide adoption of policies or interventions designed to encourage (or discourage) couples to have more children.

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1. Introduction

Fertility intentions are central to discussions of family planning and fertility rates in developed countries. Whether implicit or explicit, behind the emphasis on fertility intentions is the assumption that, at least in developed countries with readily available contraception, having a child is the result of a reasoned decision. That this issue is more complicated than may appear at first glance is indicated by the fact that, even in developed countries, a large number of pregnancies are unintended and result in abortions or unwanted deliveries (e.g., Ventura, Curtin, Abma, and Henshaw 2012; see also Morgan and Bachrach 2011).

1.1 Intended versus actual family size

Demographers study fertility intentions for at least two reasons (see Philipov 2011). First, they use intentions to help predict fertility rates in a given population. Early research suggested that these predictions tend to be quite accurate at the macro level: Realized fertility rates were found to correspond quite closely to mean family size intentions (e.g., Bumpass and Westoff 1969; Hagewen and Morgan 2005; Schoen, Astone, Kim, and Nathanson 1999; Westoff, Mishler, and Kelly 1957). For example, in the 1930s, the mean intended family size in a sample of about 300 U.S. couples was 2.7; twenty years later, the actual family size was 2.6 (Westoff et al. 1957). In a later study (Bumpass and Westoff 1969), mean desired family size among couples with 2 children was 3.3, and actual completed family size was also 3.3.

However, at the individual level, this research documented considerable over- and under-estimates of completed family size. For instance, Bumpass and Westoff (1969) reported a correlation of 0.56 between women's intended and actual family size. Similarly, in the first wave of a survey of white women with one child (Schoen et al. 1999), the correlation between intentions to have another child and giving birth to a child in the following five years was 0.98 at the aggregate level but only 0.46 at the individual level. The contrasting findings regarding aggregate- versus individual-level correlations are explained by the fact that the number of unwanted children tends to be balanced by the number of unrealized intentions. Thus, in the Bumpass and Westoff survey, 30% of the women had more children than intended, while an equal percentage had fewer children than intended.

More recent research in developed countries has revealed a consistent "fertility gap." Although the desired family size varies greatly across European countries, the ideal number of children in the completed family usually exceeds the actual number (Coleman 1996; Goldstein, Lutz, and Testa 2003). In 2006, for example, the mean

desired number of children in Ireland was about 3, while the actual fertility rate in that country was slightly less than 2 children per woman. Similarly, in Austria the ideal number of children was only about 2, yet the actual fertility rate was even lower at about 1.3 (OECD 2010a).

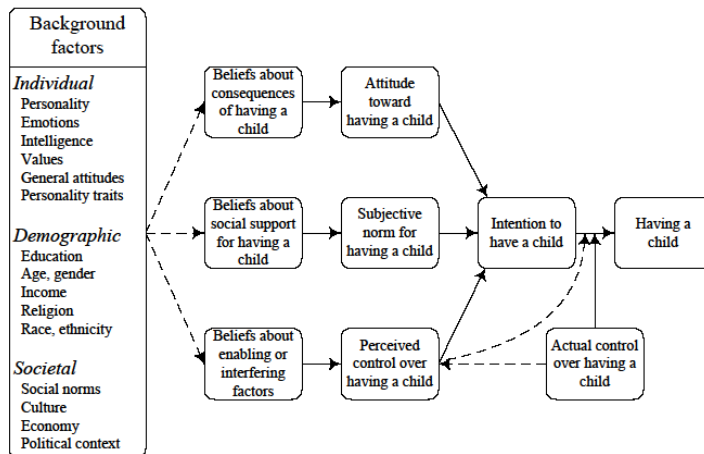
These kinds of findings have led many demographers to pursue a second aim in their research on fertility intentions; namely to further our understanding of the factors that are responsible for the realization or frustration of these intentions. The focus of this stream of research has been on demographic, economic, and societal variables, both micro- and macro- level, believed to influence fertility rates. The research results are mixed and appear to be contingent on the contextual factors included in the model. To illustrate, the OECD's explanation of changes in fertility rates emphasizes the effects of both demographic and societal changes – increases in education and labor force participation, changes in patterns of union formation and child rearing, changing societal norms and individual values about the role of women – and the interactions among these variables, and concludes that female labor force participation has a positive impact on fertility (d'Addio and d'Ercole 2005). On the other hand, studies that observe similar variables but control for country-level effects find that total fertility rate decreases with increases in female employment. When Del Boca, Pasqua, and Pronzato (2009) controlled for income and level of education of the individuals in their multi-level study, they found differences in the effects of national policies on childcare arrangements, parental leave, family allowances and labor market participation. Thus, this line of research, and its strong link to discussions of policy Thévenon (2011), affirms an underlying assumption that factors such as income, education, availability of child-support services, values, societal norms, and policies can help account for the extent to which fertility intentions are realized.

