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FERTILITY DESIRES, INTENTIONS AND BEHAVIOUR: A COMPARATIVE ANALYSIS OF THEIR CONSISTENCY

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Abstract

Realisation of childbearing intentions implies couple's dyadic interaction and proceptive behaviour. Studies on childbearing intentions and outcomes have rarely considered non-use of contraception or 'proceptive behaviour' in general as an important mediator of fertility outcomes. The traits-desires-intentions-behaviour theory (Miller and Pasta, 1996; Miller et al., 2004; Miller, 2010) expects proceptive behaviour to be the most accurate predictor of a birth and intentions to be more predictive than desires. We test this theory using longitudinal data from the Generations and Gender Surveys from Austria, France and Bulgaria (2004–2013) and performing logistic regression models on birth outcomes which includes as key explanatory variables different pairwise combinations of desires, intentions and contraceptive (or proceptive) behaviour. The findings show that an individual's intention to have a child predicts the birth of a child better than non-use of contraception, or proceptive behaviour; however, proceptive behaviour is a better predictor of a birth than non-use of contraception. Finally, perception of the partner's agreement on having a child now is less predictive than an individual's intention to have a child within three years. This paper calls for the collection of genuine couple-level data on fertility intentions and behaviour and more refined measures on both contraceptive and proceptive behaviour.

Keywords

Fertility, fertility desires, fertility intentions, proceptive behaviour, contraceptive behaviour.

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Fertility Desires, Intentions and Behaviour: A Comparative Analysis of Their Consistency

Rita Freitas and Maria Rita Testa

1. Introduction

In this paper, we make a comparative analysis on the consistency of desires, intentions, contraceptive behaviour and proceptive behaviour, i.e. "instrumental behaviour in which the goal is to achieve conception" (Miller, 1986), on predicting fertility outcomes, using individual-level longitudinal data.

Theories on fertility intentions, particularly the theory of planned behaviour (TPB) (Ajzen, 1991) and the theory of traits-desires-intentions-behaviour (TDIB) (Miller, 1986 and 1994), consider that fertility intentions are the proximate determinants of reproductive behaviour. The latter theory was reformulated in recent years to consider the dyadic nature of reproduction and therefore incorporate both partners' motivations and the conception-oriented conjoint behaviour (Miller and Pasta, 1996; Miller et al., 2004; Miller, 2010). According to the TDIB sequence, one's own and the partner's perceived fertility desires are the main source of individuals' fertility intentions, which are closer to explain a subsequent reproductive behaviour. Moreover, this theory assumes that there is a clear link between couple's contraceptive or proceptive behaviour and a fertility outcome.

Although the importance of studying fertility decision-making in a couple's perspective is well documented (Miller and Pasta, 1996; Thomson, 1997; Thomson and Hoem, 1998; Miller et al., 2004; Testa, 2010; Testa, 2012; Testa et al., 2014; Miller et al., 2016), few studies incorporate the role of couple's contraceptive or proceptive behaviour in models predicting birth outcomes. This is partly due to difficulties in measuring couple's contraceptive behaviour, both for the methods and the timing of usage. Some surveys collect information on specific contraceptive methods used at a certain time (normally, at the time of the interview), but little is known about couple's contraceptive behaviour in a broader temporal perspective.

According to the TDIB sequence, proceptive behaviour should be a more accurate predictor of a birth than non-use of contraception since the former—other than the latter—is explicitly aimed at reaching a pregnancy. Moreover, fertility intentions are supposed to be more predictive than fertility desires because they include a component of commitment in the wish for a child. We analyse partners' combined fertility desires by measuring a respondent's perception of agreement with the partner about wanting to have a/another child now; fertility intentions by measuring individual intentions to have a/another child within three years; contraceptive behaviour was captured by asking respondents about the couple's contraceptive method used at the time of the first

interview; and proceptive behaviour was measured by asking respondents if they were trying to have a child at the time of the first interview. The analysis is based on a longitudinal sample of 8,314 individuals (men and women) from Austria, Bulgaria and France, obtained from the Generations and Gender Survey. The three countries have been selected because they have different fertility levels, family policies and welfare regimes.

In the following section we outline the literature on couples' fertility decision-making, next we describe the research hypotheses. In Section 4, we present data, measures and methodology and, in Section 5, the results of the statistical analysis. We conclude with some remarks on the findings of the study (Section 6).

2. Couples Context in Fertility Decision-Making

Unlike other common theories used in the field of fertility intentions, like the TPB (Ajzen, 1991) and the theory of conjunctural action (Johnson-Hanks et al., 2011), the traits-desires-intentions-behaviour theory (Miller, 1986 and 1994) explicitly considers the dyadic nature of reproduction. The authors propose a model that demonstrates how positive and negative childbearing motivational traits lead into conscious desires and how the combination of one's desires and the partner's perceived desires are transformed via intentions into the conception-oriented conjoint behaviour.

The TDIB sequence first considers motivational traits, which are conceptualised as "latent dispositions to be positively or negatively motivated towards fertility related experiences" (Miller, 2010, p. 3), including pregnancy and birth, childcare and child rearing as well as interaction with one's partner, family and friends. According to the TDIB, motivational traits are the main source of childbearing desires (Miller, 1994). Whether these motivational traits involve positive or negative feelings, the desires into which they are activated are more oriented to the decision-making process and represent what the individual would like to do about having or not having a child. However, desires do not lead directly to the behaviour of having a child. Instead, they are the major source of childbearing intentions, which represent what the individual actually plans to do at some future time. According to Miller at al. (2004), all fertility desires have their corresponding intentions and the difference between desires and intentions is connected to the differences between what one would like to do given no constraints and what one actually plans to do given reality constraints.

Nevertheless, the TDIB considers not only individual desires and intentions, but also takes into account the partner's desires. Despite motivations-desires-intentions all exist separately within each member of the dyad, when the focus is on couples, their behaviour is best described as conjoint (Miller et al., 2004; Miller, 2010). Therefore, the TDIB framework combines a TDIB sequence of each individual with the perceived TDIB components of his or her partner, leading the two partners into one model. According to Miller et al. (2004), having information about one's partner's perceived desires and combining it with the individual's desires allows one to model the movement of motivation throughout the paths that lead to couple's behaviour. Since the interaction

between partners is considered at each stage of the TDIB sequence, the perception of the partner's desires is considered crucial to the individual construction of the following steps of the motivational structure. The strength of this motivational structure involves a combination of one's own and one's partner's motivations.

The implementation of intentions of having (or not having) a child requires a translation of motivational dimensions into behaviour. Thus, reproductive behaviour can be designed to achieve (proceptive) or prevent (contraceptive) pregnancy. Proceptive behaviour has two forms: passive proceptive behaviour, characterised by the initiation of unprotected sexual intercourse with the intent to conceive; and active proceptive behaviour, characterised by efforts to increase the chances of conception. On the other hand, contraceptive behaviour is designed to avoid conception by using a variety of hormonal, mechanical and behavioural methods. According to Miller (2010), the two types of conception-oriented behaviours tend not to be present in the same individual at the same time as far as intentions are concerned, but in the case of desires it may happen that someone dithers between these two behaviours during a short time interval. Moreover, both proception and contraception require an effort, which means that the intensity of an intention may get dissipated between the behavioural intention and the action itself. For example, the need for behavioural consistency in order to conceive can become a disincentive and therefore weaken a previous strong intention. By contrast, factors like having a partner with strong intentions can strengthen the conception-related behaviour even in the face of a relatively weak intention. Hence, the implementation of fertility intentions is determined by the way in which partners' intentions interact with each other and the degree to which each partner's behaviour is synchronised in joint action (Miller and Pasta, 1996).

According to Miller et al. (2004), modelling reproductive behaviour is most relevant in the context of stable intimate relationships, because it is most likely that in such contexts partners share more information about their confidence and satisfaction in their jointly chosen contraceptive method. However, it is recognised that discrepancies can still occur between one's own and the partner's contraceptive or proceptive behaviour (Miller and Pasta, 1996). In reality, these discrepancies may lead partners to a separate, rather than a joint action towards a specific goal. Hence, when focusing on the last steps of the TDIB sequence, the implementation of an intention in forms of contraceptive behaviour may not be free of disturbances.

