It Takes Two: A Longitudinal Dyadic Study on Predictors of Fertility Outcomes

Roos Hutteman

Humboldt-University Berlin

International Max Planck Research School LIFE

Wiebke Bleidorn

Tilburg University

Lars Penke

University of Edinburgh

Jaap J. A. Denissen

Tilburg University

Author Note

This paper used data from the German Family Panel (PAIRFAM), coordinated by Josef Brüderl, Johannes Huinink, Bernhard Nauck, and Sabine Walper. PAIRFAM is funded as a long-term project by the German Research Foundation (DFG, SPP 1161).

Correspondence concerning this article should be addressed to Roos Hutteman, Institute of Psychology, Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany. Email: roos.hutteman@hu-berlin.de.

Abstract

Objective: Although previous studies have found personality traits to be associated with reproductive behavior, it remains unclear whether there are dyadic associations between partners' personality and couples' decisional process to have children. The aim of the present study was to investigate the associations between partners' personality, parenthood expectations and intentions, and the couple's fertility outcomes one year later. **Method:** We used dyadic longitudinal data from 2,482 couples with a mean age of 32.7 years (*SD* = 5.9) participating in the Panel Analysis of Intimate Relationships and Family Dynamics (PAIRFAM). **Results:** Self-esteem, shyness, and aggressiveness of both partners were related to one's own and one's partner's expectations about parenthood. These expectations were associated with one's own and one's partner's intentions to become a parent, which in turn predicted the couple's actual fertility outcomes. Personality traits of both partners were directly associated with the fertility outcome, with self-esteem of both partners and male aggressiveness predicting the couple's decision to have their first child. The effect of self-esteem on the decision to become a parent was mediated by the partner's intention. **Conclusions:** In sum, our findings stress the importance of psychological factors in fertility outcomes and emphasize the role of dyadic processes.

Keywords: fertility outcomes, personality, dyadic effects, longitudinal study

It Takes Two: A Longitudinal Dyadic Study on Predictors of Fertility Outcomes

Birth rates in many Western societies have dropped below the replacement level (OECD, 2011), which in combination with restricted immigration leads to population declines. Governments invest large amounts of money to facilitate parenthood, for example by paying parents child benefits and by spending on early childcare. Despite these policies, birth rates remain low in most parts of the Western world, suggesting that factors apart from monetary aspects might influence childbearing decisions. This topic has grabbed the scientific attention of demographers, sociologists, and most recently also of psychologists. Studies from a demographical and sociological perspective have mainly focused on the impact of expected and perceived costs and benefits of parenthood on childbearing intentions and decisions (e.g., Fawcett, 1988; Liefbroer, 2005). First studies on psychological determinants of having children have primarily investigated individual personality traits as predictors of the actual fertility outcomes (Jokela, Alvergne, Pollet, & Lummaa, 2011; Jokela, Hintsa, Hintsanen, & Keltikangas-Järvinen, 2010; Jokela, Kivimäki, Elovainio, & Keltikangas-Järvinen, 2009). However, fertility studies integrating both perspectives by investigating broad personality traits as well as more concrete expectations and intentions are lacking. In addition, previous psychological studies have all focused on individual resources and characteristics, thereby ignoring the fact that childbearing decisions[1] are typically made within partnerships. In the present study we used dyadic longitudinal data from a German representative panel study (PAIRFAM; Huinink et al., 2011) to investigate whether personality traits as well as parenthood expectations and intentions of both partners predict the couple's fertility outcomes.

Childbearing as a Rational Decision

[1] It should be noted that not all pregnancies are conscious decisions and that a substantial number of pregnancies are unplanned. However, the majority of pregnancies in Germany are planned (Feldhaus & Boehnke, 2007).

In the 18th and 19th century, most Western societies underwent a shift from having high fertility and mortality rates to having low fertility and mortality rates, also referred to as the first demographic transition (Kirk, 1996; Thompson, 1929). The contraceptive revolution in the 1960s went hand in hand with a still continuing second demographic transition (Lesthaeghe, 2010), which is characterized by sub-replacement fertility (i.e., an average of less than 2.1 children per woman) and a disconnection of sexual behavior and reproduction (Rijken, 2009). This has decreased the role of biological fertility in reproductive behavior and increased the role of individual choice (Van de Kaa, 2001; Potts, 1997). The increased importance of individual choice has encouraged researchers to investigate psychological predictors of variations in fertility.

Fishbein and Ajzen's Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) provides a fruitful psychological model to investigate such individual choices. Three general constructs underlie the TRA: Behavioral intentions, attitudes, and subjective norms. It is suggested that the likelihood to perform a certain behavior is determined by the intention of a person to perform that behavior. This intention, in turn, depends on the person's attitude towards the consequences of performing the behavior, and on subjective norms, i.e. on normative beliefs of what is socially expected and the motivation to comply with those norms. Taking the outcome of becoming a parent as an example, the decision-making process would look as follows: An individual's probability of having a child is predicted by his or her intention to become a parent, which depends on his or her attitude towards consequences of having a child (e.g., "Having a child is in conflict with my career goals") and on his or her normative beliefs (e.g., "I am at an age where one should start a family").