2. The theory of planned behavior

In the present article we focus on a different, though related, issue that has received much less attention in demographic research, namely the question of what determines fertility intentions in the first place. Our approach is based on the theory of planned behavior (TPB; Ajzen 1991, 2005, 2012) and we try to show how this theory can contribute to our understanding and modeling of the social-psychological processes involved in forming the intention to have (or not to have) a child. Briefly, according to the TPB, the intention to have or not to have a child is determined by three kinds of considerations (see Ajzen 2013). The first is termed *behavioral beliefs*; it refers to the perceived positive or negative consequences of having a child and the subjective values or evaluations of these consequences. In their aggregate, behavioral beliefs lead to the

formation of a positive or negative *attitude* toward having a child. A second kind of consideration has to do with the perceived expectations and behaviors of important referent individuals or groups, combined with the person's motivation to comply with the referents in question. These considerations are termed *normative beliefs* and they combine to produce a perceived social pressure or *subjective norm* with respect to having a child. Thirdly, *control beliefs* are concerned with the perceived presence of factors that can influence a person's ability to have a child. Together with the perceived power of these factors to facilitate or interfere with having a child, control beliefs produce a certain level of *perceived control* (or *self-efficacy*, Bandura 1997) in relation to having a child. More detailed descriptions of the nature of the three predictors of intentions are provided below. As a general rule, the more favorable the attitude and subjective norm with respect to having a child, and the greater the perceived control, the more likely it is that a person will form an intention to have a child. Finally, fertility intentions are 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 expected to moderate the effect of intention on behavior. However, in many applications of the TPB, it would be difficult or impossible to identify all the factors that influence actual control over performance of a given behavior. For this reason, investigators typically use perceived control as a proxy for actual control under the assumption that perceptions of control reflect actual control reasonably well. A schematic representation of the TPB as applied to fertility is shown in Figure 1.

Figure 1: The theory of planned behavior applied to fertility decisions



2.1 Behaviors versus goals

One difficulty in applying the TPB in the fertility domain is defining an appropriate behavioral criterion. Although having a child, for instance, is commonly described as fertility behavior, it is not so much a behavior as the outcome of one or more antecedent behaviors (e.g., having sex with a fertile partner of the opposite sex, not using a contraceptive) that result in pregnancy. Any one of those behaviors might be studied using the TPB, and indeed, the TPB has long been used to model various sexual behaviors, most notably condom use (Albarracín, Johnson, Fishbein, and Muellerleile 2001). Outside of the field of sexual health, however, the term *fertility behavior* usually refers to an outcome or behavioral goal (such as having a child or a family of a certain size) rather than a behavior that might result in attainment of the goal.

It is worth noting in this context that people generally have greater control over performance of a behavior than they have over attaining a goal the behavior is intended to produce. This follows from the fact that in order to attain a goal, individuals must not only have control over performance of a required set of behaviors, but these behaviors must also be effective in bringing about the desired goal. Degree of actual control is affected by personal as well as contextual factors. For example, health and partnership status can define actual control which, if favorable, will enable people to act on their intentions to have a child or, if unfavorable, will make it difficult for them to have a child despite their intentions to do so. To illustrate, a man who intends to have a child may have a willing female partner, engage in unprotected sex with her, and thus exhibit control over the required behaviors, yet he may fail to attain his goal if he or his partner is infertile or if the pregnancy ends in a miscarriage.

The question of actual control has little bearing on application of the TPB to the prediction of *intentions* to attain a behavioral goal. Intentions to attain a behavioral goal, such as having a child, should be predictable from attitudes, subjective norms, and perceived control with respect to the goal in question. For example, the TPB has been used to predict intentions (and actual attainment of) weight loss (Schifter and Ajzen 1985) and a high course grade (Ajzen and Madden 1986). Similarly, recent studies in the fertility domain demonstrate that intentions to have a child (in formal terms, intention to attain the behavioral goal of having a child) can be predicted from attitudes, subjective norms, and perceived control with respect to having a child (Billari, Philipov, and Testa 2009; Dommermuth, Klobas, and Lappegård 2011; Klobas, 2010; Klobas and Ajzen, in press).

While attitudes, subjective norms, and perceived control can be used to predict fertility intentions, it is important to define the precise behavioral goal with respect to which the intention is assessed. Possible fertility-related goals include the following.

1. Having a child or another child during the next 3 years.
2. Having a child with my current partner in the next 3 years.
3. Having my first child before I turn 32.
4. Having another child before I turn 40.
5. Waiting until my youngest child is old enough to go to school before having another.
6. Having a completed family of 2 children.
7. Remaining childless.
8. Taking the full amount of family leave available to me after the birth of my child.

Once the behavioral goal has been clearly defined, intentions, attitudes, subjective norms, and perceived control can be measured commensurately. In the discussions below, we focus on the goal of having a child.

2.2 The principle of compatibility

According to the TPB's *principle of compatibility* (see Ajzen 2005), any well-defined behavior or behavioral goal can serve as a criterion for study as long as attitudes, subjective norms, perceptions of control, and intentions are assessed with respect to exactly the same criterion. The goal of having a child involves a specific action and target and often also a specific context (e.g., with my current partner) and time frame (e.g., in the next 3 years). In contrast, background factors such as general attitudes (e.g., toward gender roles or over-population) and values (e.g., of children or the family) identify only a target; they do not specify any particular action, context, or time element. Similarly, such demographic characteristics as age, gender, income, and level of education lack specificity in any of the four elements. This lack of compatibility could explain the low, inconsistent, and often non-significant relations between general dispositions and demographic variables on one hand and child-bearing intentions on the other.

Empirical support for the compatibility principle is strong and consistent (for a general review, see Ajzen and Fishbein 1977; Fishbein and Ajzen 2010). The most compelling support for the importance of compatibility in attitude-behavior research comes from studies that have directly compared the predictive validity of attitudes that

were compatible (i.e., attitudes toward behaviors or goals) or incompatible (i.e., attitudes toward general targets) with a specific criterion. In a meta-analysis of eight studies that manipulated level of compatibility (Kraus 1995), the mean correlation between general attitudes and particular behaviors was only 0.13 whereas the prediction of behavior from attitude toward the behavior in question resulted in a mean correlation of 0.54. In section 3 we present similar results from recent fertility research.