Despite the clear link between a couple's contraceptive behaviour and fertility outcomes, it is important to consider a degree of uncertainty in the reports about such behaviours. First, we highlight that when dealing with data that consider only respondent's reports about the couple's contraceptive behaviour, discrepancies may occur between that report and the actual behaviour, especially if there is disagreement between partners about child-timing intentions (Miller and Pasta, 1996). Another problem arises when capturing contraceptive behaviour: since most data collections are focused on the "current" contraceptive use and do not take into account the effect of continuing (discontinuing) or switching methods, it is not clear how to capture a contraceptive behaviour that could better predict a fertility outcome, one with as few disturbances as

possible. According to Blanc et al. (2002), contraceptive discontinuation is associated not only with individual motivations but also with quality of services. One can interrupt contraception use not only to achieve pregnancy but for reasons related to improvement in the family planning program. Thus, it can happen that someone who reports not to be currently using any contraceptive method is just in-between methods and actually does not intend to have a child.

3. Research Hypotheses

In the TDIB theory, fertility intentions predict birth outcomes better than desires. Hence, we hypothesise that *those who report an intention to have a/another child within three years are more likely to have a child than those who perceive an agreement with their partner about wanting to have a/another child now* (**Hypothesis 1a**). In the TDIB theory a couple's proceptive behaviour (as well as non-use of contraception) predicts a birth better than individual birth intentions. Therefore, we expect that *those who are proceptive or do not use contraception are more likely to have a child than those who intend to have a/another child within three years* (**Hypothesis 1b**).

Couple agreement about wanting a child influences the strength of both partners' intentions (Miller and Pasta, 1996; Testa, 2012). Thus, we hypothesise that *those who perceive an agreement with partner about wanting to have a/another child now and also intend to have a/another child within three years are more likely to have a child than those who, despite having a positive intention, perceive a disagreement with partner* (**Hypothesis 2a**). Similarly, we expect that *those who perceive an agreement on not wanting to have a/another child now and also do not intend to have a/another child within three years are more likely to realise their negative intentions than those who, despite not intending to have a child, perceive a disagreement with partner* (**Hypothesis 2b**).

Considering that the implementation of fertility motivations is determined by the partners' interaction and the extent to which each partner's behaviour is synchronised in a joint action (Miller and Pasta, 1996), we suppose that a couple's contraceptive behaviour improves the accuracy of partners' fertility desires on predicting a birth outcome. Hence, we hypothesise that *those who are not using contraception and perceive an agreement with their partner on wanting to have a/another child now are more likely to have a child than those who, despite perceiving an agreement on wanting a child, are using contraception* (**Hypothesis 3a**). Moreover, since the implementation of fertility intentions also depends on the couple's conception-oriented behaviour (Miller, 2010), we expect that *those who intend to have a/another child within three years and do not use contraception are more likely to have a child than those who, despite having a positive intention, are using contraception* (**Hypothesis 3b**). Moreover, we hypothesise that *those with positive short-term fertility intentions and proceptive behaviour are more likely to have a child than those who have positive intentions and are not proceptive* (**Hypothesis 3c**). Finally, since proceptive behaviour is the closest predictor of a birth outcome (Miller et al., 2004), we expect that *proceptive behaviour predicts the birth of a child more precisely than non-use of contraception* (**Hypothesis 4**).

4. Data and Methods

4.1. Data Sample

We used the longitudinal Generations and Gender Surveys for Austria, Bulgaria and France, conducted between 2004 and 2013 (Austria: 2008 to 2013; Bulgaria: 2004 to 2007; France: 2005 to 2008). The whole sample included 19,783 panel respondents, men and women, aged 18-83. We restricted the analysis to heterosexual and non-sterilised couples in which the female partner was not older than 49 at the time of the first interview. Moreover, we selected only respondents who answered the question about short-time fertility intentions and both questions about their own and their partner's perceived fertility desires (share of non-response was 16% but was not biased by socio-demographic characteristics such as age, gender, marital status and education). This selection left us with a target sample of 2,458 respondents for Austria, 3,407 for Bulgaria and 2,449 for France.

4.2. Desires, Intentions, Contraceptive Behaviour and Proceptive Behaviour

Couple agreement or disagreement about having a child was measured by the respondent's own intentions and his/her perception of agreement with partner. Hence, we combined the information about the respondent's own fertility desires (*Do you yourself want to have a/another child now?*) and their perception of the partner's fertility desires (*Does your partner want to have a/another child now?*). For Austria and Bulgaria, to answer about their own fertility desires, respondents were given a choice between *yes*, *no* and *not sure*, and when answering about the partner's desires the third option was: *partner not sure*. We combined the information of both variables into four categories: 1) respondents who did not want to have a/another child and perceived that the partner also did not (*R no, believes P no*); 2) respondents who did not want to have a/another child or were unsure but perceived that their partner did (*R no or not sure, believes P yes*); 3) respondents who wanted to have a/another child but perceived that the partner did not or was unsure (*R yes, believes P no or not sure*); 4) respondents who wanted to have a/another child and perceived that the partner did so as well (*R yes, believes P yes*). The four categories mentioned above reflect *agreement on not wanting a child*, *negative disagreement*, *positive disagreement* and *agreement on wanting a child*. A similar approach has been used in previous studies (Testa, 2012).

In the case of France, instead of asking respondents about their own fertility desires, the following question was provided: *Are you currently trying to have a child?* To answer this question, respondents could select one of the following options: *yes*, *not currently* and *not now nor later*. Since we are interested in respondents who at the time of the first interview had a partner, we can assume that if someone was "currently" trying to have a child it is very likely that they were trying with their partner and with his or her knowledge and consent. In addition, in this scenario it would be expected that none of the members of the dyad were using contraception. Actually, the marginal share (0.3%) of respondents who reported to be currently trying to have a child and were using

contraception proves exactly that (Table 1). However, we cannot assume that this question is measuring a desire since one who is currently trying to have a/another child is likely to be at least a step further in wishing to have it. Moreover, according to the TDIB sequence, it can be expected that these respondents had a previous positive desire and intention and are actually closer to taking actions towards proceptive behaviour or even already committed to taking such actions. Hence, we used the variable *currently trying to have a child* as a proxy of proceptive behaviour. We measured the variable *proceptive behaviour* as a dummy with the two categories: *yes* and *no*, with the *no* category offering the options *not currently* and *not now, nor later*.

Short-time fertility intentions were measured through the following question: *Do you intend to have a/another child during the next three years?* Respondents were asked to choose one of the four options: *definitely not*, *probably not*, *probably yes* and *definitely yes*. For the sake of simplicity, we considered *positive intentions* regardless of the certainty (*definitely*) or uncertainty (*probably*) about such intentions. Analogously, *negative intentions* refer to both those who definitely or probably did not intend to have a/another child within three years.

Contraceptive behaviour was captured through the question: *Are you or your partner/spouse using or doing anything to prevent pregnancy at this time?* Respondents were asked to name all of the things listed in a card which they were using or practising at the time of the first interview. Considering this information, we aggregated contraceptive behaviour into the following three categories: 1) *safer methods*, which includes condoms, pills, ultra-uterine device (coil, loop), injectable (e.g. Depro-Provera), implants (e.g. Norplant) and hormonal emergency contraception afterwards ("morning-after pill"); 2) *natural*, in which we considered withdrawal, safe period method, PERSONA, diaphragm, spermicidal cream and others; 3) *none*.

In some of the regression models intentions, or desires, are combined with proceptive (or contraceptive) behaviour with the aim to discriminate between respondents who intend (or desire) to have a child and those who are (presumably) already taking actions towards reaching a pregnancy (Scheme 1). For the sake of simplicity, in this specific analysis we aggregated positive and negative disagreement in one category (*one of the partners doesn't want)*, just as we did with positive and negative uncertainty (*probably yes and probably not*). Contraceptive behaviour was measured by the two categories: *use* and *non-use*. The univariate distribution of each of these variables as well as their combination and the background socio-demographic variables included in the regression models is reported in Table 1.