Several earlier empirical studies have provided evidence for the TRA in the context of fertility decisions. These studies have found that the attitude towards the consequences of becoming a parent and the normative beliefs about parenthood are associated with the

intention to become a parent (Davidson & Jaccard, 1975; Miller & Pasta, 1994; Thomson, 1997; Vinokur-Kaplan, 1978) and that the intention to become a parent strongly predicts actual fertility outcomes (Miller & Pasta, 1995; Vinokur-Kaplan, 1978).

One line of research that has specifically focused on attitudes towards consequences of having children has investigated whether fertility decisions are the result of rationally considering the costs and benefits of having children (Liefbroer, 2005). These studies are based on literature on the Value of Children, which assumes that childbearing decisions are related to the value that children have for fulfilling the psychological needs of parents (Fawcett, 1988; Hoffman & Hoffman, 1973). These values can be grouped into positive (e.g., emotional rewards) and negative values (e.g., economic costs). Empirical studies have found high perceived benefits to be associated with a higher intention to have another child in women (Beckman, 1979) and with an earlier timing of the entry into parenthood for both men and women (Liefbroer, 2005). High levels of perceived costs, on the other hand, have been found to be associated with postponing the transition to parenthood (Liefbroer, 2005)

What remains unclear from these studies, however, is how variation in the consideration of the costs and benefits of parenthood can be explained. Why do some people have positive and others negative attitudes and intentions towards having children?

Personality and Fertility Outcomes

Personality has been found to be an important antecedent of childbearing motivation (Miller, 1992). Consistent with the two aforementioned types of values of children, childbearing motivation consist of two independent types: Positive childbearing motivation refers to the expected positive consequences (benefits) of having a child, whereas negative childbearing motivation refers to the expected negative consequences (costs). Miller (1992) found participants with high scores on nurturance (who give sympathy and comfort) and affiliation (who enjoy being with others) to have a more positive childbearing motivation

than those scoring low on these traits. Highly autonomous individuals (who try to break away from restraints and are not tied to people and places) had a less positive childbearing motivation than people scoring low on this trait. Regarding expected negative consequences of parenthood it was found that males and females with high scores on nurturance had a less negative childbearing motivation, as was the case for highly affiliative females.

Research linking personality directly to actual reproductive outcomes has found associations with the probability and timing of having children and with number of offspring (Jokela et al., 2011, 2010). Using Finnish data, Jokela and colleagues found associations between temperamental traits and the probability of becoming a parent (Jokela et al., 2010). Higher fertility was associated with high levels of reward dependence (affectionateness and social behavior), low novelty seeking (less motivation to explore novel situations), low harm avoidance (less behavioral inhibition), and low persistence (less perseverance and eagerness; Jokela et al., 2010) and with high levels of leadership personality and sociability and low levels of negative emotionality (Jokela & Keltikangas-Järvinen, 2009).

A number of previous studies has found the association between personality and the probability of having a child to be stronger for the first child than for later children (Jokela et al., 2011, 2009). That is, personality seems to play an especially important role for the entry into parenthood, whereas the effect weakens for having additional children, for which the experiences with previous children might play a larger role (Jokela, 2010).

In a recent study, Jokela and colleagues investigated the relationship between the Five Factor Model personality traits and reproductive outcomes (Jokela et al., 2011). They found extraversion to be positively associated with the number of children, whereas a negative association was found for neuroticism and openness to experience. Gender differences were found for agreeableness and conscientiousness, with number of children only associated with higher agreeableness and lower conscientiousness in women. Some studies found similar

associations between personality and fertility outcomes (Dijkstra & Barelds, 2009), whereas other studies found rather contrasting results (Eaves, Martin, Heath, Hewitt, & Neale, 1990; Nettle, 2005). The inconsistent findings and gender specificities make it difficult to draw conclusions from these previous studies.

Previous research on the links between personality and fertility outcomes has primarily investigated how one's own personality traits are associated with outcomes such as the number of children (Jokela et al., 2011). However, the majority of children are born within marriages[2] (67% in Germany in 2010; Statistisches Bundesamt Deutschland, 2012), making it mostly a couple's decision rather than an individual decision. As a result, one might expect the characteristics of both partners to influence the couple's reproductive behavior. In the following section, the role of dyadic processes is discussed in more detail.

Partner Influences on Fertility Outcomes

Although most psychological studies on fertility have focused on individual characteristics as predictors of fertility outcomes, scholars are beginning to emphasize the importance of investigating both partners within a relationship (e.g., Miller, Severy, & Pasta, 2004). Sociology has a longer history of including both partners and empirical studies in this field have mainly investigated the agreement between and relative influence of partners' intentions and desires on couple's childbearing decisions.