2.3 Attitudes toward having a child

As noted earlier, behavioral beliefs form the basis for the formation of attitudes. The way in which beliefs are assumed to influence attitudes toward having a child can be described as follows. Recall that each behavioral belief links having a child to a particular outcome, and each outcome has a certain subjective value. The strength of the beliefs and the outcome evaluations combine to produce an overall positive or negative attitude toward the behavior. More formally, the subjective value or evaluation of each outcome contributes to the attitude in direct proportion to the person's subjective probability that having a child will produce the outcome in question. This expectancy-value model of attitude (Ajzen and Fishbein 1980; Fishbein and Ajzen 2010) is shown in Equation 1, where A stands for attitude toward having a child, b_i is the subjective probability or belief that having a child will produce outcome i , e_i is the evaluation of outcome i , and the sum is over the total number of beliefs.

$$A \propto \sum b_i e_i \quad (1)$$

Insight into the factors that underlie attitudes toward having a child depends on obtaining accurate information about the behavioral beliefs that are important for this decision. These beliefs are usually identified in formative research in which readily accessible outcomes are elicited in a free-response format from a representative sample of the population.³ The beliefs most frequently mentioned are then included in the survey of the main study.

Although the beliefs about having a child identified by Langdridge, Sheeran, and Connolly (2005) were based on information obtained in prior research, they can be used to illustrate the nature of behavioral beliefs in this domain. In their study of 874 white married couples without children in the U.K., the investigators identified 35 reasons for and against having a child. Of these, six reasons for having a child and five reasons against having a child were found to discriminate significantly between participants

³ It is usually not advisable to rely on beliefs identified in prior research because beliefs often differ from population to population and can change over time.

who intended to have a child and those who did not, as shown below.

Reasons for having a child

- would be fulfilling
- would please my partner
- would make us a family
- would be part of both of us
- would give a child a good home
- it's a biological drive

Reasons against having a child

- there are more important things in life
- would restrict my freedom to do the things I enjoy
- my partner does not want a child
- would interfere with my career
- concern with over-population

Each of these reasons may represent a behavioral belief, e.g., (I believe that) having a child would be fulfilling or (I believe that) there are more important things in life than having a child. The findings also suggest that beliefs with respect to not having a child are not mirror images of beliefs with respect to having a child. As a general rule, beliefs about alternative goals provide different kinds of information, and each type of belief may contribute independently to the attitude toward having a child and, ultimately, to the intention to have a child. Indirect evidence for this hypothesis comes from a study in a different domain, use of the car versus alternative transportation (Gardner and Abraham 2010). Attitudes, subjective norms, and perceptions of control with respect to using a car produced a multiple correlation of 0.53 with intention to use the car. The addition of parallel measures with respect to not using a car increased this correlation to 0.66, a significant increase of 16% in explained variance.

2.4 Subjective norm with respect to having a child

The relation between normative beliefs and subjective norm with respect to having a child is similar in structure to the expectancy-value model of attitude. Specifically, the TPB postulates that the subjective norm (*SN*) with respect to having a child is determined by all readily accessible normative beliefs in relation to important referents. As can be seen in Equation 2, the strength of the normative belief with respect to

referent i (n_i) is weighted by motivation to comply (m_i) with that referent, and the products are summed across all accessible referents.

$$SN \propto \sum n_i m_i \quad (2)$$

A distinction can be drawn between *injunctive* and *descriptive* normative beliefs (Cialdini, Reno, and Kallgren, 1990; Fishbein and Ajzen, 2010). Injunctive normative beliefs are formed when we are told or when we infer what important others want us to do, whereas descriptive normative beliefs are usually based on the observed or inferred actions of those social referents. Important normative referents for the decision to have a child include one's partner⁴ (Thomson 1997), parents (Barber 2000), and friends (East, Felice, and Morgan 1993). While most TPB research draws on injunctive norms (e.g., beliefs about the opinions others hold about the respondent having a child, as measured in the Generations and Gender Survey, GGS (Vikat et al. 2005, 2007), fertility research can also draw on descriptive norms, such as the number of siblings in the decision maker's family (Axinn, Clarkberg, and Thornton 1994) or the number of children among the decision maker's closest friends (East, Felice, and Morgan 1993).

Referring to the list of behavioral beliefs we provided earlier, it is worth noting that the behavioral belief "My partner would be pleased if I have a child" is different from the injunctive normative belief "My partner wants me to have a child." Clearly, these beliefs are related to one another, but they are different: A woman might believe that her best friend has no strong opinion about whether she should have a child or not, but at the same time also believe that her friend would be pleased if she were to have a child.

2.5 Perceived control over having a child

Finally, the structure of an expectancy-value model can also be used to describe the relation between control beliefs and perceived behavioral control (PBC) in relation to having a child. Control beliefs are concerned with resources and obstacles that can facilitate or interfere with having a child. The perceived power of each readily accessible control factor to facilitate or interfere with having a child is assumed to contribute to perceived control in direct proportion to the person's subjective probability that the control factor is present. In Equation 3, c_i is the subjective probability or belief that control factor i is present, p_i is the power of control factor i to

⁴ In addition to serving as an important normative referent, a partner who is opposed to having a child would usually also constitute a significant barrier to attaining this outcome.

facilitate or interfere with having a child, and the sum is over the total number of accessible control beliefs.

$$PBC \propto \sum c_i p_i \quad (3)$$

The correct conception of PBC is critical to understanding and using the TPB. A control belief is not the same as a constraint or a perceived constraint. In the fertility domain, lack of suitable housing is often cited as an important constraint on having a child (Chesnaix 1996). Drawing on this observation, in the GGS (Vikat et al. 2005) respondents were asked to report how much their decision to have a child “depends on... your housing conditions”. In this example, if the decision depends “a great deal” on housing conditions, we have a measure of the perceived importance of the factor (p_i), but we also need a measure of the expectation (belief) that this factor will be present (c_i). Similarly, with regard to childcare, if we are to predict the effect of a control belief relative to childcare on the intention to have a child, we need to know not only that the availability of childcare is important to the decision to have a child, but also the extent to which the decision-makers believe they have access to suitable childcare.