Scheme 1: Combination of desires, or intentions, with contraceptive behaviour

Desires	**Contraceptive behaviour**	
	Use	*Non-use*
R no, believes P no	*Both no + use*	*Both no + non-use*
R no, P yes; R yes, P no	*One doesn't + use*	*One doesn't + non-use*
R yes, believes P yes	*Both yes + use*	*Both yes + non-use*
Intentions	**Contraceptive behaviour**	
	Use	*Non-use*
Definitely not	*D not + use*	*D not + non-use*
Probably not; Probably yes	*P + use*	*P + non-use*
Definitely yes	*D yes + use*	*D yes + non-use*
Intentions	**Proceptive behaviour** [1)]	
	No	*Yes*
Definitely not	*D not + no*	-
Probably not; Probably yes	*P + no*	-
Definitely yes	*D yes + no*	*D yes + yes*

[1)] None of respondents with a negative short-term fertility intention (*definitely not*) or uncertain about their fertility intentions (*probably*), reported to be proceptive at the time of the first interview.

Table 1: Distribution of variables used in the regression analysis (in per cent)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Total (N)	919	1539	362	3045	653	1796
Had a child within the inter-survey period?						
No	72	84	73	94	70	88
Yes	28	16	27	6	30	12
Perception of agreement with partner about wanting a/another child now						
R no, believes P no	74	80	24	80	-	-
R no or not sure, believes P yes	4	5	7	6	-	-
R yes, believes P no or not sure	7	5	15	4	-	-
R yes, believes P yes	15	10	54	10	-	-
Intention to have a child within three years						
Definitely not	27	61	16	77	32	76
Probably not	24	17	10	10	17	4
Probably yes	25	12	39	9	22	9
Definitely yes	24	10	35	4	29	11
Contraceptive behaviour						
Safer methods	76	71	48	38	78	81
Natural methods	2	4	10	32	1	3
None	22	25	42	30	21	16
Proceptive behaviour						
No	-	-	-	-	88	95
Yes	-	-	-	-	12	5
Fertility desires & contraceptive behaviour						
Both no + use	66	64	21	58	-	-
Both no + non-use	8	16	3	22	-	-
One doesn't + use	9	7	17	7	-	-
One doesn't + non-use	2	3	5	3	-	-
Both yes + use	4	3	20	5	-	-
Both yes + non-use	11	7	34	5	-	-
Fertility intentions & contraceptive behaviour						
D not + use	24	50	14	56	27	67
D not + non-use	3	11	2	21	5	10
P + use	43	19	32	12	36	11
P + non-use	6	9	17	7	2	1
D yes + use	12	5	12	2	16	5
D yes + non-use	12	6	23	2	14	5
Fertility intentions & proceptive behaviour						
D not + no	-	-	-	-	32	76
P + no	-	-	-	-	39	13
D yes + no	-	-	-	-	18	6
D yes + yes	-	-	-	-	12	5
Background variables						
Women	54	64	51	61	59	55
Men	46	36	49	39	41	45
Age of women (mean, sd)	28.0	35.9	27.2	36.0	27.9	38.1
	(7.0)	(5.9)	(7.1)	(7.0)	(7.6)	(6.3)
Age of men (mean, sd)	30.6	38.9	29.9	39.5	30.3	41.0
	(8.2)	(6.8)	(7.7)	(7.4)	(9.2)	(7.6)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Table 1 (Continued)						
Women with low education	10	15	17	23	16	25
Women with medium education	67	70	54	54	34	40
Women with high education	23	15	29	23	50	35
Men with low education	7	8	15	23	20	22
Men with medium education	71	70	64	62	37	48
Men with high education	22	22	21	15	43	30
Women employed	75	84	55	72	64	80
Women not employed	6	15	26	28	12	20
Women enrolled in education	19	1	19	0.2	24	0.4
Men employed	82	95	69	75	76	92
Men not employed	7	4	23	25	10	8
Men enrolled in education	11	0.5	8	0.1	14	0.2
Married	18	77	25	89	16	72
Co-resident partner	33	18	26	10	38	22
Non-resident partner	49	5	49	1	46	6
Union duration: up to 3 years	59	11	62	6	66	11
Union duration: more than 3 years	41	89	38	94	34	89
Years last birth: up to 3 years	-	39	-	22	-	34
Years last birth: more than 3 years	-	61	-	78	-	66
Stepchildren: none	94	94	95	97	95	91
Stepchildren: woman's	4	5	1	2	3	5
Stepchildren: man's	2	1	4	1	2	4
Number of children: one	-	34	-	33	-	23
Number of children: 2 or more	-	66	-	67	-	77

4.3. Models

We used logistic regression models (Hosmer and Lemeshow, 2013) to analyse the determinants of having a child within the inter-survey period. The response variable is 0 if no child was born within the inter-survey period and 1 if a child was born within the inter-survey period. The latter category includes also respondents who were pregnant at the time of the second interview or had a partner who was pregnant (wave 2). To compute the response variable we used the dates of birth of all biological children living or not living in the household at the second wave of the survey: if one was higher than the date of the first interview, a new child was assumed to be born.

To run logistic regression models we used the R Project software (R Core Team, 2013) and followed the strategy outlined by Hosmer and Lemeshow (2013). We tested the significance of the variables and interactions by using the Wald test and the likelihood-ratio test. The model's quality of adjustment was evaluated by the Hosmer and Lemeshow goodness-of-fit test and the Nagelkerke R^2; the discriminative capacity was assessed by the AUC (area under the curve) value of the ROC (receiver operating characteristic) curve.

The length of the inter-survey period differs in the three countries analysed: it is between three to five years for Austria and three years for Bulgaria and France. It can be

expected that a longer time frame between interviews increases the chances of having a/another child within the inter-survey period. Hence, we first considered dropping Austrian interviews conducted within more than three years. However, this selection would have left us with only 327 respondents. Therefore, instead of cutting the Austrian sample, we tested if the chances of having a/another child within the inter-survey period significantly increased for those who were re-interviewed 4 and 5 years later in comparison to those who were re-interviewed within only 3 years. Hence, we first created a dummy variable for the period between interviews: 0 = *interviews conducted within 3 years*, 1 = *interviews conducted within more than 3 years*. Then, for all the models, we used the Wald test and the likelihood-ratio test to certify that the dummy variable was not significant and that no significant interactions were found between the time of interview and fertility desires or intentions. Not only did we not find any significant evidence that the longer period between interviews increased the chances of having a child, but also no significant interactions between desires/intentions and the time-frame. This analysis led us to conclude that there is no evidence that one or two more years between interviews will significantly increase the chances of having a child. Therefore, we considered all respondents of Austria's sample.

We ran several different models, controlling for the same set of background variables. Due to the limited number of observations, in some of the models we aggregated two categories of one variable: *married vs. partnered*, *employed vs. unemployed* and *none vs. at least one*. The aggregated categories had the same effect on the response variable and no significant differences were found in the goodness of fit of the models with the aggregated categories and the models with the disaggregated categories.

Since the determinants of fertility vary between those who have already made the transition to parenthood and those who are still without children, regression models are stratified by parity (Namboodiri, 1972).

5. Results

5.1. Childbearing Contexts of Austria, Bulgaria and France

France has one of the highest TFR in Europe. According to Eurostat, in 2014 the average number of children per woman was slightly above the threshold of the generation replacement level (2.1 children per woman). However, in Austria and Bulgaria this indicator is considerably lower: 1.47 in Austria and 1.53 in Bulgaria (Figure 1a).

Besides having fewer children, Austrian women have been postponing the birth of the first child since the mid-1970s (Buber et al., 2012) and, in 2014, the average age of women at birth of first child reached the level of 28.9 (Figure 1a), making Austria one of the European countries characterised by a postponement in family formation. In 2004, the average age at which Austrian women had their first child was 1.4 years lower than the mean age of French women. However, while France more or less maintained the same average in 2014 (28.3), Austrian levels kept rising and within 10 years there was an

increase of almost two years in the mean age of women at birth of first child from 27.0 in 2004 to 28.9 years in 2014.

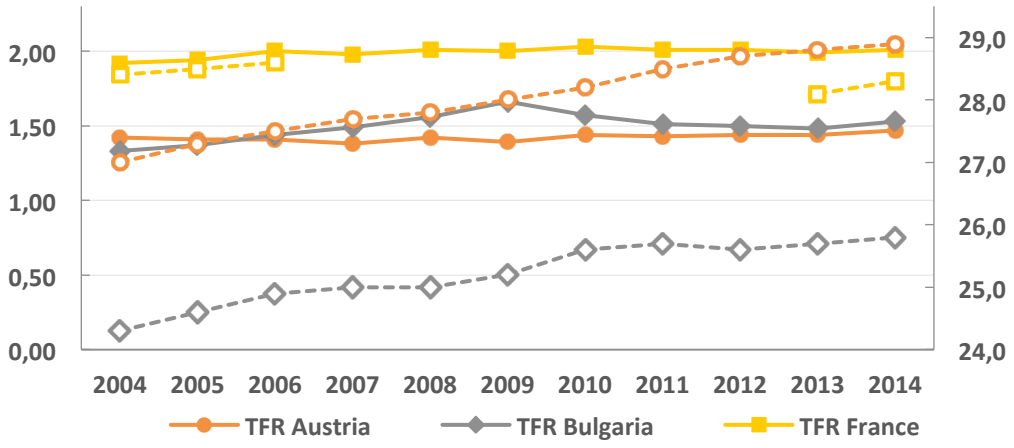
Despite the low TFR observed in Bulgaria during the past decade (around 1.5), this country clearly distinguishes itself from Austria and France when comparing the mean age of women at birth of first child. Bulgaria has traditionally been a country in which the birth of first child happened at a very early age compared to Western countries (Koytcheva and Philipov, 2008). Until the beginning of the 1990s, the mean age of women at birth of first child remained at around 22, but in the past two decades this indicator has increased to the level of 25.8 (Figure 1a). This indicator is still lower than the levels observed in 2014 for France and Austria.

Another important change in fertility trends of the analysed countries is the substantial increase of non-marital births (Figure 1b). The latest data show that the proportion of non-marital births reached 58.8% in Bulgaria in 2014 and 56.7% in France in 2012. Despite Austria's long tradition of non-marital births (Buber et al., 2012), the proportion of births outside marriage in 2012 was still below 45%.

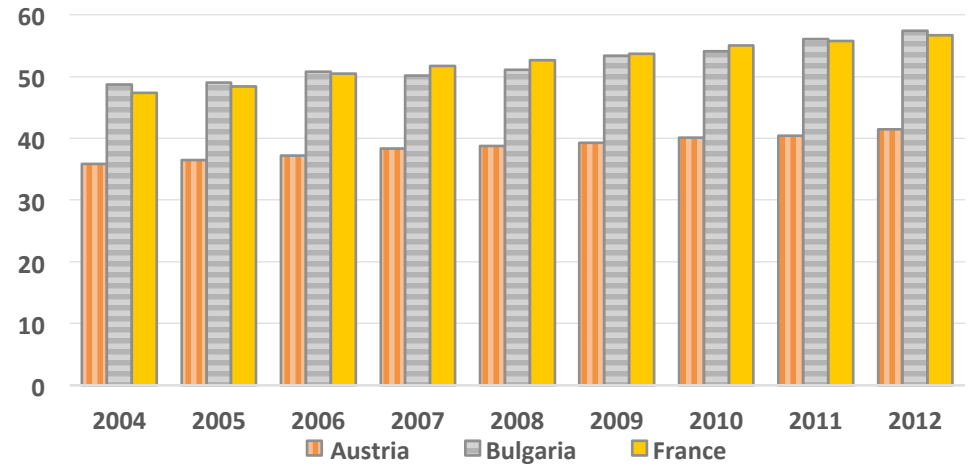
According to the data of the longitudinal Generations and Gender Survey, in 2004 (wave 1) the majority of Bulgarian respondents (or his/her partner) were using more traditional means of contraception. In fact, the majority of these individuals were using natural contraceptive methods or no contraception at all: 52% among childless respondents and 62% among parent respondents (Table 1, Section 4.2). Hence, Bulgaria clearly differs from Austria and France when it comes to contraceptive behaviour. For the Austrian and French data (wave 1: 2008 and 2005, respectively) we concluded that the large majority of respondents, whether childless or parents, were using contraception, particularly safer methods (Table 1, Section 4.2).

Figure 1: Total fertility rate and female mean age at birth of first child (panel a) and share of live births outside marriage (panel b), by year and country

(a)



(b)



Source: Eurostat, 2016. Data for mean age of women at birth of first child was not available for France between 2007 and 2012 (Figure 1a). The proportion of live births outside the marriage after 2012 was only available for Bulgaria; however, this information was not included in Figure 1b.

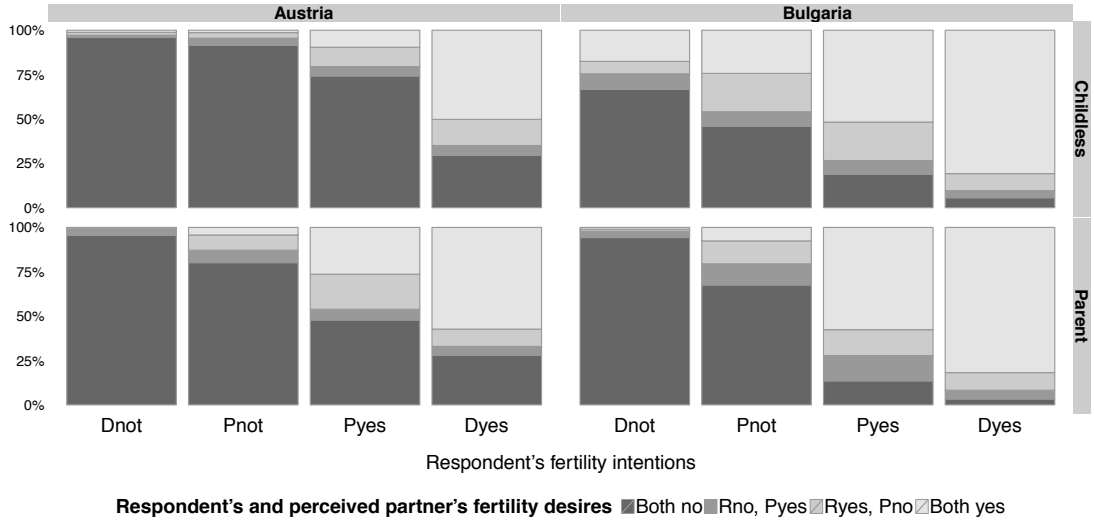
5.2. Descriptive Analysis

The share of Austrian and Bulgarian respondents who perceive their partner's agreement on wanting a/another child gradually increases from a negative to a positive certainty of fertility intentions (*definitely not* to *definitely yes*). By contrast, the share of a perceived agreement on not wanting a/another child decreases with the strengthening of positive fertility intentions. Most of the Austrians and Bulgarians who definitely did not intend to have a child also perceived an agreement with their partner about not wanting that child. The highest share of this concordance is observed among childless Austrians (96%) and the lowest among childless Bulgarians (67%). A higher concordance between positive birth intentions and an agreement on wanting a/another child occurs in Bulgaria. Particularly, for those who are more certain of their positive intentions (*definitely yes*): 81% and 82% among childless individuals and parents, respectively (Figure 2). In Bulgaria there is more consistency between respondents' positive fertility intentions and their perception of agreement with their partners on wanting to have a/another child. In Austria we find higher consistency between fertility intentions and fertility desires among those who have negative intentions and perceive their partner's agreement on not wanting a/another child.

Uncertainty about short-term fertility intentions (*probably not* and *probably yes*), seems to be more common among those who perceive their partner's disagreement in wanting a/nother child (*R no, P yes* and *R yes, P no*) (Figure 2). Overall, 16% of Austrian respondents who are uncertain of their short-term fertility intentions also perceive a disagreement on wanting a/another child (12% and 20% among childless individuals and parents, respectively). This share of disagreement is higher in Bulgaria: 27% (30% and 27% among childless individuals and parents, respectively).

The share of those who had a child within the inter-survey period varies significantly through different fertility intentions: from the certainty of a negative intention to the certainty of a positive intention. The consistency between short-term fertility intentions and subsequent births is undoubtedly higher for those who did not intend to have a child within three years than for those who did: 96% of the individuals who did not intend a/another child (*definitely* and *probably*) in fact had none in the end, in all countries and at all parities; while only about one-half of the Austrian and French individuals who did intend to have a/another child (*definitely* and *probably*) ended up having one. In Bulgaria, only 30% of the individuals who expressed a birth intention realised it in the subsequent short-term period (Figure 3a).

Figure 2: Couple agreement about wanting a/another child by fertility intentions



Source: Generations and Gender Surveys, 2004–2013.