2.6 The role of background factors

In addition to its core focus on the formation of intentions and the relationship between intentions and behavior, the TPB provides a link to personal characteristics and contextual factors of the kind that are often included in fertility research. We have already seen that some contextual factors – including those that reflect institutional policy – can be modeled within the TPB as an actual control which both moderates the effect of intentions on behavior or goal attainment and influences intentions through its effect on perceived control. In addition, personal characteristics, values, needs, and other dispositions – along with other background factors – can influence intentions (and thus behaviors) by affecting the beliefs that give rise to attitude, subjective norm, and perceived behavioral control (see Figure 1).

Many different kinds of background factors are of potential relevance to the decision to have a child and to attainment of this goal. There is nothing in the theory of planned behavior to suggest which of these factors deserve our attention. However, we can enlist the help of content theories specific to the fertility domain as well as the results of prior research to identify potentially relevant background factors. When a given background factor included in a survey is found to influence fertility behavior, the TPB permits us to explain this finding by tracing the factor’s effects on beliefs,

attitudes, subjective norms, perceptions of control, and intentions with respect to having a child. Conversely, when a given background factor fails to correlate with fertility, we can also explain the failure if the background factor is found to have no effect on the variables in the TPB.

Among the factors that could be modeled as background factors in the fertility domain are those that have been shown in past research to affect fertility rates and fertility intentions. They include personality traits, general attitudes and beliefs such as those about gender roles and the acceptability of remaining childless, general life values such as the value of children or materialist and postmaterialist values, the general desire for children, religiosity, as well as demographic characteristics such as age, sex, education, and income.

Individual background factors might in their turn be influenced by general prevailing social norms (e.g., norms as to the age by which a man or a woman is expected to have had their first child) and wider national or regional cultural values such as generally accepted values of children and their roles. Indeed, the institutional context, including policies and the wider economic and political environment, are likely to affect not only actual and perceived control as we discussed earlier, but also certain background factors – at least income and education – and also desires and, in certain circumstances, general attitudes and values.

2.7 The logic of the reasoned action approach

The theory of planned behavior has on occasion been faulted for positing rational actors who carefully plan their behavior when, it is suggested, human behavior is often irrational or spontaneous, based largely on judgmental heuristics and intuition (see, for example, Gibbons, Gerrard, Blanton, and Russell 1998; Reyna and Farley 2006). For similar reasons, it has also been argued that the TPB is not an appropriate model for fertility (Morgan and Bachrach 2011) because the very fact that many pregnancies are unplanned is *prima facie* evidence that fertility behavior is neither intentional nor planned. We can dispense with this argument quickly by recognizing, as noted earlier, that having a child is not a behavior but the outcome of certain behaviors. There is nothing in the TPB to suggest that behaviors designed to attain certain outcomes, or to avoid certain outcomes, will necessarily result in goal attainment. Unprotected sex, the behavior, may well have been intentional, even if pregnancy, the outcome, was not (Ajzen 2011).

Nevertheless, it is true that the TPB is focused on the controlled aspects of human judgment and decision making. According to the theory, subjective information in the form of behavioral, normative, and control beliefs provides the foundation for attitudes,

subjective norms, and perceptions of control; and these variables lead to the formation of intentions which, ultimately, result in behavior. It is in this sense, and only in this sense, of internal consistency that the decision to have or not to have a child is considered reasoned. The focus on reasoned action should not be misinterpreted to mean that the TPB posits a rational actor who reviews all available information in an objective, unbiased fashion and carefully plans every behavior. For one, frequently performed behaviors, such as using a condom, can become routine and no longer require careful deliberation. But even the decision to have or not to have a child which may well involve careful deliberation can be based on behavioral, normative, and control beliefs that are inaccurate and incomplete; beliefs that rest on faulty or irrational premises, are biased by wishful thinking, or otherwise fail to reflect reality (see Ajzen 2012 for a discussion of these issues). Clearly, this view of fertility-related decisions represents a far cry from a rational actor.

2.8 Empirical support for the theory of planned behavior

Empirical support for the TPB comes from tests of the model in many different behavioral domains. Meta-analyses of research findings have confirmed that behavioral, normative, and control beliefs correlate, as expected, with direct measures of attitudes, subjective norms, and perceptions of control; and that these variables account for a great deal of the variance in intentions (for a review, see Fishbein and Ajzen 2010). Across different meta-analyses (Armitage and Conner 2001; Cheung and Chan 2000; Notani 1998; Ravis and Sheeran 2003; Schulze and Wittmann 2003), the average multiple correlations for the prediction of intentions ranged from 0.59 to 0.66. Also, intentions are generally found to be good predictors of behavior (Sheeran 2002). In meta-analytic syntheses of studies in various behavioral domains, mean intention-behavior correlations have ranged from 0.44 to 0.62 (e.g., Armitage and Conner 2001; Hagger, Chatzisarantis, and Biddle 2002; Notani 1998; Randall and Wolff 1994; Sheppard, Hartwick, and Warshaw 1988). Moreover, confirming the causal effects of intentions, experimentally induced changes in intentions are found to be followed by corresponding changes in behavior. In a meta-analysis of 47 such studies, Webb and Sheeran (2006) reported that, on average, the interventions resulted in a mean effect size of 0.66 for changes in intentions, followed by changes in behavior with a mean effect size of 0.36. Also of interest, in a recent meta-analysis of Internet-based interventions (Webb, Joseph, Yardley, and Michie 2010), theory-based interventions were found to be superior to interventions not based on any theoretical framework; and of all theory-based interventions, those that relied on the theory of planned behavior had the strongest impact.

3. Fertility research and the theory of planned behavior

In this section we illustrate key elements of the TPB relying on the results of empirical studies conducted in the fertility domain. We primarily use results from research conducted within the European Commission Framework 7 Reproductive Decision Making in a Macro-Micro Perspective (REPRO) project (see http://ec.europa.eu/research/social-sciences/projects/429_en.html), although we also draw on data from other surveys as appropriate.

The TPB was used in the REPRO project to model fertility decision making at the individual (micro) level. It was also used as a macro-micro pivot to model how macro-level conditions, institutions, policies, and culture might affect micro-level decisions, as well as how macro-level demographic outcomes might reflect these decisions (Philipov, Liefbroer, and Klobas, in press). Several models were built to compare fertility decision making across countries and test the value of using the TPB to examine various issues in the modeling of fertility decision making.

Data for the REPRO project were drawn from the GGS, a context-sensitive multidisciplinary panel survey of inter-generational and gender relationships in 25 countries. The GGS takes a life course approach to the social dynamics of decisions about leaving home, union formation, child bearing, and retirement, using the TPB as a theoretical framework (Vikat et al. 2005).

Population representative samples of around 10,000 were taken in 25 countries in Wave 1 of the GGS, and data from nine GGS Wave 1 countries were used in the different REPRO studies described in this section: France (data collected in 2005), Georgia (2006), Germany (2005), Hungary (2004-2005), Italy (2003), Norway (2008), Russia (2004) and Romania (2005). The REPRO sample consisted of all participants in the GGS Wave 1 survey in these countries who met the following criteria: Females aged between 18 and 49 who were able to have a child and who were not currently pregnant, and males aged 18 and over who were able to have a child and who did not report having a female partner aged 50 or over. Additional details of the GGS sampling procedure and the specifics of each national sample, along with harmonized data, are available from <http://www.ggp-i.org/data/data-access.html>. More details of the full REPRO sample and its characteristics are available in Klobas (2010) and Klobas and Ajzen (in press). Details of the sample used in each of the analyses reported in this section are shown with the analyses.

The standard form of the GGS Wave 1 questionnaire included eleven (behavioral) beliefs about the anticipated effect of having a/another child on such outcomes as “the possibility to do what you want”, “employment opportunities”, “joy and satisfaction in life”, and “care and security in old age”; three normative beliefs – about the respondent’s perceptions of parents’, other relatives’ and friends’ opinions about their

having a/another child; and nine control-related items asking to what extent the respondent's decision to have another child during the next three years "depends on" factors such as their financial situation, work, housing conditions, health, having a suitable partner and availability of child care. The standard measurement scale for the behavioral beliefs was a 5-point fully anchored scale from 1 (*much better*) to 5 (*much worse*). Normative beliefs were measured on a 5-point scale from 1 (*strongly agree*) to 5 (*strongly disagree*) and the control items on a 4-point scale of 1 (*not at all*), 2 (*a little*), 3 (*quite a lot*), 4 (*a great deal*). In Norway, all beliefs were measured on 11-point scales anchored only at the end points: The behavioral beliefs scale ranged from 0 (*much worse*) to 10 (*much better*), normative beliefs from 0 (*completely disagree*) to 10 (*completely agree*), and control items from 0 (*much worse*) to 10 (*much better*). Measurement of intention for each analysis reported below is described with the analysis.

A limitation in the measurement of perceived control might affect the results of studies based on Wave 1 of the GGS. While perceived importance of control factors was assessed by the Wave 1 items, the respondent's belief that they would be in control of that factor was measured imperfectly: For some factors, such as housing conditions, it was measured in generic terms ("I will have control over... my housing conditions") rather than specifically for having a child ("I will be able to house another child"), and it was not measured at all for other factors, such as childcare. In the analyses reported below, the measure of perceived control was therefore limited to the perceived importance of the control factors. The effects of perceived control reported in the results that follow are therefore likely to be underestimated.

3.1 Predicting fertility behavior from intentions

The earliest work on fertility in the reasoned action tradition showed that fertility intentions predicted fertility behaviors quite well (Vinokur-Kaplan 1978), and this has been confirmed in more recent studies (e.g., Gillmore et al. 2002). As mentioned earlier, contemporary research on the link between fertility intentions and fertility behaviors has been motivated by the observation that in many countries expressed family size desires are not matched by actual completed family size (the so-called 'fertility gap') (Bongaarts 2001; Chesnais 2000). Desired fertility is not the same as intended fertility, but differences between intended and actual family size have also been observed in the United States (Quesnel-Vallée 2003). People's failure to realize their initial childbearing intentions can be attributed to at least two factors. First, in many countries there is a tendency to postpone having children due to conflicting career aspirations or other motivations. As a result of declining fertility with age, individuals

and couples who intend to have a certain number of children early in their relationship may fail to realize their intentions (Sobotka 2004). Second, new information can become available that produces changes in previously formed intentions. This is likely to be the case with intentions to have another child. For example, once a child has been born, individuals and couples learn from the experience, and the new information becomes input into the attitudes, subjective norms, and perceived control that determine intentions for the future. Childbearing intentions are revised after the birth of a new child (Monnier 1989; Udry 1983) and, indeed, family size intentions do change over time. In a recent study of about 5,500 households in the U.K. (Iacovou and Tavares 2010), family size intentions were adjusted both up and down throughout the life course, with later life intentions converging on actual family size.