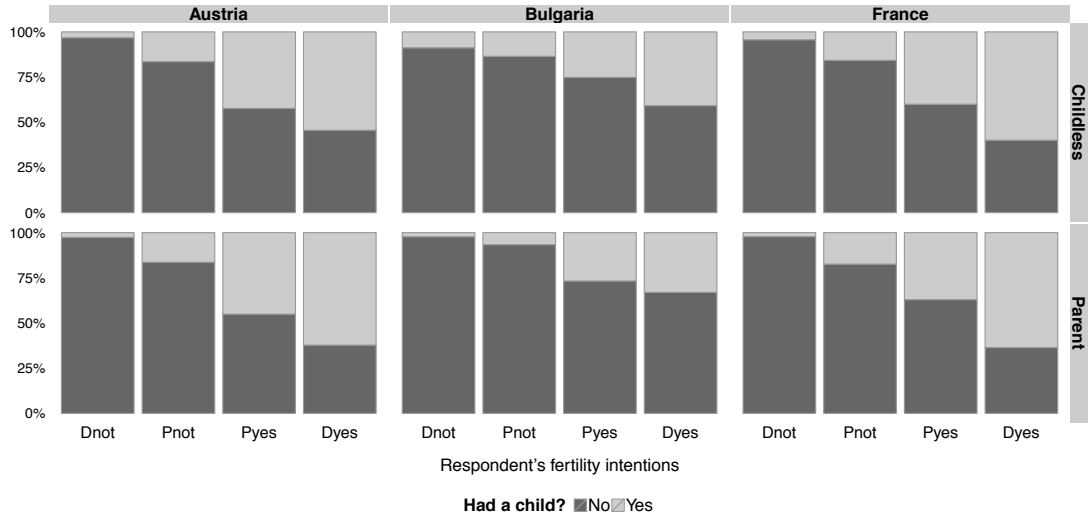
The consistency between birth desires and birth outcomes is higher in the presence of a negative agreement (*both no*) than for a positive agreement (*both yes*). At least 80% of those individuals who did not want do have a/another child and perceived their partner's agreement had no child, while only 29% and 58% of those who wanted a/nother child and perceived their partner's agreement in fact had one in the subsequent short-term period in Bulgaria and in Austria, respectively. Negative disagreement (respondent does not want but perceives that the partner does) seems to be more predictive of a birth than positive disagreement (respondent wants but perceives that the partner does not). An exception is given by Austrian parents among which a higher share of births occurred among those who perceived a positive disagreement than among those who perceived a negative disagreement (Figure 3b).

The proportion of births tends to be higher among those individuals who reported not to be using any kind of contraceptive method at the time of the first interview. In Bulgaria the proportion of births does not change across parents using different contraceptive

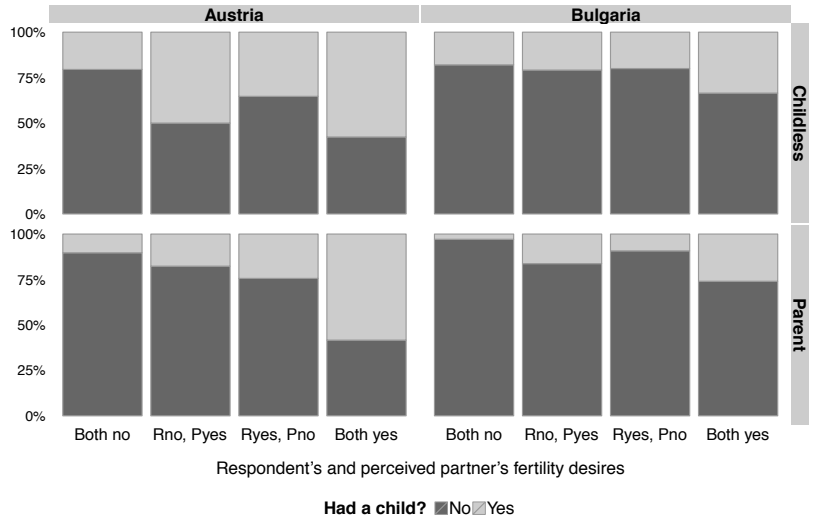
methods (Figure 3c). The French data show that proceptive behaviour is definitely a better predictor of a birth than a non-use of contraceptives, especially among parents (Figure 3d).

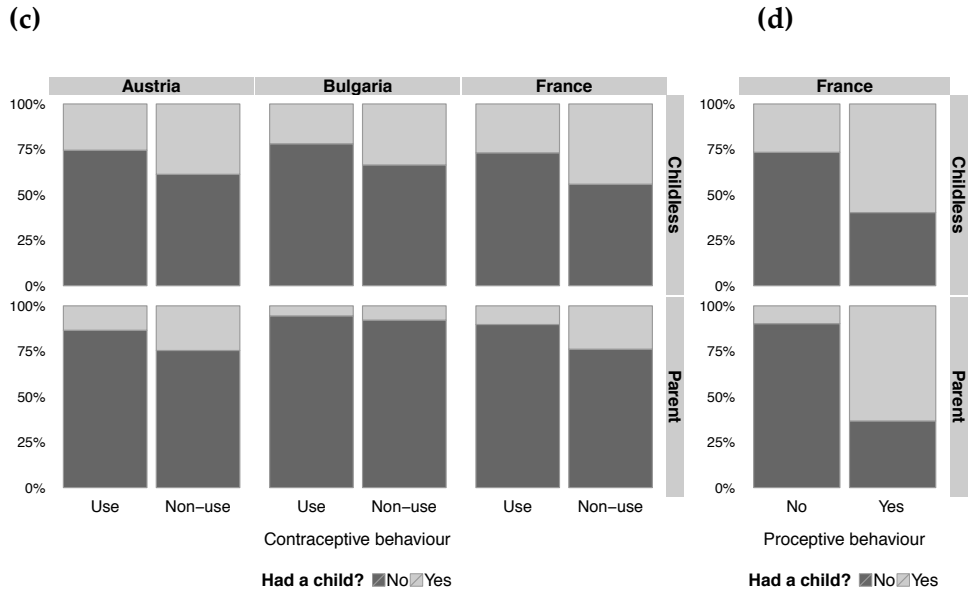
Figure 3: Share of individuals who had a child in the inter-survey period by fertility intentions (panel a), by couple's agreement/disagreement about wanting a/another child (panel b), by couple's contraceptive behaviour (panel c), by couple's proceptive behaviour (panel d)

(a)



(b)





Source: Generations and Gender Surveys, 2004–2013.

5.3. Multivariate Analysis

5.3.1. Socio-Demographic Determinants of Having A Child

The chance to realise the transition to parenthood is negatively correlated with age, enrolment in education and lack of a resident partner while it is positively associated with woman's higher educational attainment in Austria and France. Unmarried partners, whether cohabiting or not, have a lower chance to realise the transition to a first child than married couples in all three countries. In France this is true also for the transition to a second or higher birth order child. The likelihood to have a second or additional child also decreases with age, especially among women, with the years elapsed since the previous birth and with the number of children already born. In Austria and France, the chances of having a child increase for women with higher education and for those in relationships shorter than three years. For French parents, having an additional child increases among women not active in the labour market. In Bulgaria, men with lower education levels are more likely to have another child than those with higher educational level; moreover, differently from Austria and France, union duration is positively associated with the chance of having an additional child.

Table 2: Logistic regression models on having a child in the inter-survey period (Beta coefficients of socio-demographic variables)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Gender (ref. Woman)						
Man	-0.11	0.11	-0.30	-0.02	0.03	-0.18
Age of woman	-0.06 **	-0.13 ***	-0.04	-0.11 ***	-0.06 *	-0.15 ***
Age of man	-0.03	-0.05 *	-0.07 *	-0.06 *	-0.04	-0.05 *
Education of woman (ref. Medium education)						
Low	-0.39	-0.11	-0.01	0.05	-0.14	0.51
High	0.41 **	0.52 *	0.25	0.15	0.92 ***	0.55 *
Education of man (ref. Medium education)						
Low	0.18	-0.23	-0.55	0.63 *	-0.29	-0.09
High	0.38	0.40	0.69	0.30	-0.24	0.22
Employment status of woman (ref. Employed) [1]						
Not employed	-0.48	-0.15	0.28	0.14	-0.43	0.44 *
Enrolled in education	-1.21 ***		-0.37		-1.48 ***	
Employment status of man (ref. Employed) [1]						
Not employed	0.05	0.21	0.29	0.20	0.06	0.46
Enrolled in education	-1.04 **		-0.41		-1.03 *	
Partnership status (ref. Married) [1]						
Co-resident partner	-0.31	-0.34	-0.48	-0.37	-0.71 **	-0.94 ***
Non-resident partner	-1.27 ***		-1.38 ***		-1.61 ***	
Union duration (ref. Up to 3 years)						
More than 3 years	0.02	-0.58 *	-0.07	0.68 **	0.11	-0.88 **
Years elapsed since last birth (ref. Up to 3 years)						
More than 3 years	-	-1.07 ***	-	-0.44 *	-	-1.02 ***
Existence of stepchildren (ref. None)						
At least one	-0.62	0.44	-0.25	0.83	-0.18	-0.56
Number of children (ref. One)						
Two or more	-	-0.96 ***	-	-1.48 ***	-	-1.39 ***

[1] Due to the reduced number of observations, for parent respondents we aggregated the employment status of woman and man as well as the partnership status as follows: *employed vs. unemployed* and *married vs. partnered*.