3.2 Perceived control as a proxy for actual control

Using data from the Norwegian GGS, Dommermuth et al. (2011) used the TPB to study the factors that differentiated between intentions to have a child in the short term (“now”) rather than later for people who intended to have a child some time during the next three years. Despite the measurement deficiencies in regard to perceived control identified earlier, perceived control contributed significantly to the prediction of intentions, and it appeared to be a suitable proxy for actual control. More positive attitudes, subjective norms, and perceived control for having a child were all associated with more favorable intentions to have a child in the short term rather than later. After adding items that measured actual control in similar terms to the items that measured perceived control, several actual control factors (most notably, available housing) had a significant effect on intentions while the significant effect of perceived control was no longer observed. This confirmed both that perceived control reflects actual control and that, empirically, perceived control can be used as a proxy for actual control when actual control cannot be measured.

3.3 Effects of attitudes, subjective norms and perceived control on fertility intentions

In most countries, the fertility section of the GGS used one item to measure intention to have a child in the near term: “Do you intend to have a (another) child during the next three years?” with responses *definitely yes*, *probably yes*, *probably not*, and *definitely not*. For the analyses discussed in this and in subsequent sections, this variable was collapsed to a three-point scale: *yes* (intended definitely to have a child during the next

three years), *uncertain* (either *probably yes* or *probably not*), and *no* (intended definitely not to have a child during the next three years).

In the REPRO project, structural equation modeling (SEM) software (AMOS and MPlus) was used to develop a measurement model for attitude, subjective norm, and perceived control that would support cross-national comparison. Subsequent structural equation modeling showed that, as predicted by the TPB, attitudes, subjective norms and perceived control had differential effects on intentions to have a child in different contexts in the eight countries included in the cross-national comparison (Klobas 2010; Klobas and Ajzen, in press). Table 1 illustrates these results. It shows how attitude, subjective norm, and perceived control affected the fertility intentions of respondents who were aged 25 to 34 and had a resident partner (either married or cohabiting) and one child (parity = 1) at the time of the GGS Wave 1 interview in five different European countries.⁵ Descriptive statistics for this group of respondents appear in Table 2. Together, attitudes, subjective norms, and perceived control had a multiple correlation with intentions of between 0.32 (Italy, where one or more key beliefs for each of the TPB variables was omitted from the GGS instrument, resulting in weaker measurement across the model) and 0.6 (Germany).

Table 1: Effects of attitudes, subjective norms and perceived behavioral control on intention to have a child during the next three years, 25 to 34 year olds with a resident partner and one child, in five countries

Country	Intention (% definitely yes)	TFR	Effect (standardized coefficients)			Multiple correlation
			Attitude	Subjective norm	Perceived control	
Russia	14.1	1.33	.30***	.24***	.11***	.50
Italy	22.6	1.28	.25***	.09*	.06 ns	.32
Germany	30.4	1.34	.29***	.40***	.08 ns	.60
France	47.9	1.92	.32***	.10 ns	.30***	.49
Hungary	48.9	1.28	.38***	.16***	.02 ns	.45

Note: Bayesian multigroup model (AMOS 19); random walk; tuning parameter = 0.7; 500 burn-in observations; convergence < 1.0002, posterior p = .45.

TFR = Total Fertility Rate for country, year that GGS data were collected (2004-2005). Data from World Bank (2008).

* p < .05. ** p < .01. *** p < .001. ns = not significant at .05.

⁵ The results reported here use simplified measurement, the mean score on all items included in the GGS attitude, subjective norm scales for the country, and an indexed value of perceived control that divides respondents into quartiles by mean score on all items on the GGS perceived control scale, rather than the SEM measurement models presented in Klobas and Ajzen (in press) and Klobas (2010). This approach provides a large enough sample in each country for cross-country comparison. The structural model for this manifest variable model includes correlations among all TPB variables.

Table 2: Descriptive statistics, 25 to 34 year olds with a resident partner and one child, five countries

	Russia	Italy	Germany	France	Hungary
n	667	544	217	214	544
Intention (%)					
Definitely yes	14.1	22.6	30.4	47.9	48.9
Unsure	61	66.9	35.9	39.4	25
Definitely no	24.9	10.5	33.6	12.7	26.1
Means ^a					
Attitude	2.91	2.86	3.08	2.80	2.98
Subjective norm	2.93	2.01	3.11	2.92	3.06
Perceived control	2.30	2.34	2.01	1.67	2.08
Correlations					
Attitude - Subjective norm	.37	.32	.32	.21	.22
Attitude - Perceived control	.31	.22	.30	.04	.26
Subjective norm - Perceived control	.23	.11	.19	.08	.08

Note: ^a Lower values are more favorable.