* p<0.05; ** p<0.01; *** p<0.001.

5.3.2. Motivational Determinants of Having a Child

In the first stage of the multivariate analysis, we estimated separate models including either partners' combined fertility desires, individuals' short-term fertility intentions, or a couple's contraceptive behaviour and proceptive behaviour (Model I to IV in Table 3).

Results show that those who perceive an agreement on wanting a/another child as well as those who perceive a disagreement (whether positive or negative) are more likely to have a child than those who perceive an agreement on not wanting. In Bulgaria the coefficients of partners' combined fertility desires are positive but not statistically significant for childless respondents. Moreover, quite surprisingly, a negative disagreement predicts a subsequent birth more precisely than a positive disagreement among Bulgarian parents. As for Austrian childless respondents, we find that there are no

significant differences between the effect of negative and positive disagreement (p-value = 0.48).

For all countries and parities having a child is positively correlated with fertility intentions and the effect increases monotonically from a negative uncertainty (probably not) to a positive certainty (definitively yes) (Model II). In Austria birth intentions predict birth outcomes better if they refer to the first child, in Bulgaria and France birth intentions are a more accurate predictor of birth outcomes if they concern a second or higher birth order.

The non-use of contraception increases the chances of having a child in the inter-survey period for all countries and parities (Model III). Quite surprisingly, for Austrian parents the estimated coefficient for natural methods (1.22) is higher than the coefficient for non-use of contraception (0.88). However, the two coefficients do not differ significantly (p-value = 0.40). In Bulgaria non-use of contraception and use of natural methods have an effect of the same magnitude on the chance of a second or higher birth order child (0.44). Finally, being proceptive is positively correlated with a subsequent birth in France (Model IV).

Table 3: Logistic regression models on having a child in the inter-survey period (Beta coefficients of motivational variables)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Model I						
Perception of agreement with partner about wanting a/another child now (ref. R no, believes P no)						
R no or not sure, believes P yes	1.18**	0.29	0.04	1.02***	-	-
R yes, believes P no or not sure	0.85**	0.85**	0.44	0.41	-	-
R yes, believes P yes	1.69***	2.19***	0.70	1.23***	-	-
Model II						
Intention to have a child within three years (ref. Definitely not)						
Probably not	1.60***	1.35***	0.43	0.33	0.86	1.19**
Probably yes	2.86***	2.69***	1.23*	1.64***	2.04***	2.11***
Definitely yes	3.31***	3.30***	1.76**	1.88***	2.90***	3.52***
Model III						
Contraceptive behaviour (ref. Safer methods)						
Natural methods	0.29	1.22**	0.38	0.44*	0.99	0.15
None	0.67**	0.88***	0.79*	0.44*	0.98***	1.35***
Model IV						
Proceptive behaviour (ref. No)						
Yes	-	-	-	-	1.24***	2.93***

* p<0.05; ** p<0.01; *** p<0.001. Models controlled for all background variables.

5.3.3. Testing the Effect of Fertility Desires, Fertility Intentions, Contraceptive Behaviour and Proceptive Behaviour

In the second stage of the multivariate analysis we compared the predictive value of three models with the following combinations of variables: fertility intentions and partners' combined fertility desires (Model V), fertility intentions and contraceptive behaviour (Model VI) and fertility intentions and proceptive behaviour (Model VII).

To test the first part of Hypothesis 1, i.e. that intentions predict a subsequent birth better than desires, we compared the goodness of fit of the model including both fertility intentions and partners' combined fertility desires (Model V in Table 4) with the goodness of fit of the one including only fertility intentions (Model II in Table 3). For both countries in which this analysis could be done, Austria and Bulgaria, we do not reject the hypothesis that those who reported an intention to have a child were more likely to have a child than those who perceived an agreement with their partner on wanting a child, since the coefficients for having a child were significantly higher for positive intentions than for an agreement on wanting. However, in Austria, the results show that the inclusion of fertility desires in the models improves the predictive performance of the model (likelihood-ratio test, p-values: 0.005 and 0.002, for childless and parent respondents, respectively). For Bulgaria, we cannot conclude that the information on partners' desires increases the prediction accuracy for a fertility outcome (likelihood-ratio test, p-values >0.05). Even more, the effect of fertility desires is never statistically significant with the only exception of those who perceive a negative disagreement (beta equals to 0.60).

To test the second part of Hypothesis 1, i.e. that contraceptive behaviour predicts a subsequent birth better than birth intentions, we compared the fitting of the models including both fertility intentions and contraceptive behaviour (Model VI, Table 4) or proceptive behaviour (Model VII, Table 4) with the model including only fertility intentions (Model II, Table 3). On the basis of the results of the likelihood-ratio test we reject the hypothesis that non-use of contraception, or proceptive behaviour, predicts a birth better than intentions; moreover, the model estimates of positive fertility intentions are significantly higher than those of non-use of contraception or proceptive behaviour. For all countries and parities, we conclude that non-use of contraception does not significantly explain the birth outcome when confronted with fertility intentions (likelihood-ratio test, p-value >0.10). However, in France the inclusion of proceptive behaviour significantly improves the accuracy of the models run on parents (likelihood-ratio test, p-value = 0.004), and parents who were proceptive showed a significantly higher probability of having a/another child than those who were not (beta = 1.05) even after controlling for birth intentions.

Table 4: Logistic regression models on having a child in the inter-survey period (Beta coefficients of models including different pairwise combinations of motivational variables)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Model V						
Perception of agreement with partner about wanting a/another child now (ref. R no, believes P no)						
R no or not sure, believes P yes	0.76	0.11	0.01	0.60 *	-	-
R yes, believes P no or not sure	0.17	0.01	0.03	0.01	-	-
R yes, believes P yes	0.90 **	0.93 ***	0.19	0.10	-	-
Intention to have a child within three years (ref. Definitely not)						
Probably not	1.59 ***	1.28 ***	0.42	0.31	-	-
Probably yes	2.78 ***	2.51 ***	1.18 *	1.61 ***	-	-
Definitely yes	2.92 ***	2.81 ***	1.67 **	1.88 ***	-	-
	p-value of the likelihood-ratio test (Model V *vs.* Model II)					
	0.005	0.002	0.92	0.07	-	-
Model VI						
Intention to have a child within three years (ref. Definitely not)						
Probably not	1.60 ***	1.31 ***	0.45	0.32	0.89	1.14 **
Probably yes	2.86 ***	2.60 ***	1.18 *	1.66 ***	2.07 ***	2.09 ***
Definitely yes	3.28 ***	3.19 ***	1.64 **	1.87 ***	2.82 ***	3.37 ***
Contraceptive behaviour (ref. Safer methods)						
Natural methods	0.19	0.72	0.38	0.41	1.11	0.23
None	0.06	0.28	0.50	0.15	0.35	0.40
	p-value of the likelihood-ratio test (Model VI *vs.* Model II)					
	0.93	0.16	0.38	0.16	0.36	0.30
Model VII						
Intention to have a child within three years (ref. Definitely not)						
Probably not	-	-	-	-	0.85	1.12 **
Probably yes	-	-	-	-	2.03 ***	2.06 ***
Definitely yes	-	-	-	-	2.84 ***	3.03 ***
Proceptive behaviour (ref. No)						
Yes	-	-	-	-	0.16	1.05 **
	p-value of the likelihood-ratio test (Model VII *vs.* Model II)					
	-	-	-	-	0.65	0.004

* p<0.05; ** p<0.01; *** p<0.001. Models controlled for all background variables.

5.3.4. The Predictive Value of Positive and Negative Fertility Intentions in Combination with Partners' Agreement/Disagreement on Fertility Desires

To test the first part of Hypothesis 2, i.e. that birth intentions are more predictive of a birth if they are coupled with the partners' agreement on having a child, we analysed the coefficients of a model including the combination of intentions with partners' agreement on wanting a child (Model VIII, Table 5). As expected, individuals who definitely intended to have a child and perceived an agreement with their partner on wanting a child were more likely to have one than those who intended but perceived a disagreement. Similarly, individuals uncertain about their intentions (*probably yes*) were also more likely to have a child if they perceived an agreement, with the exception of

Bulgarian parents. Hence, with only this exception, we could not reject Hypothesis 2a. Moreover, individuals who intended to have a child were more likely to have one even if an agreement on not wanting a child or a disagreement was perceived (for childless Bulgarians the coefficient of *P yes + disagree or agree on no* (0.86) is not significant). This finding suggests that even if people tend to incorporate the perception of their partner's desires in their own intentions, a disagreement or a negative agreement are not sufficient to undo the positive effect of births intentions on birth outcomes.

Table 5: Logistic regression models on having a child in the inter-survey period (Beta coefficients of variables combining positive and negative fertility intentions with partners' agreement/disagreement on wanting a child)

	Austria		**Bulgaria**		**France**	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Model VIII						
Positive intentions combined with agreement/disagreement on wanting a child (ref. D not and P not)						
P yes + Disagree or agree on no	1.71***	1.90***	0.86	1.55***	-	-
P yes + Agree on yes	2.55***	2.52***	1.26*	1.49***	-	-
D yes + Disagree or agree on no	1.97***	1.92***	1.31*	1.21*	-	-
D yes + Agree on yes	2.62***	3.21***	1.70***	1.87***	-	-
Model IX						
Negative intentions combined with agreement/disagreement on wanting a child (ref. D yes and P yes)						
P not + Disagree or agree on yes	-0.70	-1.72***	-2.07	-1.04**	-	-
P not + Agree on no	-1.56***	-1.58***	-0.38	-1.60***	-	-
D not + Disagree or agree on yes	-2.02	-1.99***	-1.34	-1.92***	-	-
D not + Agree on no	-3.17***	-3.06***	-1.55*	-1.70***	-	-

* p<0.05; ** p<0.01; *** p<0.001. Models controlled for all background variables.

The second part of Hypothesis 2 could not be rejected: those who had a negative intention (*definitely* or *probably not*) and perceived a negative agreement were more likely to realise their plans and desires than those who did not intend but perceived a disagreement with the partner. There are, however, differences between childless persons and parents, and between Austria and Bulgaria. For parents a disagreement did not significantly change the effect of a negative intention (i.e. despite disagreeing with their partner they were still more likely not to have a child), but it did for childless persons—to a degree that the respective estimates of the model lose their statistical significance. Hence, childless individuals seem to be more erratic about realising their negative intention when they perceive a disagreement with partner. This result holds true regardless of the certainty of birth intentions in Austria while it is responsive to the certainty of intentions in Bulgaria. In this latter country no changes are observed in the statistical significance of coefficients with or without agreement if the intention is expressed as *probably not*, but only in the magnitude of beta equalling -0.38 in case of

agreement and -2.07 in case of disagreement (Model IX Table 5). By contrast, if the intention is expressed as *definitely not* the coefficient becomes statistically significant only among those not intending and perceiving an agreement on not wanting with the partner (-1.55) while it is statistically not significant among those not wanting and perceiving a disagreement with the partner (-1.34).

5.3.5. The Predictive Value of Contraceptive Behaviour or Proceptive Behaviour, In Combination with Fertility Desires or With Fertility Intentions

To test the first part of Hypothesis 3 (i.e. that those who did not use contraception and perceived an agreement on wanting a child were more likely to have one than those who despite perceiving an agreement on having a child were still using contraceptive methods at the time of the survey), we compared the fitting of the models in which we combined partners' fertility desires with contraceptive behaviour (Model X, Table 6) with that of the models including only partners' fertility desires. We could not reject the hypothesis that those who did not use contraception and perceived an agreement with their partner on wanting a child were more likely to have a child than those who, despite agreeing on wanting, were still using contraception, for childless individuals. However, we rejected this hypothesis for parent respondents, since the estimates were higher among those who, despite agreeing on wanting a child, used contraception (2.47 for Austria and 1.37 for Bulgaria, respectively) than among those who agreed on yes and did not use contraception (2.08 and 1.23, also for Austria and Bulgaria). Notwithstanding the ambiguity that is present, we find that combining the information on partners' fertility desires with contraceptive behaviour actually improves the predictive accuracy for birth outcomes, but only in the case of Austrian parents and childless Bulgarians (likelihood-ratio test, p-values <0.05, when comparing Model X with Model X a). In these particular cases, contraceptive behaviour was a more accurate predictor of a birth when jointly analysed with partners' fertility desires.

To test the second part of Hypothesis 3 (i.e. that incorporating information on contraceptive behaviour in the variables on birth intentions improves the predictive values of the latter), we compared the fitting of the models for both intentions and contraceptive behaviour (Model XI, Table 6) with that of the models including only birth intentions (Model XI a, Table 6). We rejected the hypothesis that those who did not use contraception and had a positive intention were more likely to have a child than those who, despite intending to have a child, still used contraceptive methods. Combining contraceptive behaviour with short-term fertility intentions does not improve the predictive power of the models (likelihood-ratio test, p-values >0.10, when comparing Model XI with Model XI a). There is also an ambiguity when combining fertility intentions with contraceptive behaviour; for example, among Bulgarian parents who are certain about their birth intention (*definitely yes*), the coefficient of having a child is higher for use of contraception (1.92) than for non-use of contraception (1.53).

To test the third part of Hypothesis 3, i.e. that those who intend to have a child and take proceptive measures are more likely to have a child than those who have positive intentions but are not proceptive, we compared the model including both fertility intentions and proceptive behaviour (Model XII, Table 6) with the model including only fertility intentions (Model XI a, Table 6). For childless individuals we rejected this hypothesis since the estimated coefficients did not significantly differ in the two models (p-value = 0.73). For parents the model combining proceptive behaviour with fertility intentions improved the predictive accuracy for a birth (likelihood-ratio test, p-value = 0.005, when comparing Model XII with Model XI a).

Finally, to test Hypothesis 4, i.e. that proceptive behaviour is a stronger predictor of a birth than non-use of contraception, we compared the predictive power of Model XIII including non-use of contraception and Model XIV including proceptive behaviour (Table 7). The predictive power of proceptive behaviour is higher than that of non-use of contraceptives for parents, since the Nagelkerke R^2 and AUC values are higher for the model in which we consider proceptive behaviour. Hence, we could not reject the hypothesis that proceptive behaviour predicts the birth of a child more precisely than non-use of contraception. As for childless respondents, we could not detect any significant difference in the predictive power of non-use of contraception and proceptive behaviour.