The standardized coefficients in Table 1 permit comparison among countries in terms of the relative effects of the TPB variables on the intention to have a child in the next three years, and show quite distinct differences. (Data that permit cross-country comparison of effect sizes are presented in Appendix 1.) Attitude to having a child had the strongest effect on intention to have a child in three of the five countries (Russia, Italy, and Hungary), while the effects of attitude and perceived control were equally strong in France, and subjective norm had a stronger effect than attitude in Germany. Perceived control had a statistically significant effect in only two countries: a relatively weak effect in Russia and, as noted, an effect equal to that of attitude in France.⁶ There is no obvious demographic classification of the countries with the majority pattern; the dominant issues for parents of one child who are living together and making the decision to have their second child appear to be related primarily to their beliefs about the extent to which having another child will make their lives better or worse. The variation to this pattern in Germany might be explained by the relatively strong perceived norm not to have a second child combined with the belief that, on average, having a second child would have negative outcomes (see Table 2): In this set of circumstances, parents might be particularly influenced by perceived social norms. France has strong family policies relative to the other countries (Thévenon 2011). These

⁶ Given the limitations on measuring perceived control in the GGS, further research is needed to define the effect of perceived control more accurately.

policies might create the background of high control seen in the French sample, as well as the conditions that permit control to have a relatively strong effect on intention to have a second child: In France, parents who lived in the same household made their decision to have a second child independently of others' opinions, based on their own attitudes and perceptions of control.

3.4 Effects of compatibility

Attitude to childlessness is a marker of the changes in societal norms and values that have accompanied the decrease in fertility rates (Lesthaeghe 2010). The GGS adapted an item from the World Values Survey (<http://www.worldvaluessurvey.org/>) to gauge respondents' attitudes to childlessness in society by asking for agreement to two statements, "A woman has to have a child to be fulfilled" and "A man has to have a child to be fulfilled". Of course, one's general attitude toward childlessness – acceptance that it is fine for some people in society to choose never to have a child – is not the same as one's own belief that childlessness is a good or a bad thing personally. Applying the principle of compatibility, we would expect that asking people about compatible attitudes toward personally having a child provides a better explanation of intention to have a child than the general attitude to childlessness. This expectation was confirmed when we analyzed data from the French GGS. Among 2,282 respondents aged under 35, attitude to childlessness (measured as the higher of the two scores) had a regression coefficient of 0.11 ($p < .05$) in the prediction of intention to have a child, while attitude to having a child inferred from beliefs about the effect of having a child on financial situation, employment opportunities, housing, joy and satisfaction in life, and care and security in old age had a regression coefficient of 0.51 ($p < .001$).

3.5 Effects of background factors

Age provides an example of how background factors are modeled in the TPB. The effect of age on intention to have a child during the next three years among 265 childless women in France aged under 40 who had a resident partner was examined separately using the REPRO dataset. The mean age of the women was 26.1 (SD = 4.6) and 44.2% of them intended to have their first child during the next three years, while 42.6% were unsure and 13.2% did not intend to have a child in that time. Age had a (standardized) effect of 0.26 on intention.⁷ When attitude, subjective norm, and

⁷ AMOS 19 maximum likelihood structural equation model. Age squared had no significant effect and was dropped from the model.

perceived control were added to the model, age no longer had a statistically significant effect, an indication that the TPB variables completely mediated the effect of age on intention. Furthermore, introducing the TPB variables as mediating factors increased the (multiple) correlation substantially from 0.26 to 0.55 (see Table 3).

Table 3: Age as a background factor: Direct effect on intention to have a child (Model 1) and effect as a background factor fully mediated by compatible attitudes, subjective norms and perceived behavioral control (Model 2), childless women under 40, France

	Model 1	Model 2	Total effect on Intention
	Direct effect on Intention	Direct effects on ...	
Age	.26***	Intention: .10 ns Attitude: .19** Subjective norm: .38*** Perceived control: .19**	.26
Attitude	-	Intention: .41***	.41
Subjective norm	-	Intention: .20***	.20
Perceived control	-	Intention: .03 ns	.03
(Multiple) correlation	.26		.55

Note: n = 265. Standardized coefficients, path models, prepared with AMOS 19.0. All variables are composite variables with no specified measurement error.

* p < .05. ** p < .01. *** p < .001.

Modeling the effect of age as being mediated by attitudes to having a child, subjective norm for having a child, and perceived control for having a child increases our understanding of how this background factor works to influence fertility decisions. In this group of women, increased age was associated with more positive attitudes to having a child in the next three years (standardized effect = 0.19), stronger perceived normative pressure to have a child (0.38), and a stronger perception of control (0.19). The increase in the effect of age on normative pressure was twice that of its increase in attitudes and perceived control.⁸ Nonetheless, the indirect effect of age through each of the two significant paths (attitude and subjective norm) was very similar (about 0.17), and the total (indirect) effect of age on intention through the TPB variables (0.26) was greater than that of subjective norm (0.20). Thus, while use of the TPB confirms that age has an important effect on intentions to have a child, it also provides information about the nature of that effect: While childless women feel much stronger social

⁸ Although, the effect on perceived control is of no account in this case because perceived control has no significant effect on intention.

pressure to have a child as they become older, their expectations that having a child will be a positive addition in their life also become more positive, and together both attitude and subjective norm have a similar increasingly positive effect on their intention to have a child as they become older.

Another background factor of key importance in fertility research is parity, the number of children a person has at a given point in time. Of the background variables available to researchers in the REPRO project, parity explained more variance in fertility intentions than any other background factor: Variance estimate of 7.2% with $N = 38,813$; relative to age, 6.2%, partnership status, 1.1% and gender, 0.1% when taken alone; and 10.9% relative to individual effects of 2.3% for age and 1.5% for partnership status when the interaction between the three variables is taken into account (Klobas and Ajzen, in press). One possibility is to model parity as a background factor that influences intentions via beliefs. However, the strong effect of parity on fertility intentions can also be indicative of contextual variations that moderate the relative influence of attitudes, subjective norms, and perceived control on intentions. The decision to have one's first child and thus become a parent for the first time is qualitatively different from the decision to have a second or subsequent child and, indeed, empirical results demonstrate that the relative importance of different kinds of beliefs varies as a function of parity (Billari et al. 2009; Dommermuth et al. 2011). In most countries, the decision to have one's first child seems to be based primarily on beliefs about the benefits of having a child (attitudes), while the decision to have a second child is more complex, involving beliefs about possible gains and losses (attitudes), what others think (subjective norms), and whether it is feasible to look after another child (perceived control) (Klobas 2010).