Table 6: Logistic regression models on having a child in the inter-survey period (Beta coefficients of variables combining fertility desires and fertility intentions with contraceptive behaviour and proceptive behaviour)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Model X						
Fertility desires & contraceptive behaviour (ref. Both no + use)						
Both no + non-use	-0.63	0.04	1.72 *	0.24	-	-
One doesn't + use	0.96 ***	0.21	0.71	0.86 **	-	-
One doesn't + non-use	0.70	1.51 ***	-0.41	0.88 *	-	-
Both yes + use	1.25 **	2.47 ***	0.67	1.37 ***	-	-
Both yes + non-use	1.73 ***	2.08 ***	1.30 **	1.23 ***	-	-
Model X a						
Perception of agreement with partner about wanting a/another child now (ref. Both no)						
One doesn't	0.97 ***	0.60 *	0.30	0.80 ***	-	-
Both yes	1.69 ***	2.19 ***	0.70	1.24 ***	-	-
	p-value of the likelihood-ratio test (Model X *vs.* Model X a)					
	0.25	0.04	0.04	0.80	-	-
Model XI						
Fertility intentions & contraceptive behaviour (ref. D not + use)						
D not + non-use	0.49	0.53	1.38	0.23	0.19	-0.15
P + use	2.36 ***	2.01 ***	1.16	1.08 ***	1.55 ***	1.84 ***
P + non-use	2.11 ***	2.22 ***	1.54 *	1.12 ***	2.42 ***	1.78 ***
D yes + use	3.11 ***	3.08 ***	1.70 *	1.92 ***	2.83 ***	3.11 ***
D yes + non-use	3.49 ***	3.47 ***	2.11 **	1.53 ***	2.98 ***	3.89 ***
Model XI a						
Fertility intentions (ref. Definitely not)						
Probably	2.29 ***	1.96 ***	1.04	1.03 ***	1.60 ***	1.88 ***
Definitely yes	3.24 ***	3.17 ***	1.68 **	1.66 ***	2.87 ***	3.51 ***
	p-value of the likelihood-ratio test (Model XI *vs.* Model XI a)					
	0.49	0.43	0.54	0.69	0.56	0.19
Table 6 (Continued)						
Model XII						
Fertility intentions & proceptive behaviour (ref. D not + no proceptive behaviour)						
P + no	-	-	-	-	1.59 ***	1.82 ***
D yes + no	-	-	-	-	2.82 ***	3.02 ***
D yes + yes	-	-	-	-	2.95 ***	4.06 ***
	p-value of the likelihood-ratio test (Model XII *vs.* Model XI a)					
	-	-	-	-	0.73	0.005

* p<0.05; ** p<0.01; *** p<0.001. Models controlled for all background variables.

Table 7: Logistic regression models on having a child in the inter-survey period (Beta coefficients of contraceptive and proceptive behaviour)

	Austria		Bulgaria		France	
	Childless	**Parents**	**Childless**	**Parents**	**Childless**	**Parents**
Model XIII						
Contraceptive behaviour (ref. Use)						
Non-use	0.66 **	0.80 ***	0.69 *	0.23	0.96 ***	1.34 ***
R^2	0.20	0.40	0.18	0.28	0.30	0.48
AUC	0.74	0.87	0.72	0.87	0.79	0.91
Model XIV						
Proceptive behaviour (ref. No)						
Yes	-	-	-	-	1.24 ***	2.93 ***
R^2	-	-	-	-	0.30	0.52
AUC	-	-	-	-	0.79	0.93

* p<0.05; ** p<0.01; *** p<0.001. Models controlled for all background variables.

6. Conclusions

In this study, we analysed the predictive power of short-term fertility intentions, combined partners' fertility desires, non-use of contraception and proceptive behaviour.

Proceptive behaviour was measured by a proxy variable indicating whether a couple was currently trying to have a child at the time of the first interview. We performed several logistic regression models in a sequence of steps: first, considering the variables indicated above in separated models; second, including pairwise combination of them in the models; and finally, running models with variables combining together intentions, desires and contraceptive use in a pairwise fashion and testing the predictive value of the more complex variables versus the simplest ones. The performance of the different type of models has been tested with the aim to see whether fertility intentions explain fertility outcomes better than the partners' fertility desires and whether a couple's proceptive behaviour is a more proximate determinant of a birth outcome than a couple's non-use of contraception. We used likelihood-ratio tests in order to derive information on the best suitable model and to see whether combining a couple's contraceptive or proceptive behaviour with fertility intentions and fertility desires improved the predictive accuracy for birth outcomes. Finally, we tested the predictive performance of proceptive behaviour versus non-use of contraception.

The GGS data showed that an individual's own fertility intentions are more predictive of a birth than both partners' combined fertility desires, consistently with Miller and Pasta (2004 and 2010). In Austria but not in Bulgaria, the perception of partners' desires improves the predictive accuracy of an individual's birth intentions on birth outcomes. An agreement with the partner on wanting a child strengthens the realisation of an individual's fertility intentions, which is consistent with the theoretical discussions in Miller and Pasta (1996 and 2004) and Miller et al. (2016). Even if an individual perceives a disagreement on wanting a/another child, his or her own positive intention increases the chance of having one. This result may be a signal that, if respondents intend to have a

child they are not discouraged by a discordant opinion of the partner. The same cannot be assumed about an individual's negative motivations. Childless individuals seem to be more likely not to realise their negative intentions when they perceive a disagreement with their partner. On the other hand, the realisation of parents' negative intentions was not responsive to the perception of disagreement. These results suggest that parents' intentions to not have a child predominate over the perception of disagreement, while childless respondents' negative intentions are more likely to be overshadowed. However, it might be that childless respondents are less assertive upon perceiving their partner's fertility desires. Hence, a bias in the perception of the partner's desires may be enhanced by the characteristics of childless respondents: younger individuals who are experiencing shorter relationships with non-resident partners.

Combining the information on contraceptive behaviour with short-term fertility intentions did not improve the predictive accuracy for birth outcomes. However, combining it with fertility desires actually improved these predictions in the case of Austrian parents and childless Bulgarians. Hence, the effect of contraceptive behaviour seems to differ when combined with partners' desires and with individuals' intentions. This result can be related with non-use of contraception being more accurately predicted by a respondent's perception of agreement with his or her partner on wanting a/another child than with an individual's fertility intentions, as shown by Testa (2012). However, this can also be a reflection of the timing captured by these measures, since both contraceptive behaviour and partners' fertility desires were measured at the time of the first interview. On the contrary, the effect of *intentions and contraceptive behaviour* is maybe not significant because contraceptive behaviour was captured at the time of the first interview and fertility intentions were meant to measure an intention within three years. In fact, one can have an intention to have a child within three years and still use contraceptives when asked about such intentions. Hence, a couple's contraceptive behaviour reported at the time of the first interview is not likely to better predict the realisation or non-realisation of a pregnancy intention. This result can be related with the instability attached to reports on contraceptive behaviour, since it can happen that someone who reports not to be currently using any contraceptive method is just in-between methods and actually does not intend to have a child (Blanc et al., 2002).

The effect of proceptive behaviour could not be assumed to be the most accurate predictor of a birth outcome, since individual fertility intentions showed to be more correlated with the birth of a child. However, although the conjunction between contraceptive behaviour and short-term fertility intentions did not improve the accuracy of the predictions on a fertility outcome, the opposite happened when considering the information on proceptive behaviour. For France, we found that combining the information on proceptive behaviour with short-term fertility intentions actually improves the accuracy for predicting birth outcomes. Hence, even if proceptive behaviour is captured at the time of the first interview and even in the presence of short-term fertility intentions (which showed to be the stronger predictors of fertility behaviours), this measure still shows better prediction levels than the non-use of contraception. In fact, we proved that the predictive power of proceptive behaviour is higher than contraceptive

behaviour, which means that the proxy used for proceptive behaviour is a better predictor of a birth outcome than non-use of contraception. Hence, it seems that asking respondents about the couple's contraceptive behaviour is not as effective as asking them if they are currently trying to have a child. Still, the proxy used for proceptive behaviour is not closer to explain a birth outcome than individual fertility intentions are. Indeed, in the models controlled for individual fertility intentions, we found that desires, proceptive behaviour and especially contraceptive behaviour lose their importance.

Considering the theories on couples' fertility decision-making and reproductive behaviour, we attempted to improve the knowledge on a couple's dyadic interaction by studying the partners' motivations and their contraceptive or proceptive behaviour. We found that fertility intentions are a stronger predictor of birth outcomes than fertility desires and contraceptive or proceptive behaviour. However, for Austria, models with both intentions and a combination of the partners' desires should be preferred. We also found that combining the information on contraceptive behaviour with fertility intentions does not improve the predictions on birth outcomes. However, in France the variable combining proceptive behaviour with fertility intentions predicts birth outcomes better than fertility intentions; moreover, proceptive behaviour is a better predictor of a birth outcome than non-use of contraception.

This paper calls for the importance of collecting couple-level data on fertility desires, intentions and behaviour. Studies on couples' fertility decision-making should consider not only an individual's motivations and perception of his or her partner's motivations, but also the actual motivations of the partner. Moreover, contraceptive behaviour should be collected not only with detailed information on the methods chosen by the couple but also with the information on the timing of using those methods. Likewise, the collection of data on proceptive behaviour should be considered, as this could inform on whether individuals are trying or not to have a child and, therefore, improve the knowledge on the most proximate determinants of a couple's reproductive behaviour.

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