3.6 The role of macro-level socioeconomic and institutional contexts

We suggested that the wider socioeconomic and institutional context might affect intentions by influencing background factors measured at the individual level. To date, data to test hypotheses of such effects are not available. One indication that national contextual differences affect beliefs comes from the REPRO project (Klobas 2010). An exploratory study of how institutional context might act throughout the cognitive decision-making process was conducted in REPRO by examining the beliefs of women making the decision to have their second child in different national child- and family-policy contexts (Klobas 2010). Six GGS countries were divided into two institutional policy contexts, based on the percentage of GDP spent on child- and family-friendly policy: Bulgaria (1.1%), Italy (1.3), and Romania (1.4) were classified as countries with less institutional support for children and families, while Germany (3.0), Hungary (3.1),

and France (3.8) were classified as contexts with more support (data from OECD, 2010b). The differences in control beliefs in these two sets of countries are particularly suggestive: Women in countries with more institutional support felt much more in control of the factors that might constrain them from having a child; a much higher proportion of these women also intended to have a second child. Moreover, among the countries with more support, substantially fewer women intended to have another child in Germany than in Hungary and France, and the main difference in beliefs among these three countries was that German women tended to believe that their friends and parents did not want them to have another child; i.e., the prevalent subjective norm in Germany was against having another child while the prevalent subjective norm in Hungary and France was neither favorable nor unfavorable.

In other REPRO results, the childbearing intentions of childless women aged 25 to 34 in Bulgaria, Georgia, Russia, Romania – four Eastern European countries with relatively low GDP (as reported by the World Bank 2008, for 2005, the year the GGS was conducted in most of the countries included in the analysis) – were strongly influenced by subjective norms and influenced less by beliefs about positive outcomes (positive attitudes) than the intentions of women in Italy, France, and Germany. Without further information, we can only speculate that in low-GDP countries, financial constraints produce social pressure to have fewer children, while in high-GDP countries, personal preferences dominate the decision. When the same countries (plus Hungary) were split by unemployment rate (Russia, Romania, and Italy classified as lower, and Bulgaria, Georgia, Hungary, Germany, and France as higher using 2005 employment rates as reported by Eurostat 2009), the intentions of women in countries with higher unemployment were more strongly influenced by subjective norms and perceived control. Even greater differences were observed among women with one child in the same age group. Underlying these disparities were differences in beliefs that contributed to the formation of attitudes, subjective norms, and perceived control in each group.

4. Discussion and conclusions

We have tried to show that the theory of planned behavior can usefully be employed to further our understanding of childbearing intentions. By examining behavioral, normative, and control beliefs about having a child we can identify important considerations that guide this decision. We have also seen how the TPB can help further our understanding of the role played by such background factors as nationality, general life values, attitudes to childlessness, personality characteristics, religiosity, and demographic variables such as age, parity, housing conditions, income, and education.

In this way, the TPB offers a bridge between macro- and micro-level analyses of fertility. Finally, the information obtained in a TPB survey can also guide adoption of policies or interventions designed to encourage (or discourage) couples to have more children.

Notwithstanding the potential benefits of a reasoned action approach to understanding child-bearing decisions, fertility research with the TPB faces practical difficulties. Much fertility research is done through large-scale population surveys, typically as part of a household survey that covers many other issues (e.g., the GGS, the Fertility and Family Surveys, the British Household Panel Survey, the US General Social Survey, the European Social Survey). Such surveys offer limited space for questions that form part of a bank of items to measure behavioral, normative, and control beliefs (as well as the theory's other constructs). Furthermore, such surveys usually do not lend themselves to a strict application of the standard approach to identification of important beliefs in TPB studies, i.e., use of qualitative elicitation studies with a representative sample to elicit readily accessible beliefs which are subsequently included as closed questions in survey research. Fertility-related surveys are often longitudinal and comparative in nature, and the included belief items need to be salient over time and in the different contexts (e.g., countries, parities) in which the survey is conducted. The risks of drawing on existing research as the source of potentially salient items are twofold: First, without asking the decision makers themselves, important issues might be excluded, and second, some of the issues raised may address beliefs that are actually not readily accessible in the research population. Nevertheless, despite these limitations, we have seen that application of the TPB in large-scale population surveys can provide very useful information about child-bearing decisions.

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Appendix

Effects of attitudes, subjective norms and perceived behavioral control on intention to have a child during the next three years, 25 to 34 year olds with a resident partner and one child in five countries

Country	Attitude		Subject norm		Perceived control	
	Mean	SD	Mean	SD	Mean	SD
Russia	0.48	0.06	0.13	0.02	0.09	0.03
Italy	0.42	0.08	0.07	0.04	0.04	0.03
Germany	0.78	0.17	0.22	0.03	0.09	0.06
France	0.66	0.13	0.06	0.04	0.31	0.06
Hungary	0.98	0.11	0.09	0.02	0.03	0.05

Note: Mean (unstandardized) regression weights and standard deviation (SD) for the model presented in Table 1. Values in bold are statistically significant at 0.05 or less.