Sociological research on the agreement between partners has found that fertility desires are usually very similar among partners (Sorenson, 1989) and that the degree of this agreement between husband's and wife's fertility attitudes and intentions predicts the couple's fertility outcomes (Coombs & Chang, 1981; Thomson, 1997; Thomson, McDonald, & Bumpass, 1990). Studies on the relative influence of wives' and husbands' desires and

[2] No country level statistics are available with regard to the percentage of children being born within partnerships. Given the decrease in the number of marriages in Germany (Statistisches Bundesamt Deutschland, 2010), we assume the percentage of children being born within partnerships to be even higher than the percentage of children being born within marriages.

intentions have found males and females to be equally influential in fertility outcomes (e.g., Bauer & Kneip, in press). However, Coombs and Chang (1981) found the woman to be more influential in case of disagreement between partners.

Thomson (1997) went one step further and not only investigated the relative influence of husbands' and wives' intentions on fertility outcomes, but also how partners' desires mutually influence each other's fertility intentions. She found that one's partner's fertility desires were associated with one's own fertility intentions over and above one's own fertility desires. However, this study did not take into account the interdependence within dyadic relationships. That is, individuals within a dyad are more alike than people who are not within this dyad, making their data interdependent (Kenny, Kashy, & Cook, 2006).

Although these sociological studies give insight into the importance of both partners' intentions and desires for fertility outcomes, dyadic psychological studies investigating the influence of partners' interindividual differences are lacking. To the best of our knowledge, no previous study has looked at dyadic effects of personality on couples' fertility outcomes.

The Present Study

In the present study, we investigated whether one's own and one's partner's personality are associated with childbearing expectations and intentions and how these factors predict couples' fertility outcomes one year later. We analyzed data from the Panel Analysis of Intimate Relationships and Family Dynamics (PAIRFAM; Huinink et al., 2011) a German representative, multidisciplinary, longitudinal study.

First, we hypothesized that self-esteem, shyness, and aggressiveness are associated with expectations about parenthood. We expected one's own and partner's shyness, aggressiveness, and self-esteem to predict the own and partner's expectations about negative and positive consequences of parenthood. Previous studies have found personality traits that are characterized by low shyness, such as affiliation (Miller, 1992) and extraversion (Jokela

et al., 2011), to be positively related to parenthood expectations and fertility outcomes respectively. As a result, we expected negative associations between shyness and childbearing expectations, intentions, and outcomes. Similar results were found for traits marked by low aggressiveness: Agreeableness (Dijkstra & Barelds, 2009; Jokela et al., 2011) and nurturance (Miller, 1992) were found to be positively related to childbearing. As a consequence we expected aggressiveness to be negatively associated with childbearing expectations, intentions, and outcomes. On the other hand, personality traits characterized by low self-esteem, such as neuroticism, have previously been found to be negatively related to fertility outcomes (Jokela et al., 2011). We therefore expected the results for self-esteem to be the opposite of the results for shyness and aggressiveness in that we expected self-esteem to be associated with positive parenthood expectations, intentions, and outcomes.

Second, based on the previously described Theory of Reasoned Action (e.g., Fishbein & Ajzen, 1975) and Value of Children literature (e.g., L. W. Hoffman & M. Hoffman, 1973), we further expected one's own and partner's positive and negative expectations about parenthood to be associated with one's own and one's partner's intention to become a parent. Third, this intention was expected to be predictive of the couple's actual fertility outcomes one year later. Fourth, we hypothesized that one's own and one's partner's shyness, aggressiveness, and self-esteem directly predict the couple's fertility outcomes, and fifth, that this association is mediated by one's own and one's partner's childbearing intentions and expectations. Finally, based on the previously reported differences in the strength of effects of personality on having the first versus having later children (Jokela et al., 2011, 2009) we expected the association between partners' self-esteem, shyness, and aggressiveness and the couple's fertility outcomes to be stronger for the first child than for later children.

Method

Participants and Procedure

Analyses were based on data from the first two waves of the German family panel PAIRFAM (release 2.0). A detailed description of the PAIRFAM study can be found in Huinink et al. (2011). Potential participants were randomly selected from population registers of 343 randomly selected communities, leading to an initial sample of 12,402 anchor participants from three birth cohorts 1971-73, 1981-83 and 1991-93. In addition 3,743 partners took part in the study. Anchors were interviewed using a computer-assisted personal interview and partners received paper and pencil questionnaire upon consent of the anchor to interview the partner. For the present study, we used a subsample of the original sample of 3,743 couples by only including couples that were biologically capable of having children together and that were in a realistic age range to have children. That is, we excluded the youngest cohort (aged 15-17 in Wave 1), homosexual couples, and infertile couples (N = 843). This resulted in a subsample of 2,900 couples with a mean age of 32.7 years (SD = 5.9, range = 18–75). Wave 2 was carried out approximately 1 year after baseline and a total of 2,482 couples participated in both waves (missing data are described in more detail below). Anchor and partner datasets were merged and transformed so that dyadic variables referred to the male and female within the dyadic relationship. On average, the couples had been in this relationship for 8.7 years (SD = 67.1, range = 1–297), 63.9% of them were married, and 89.5% were cohabiting.

Measures

All measures used in the present study were self-reports filled out by both partners.

Personality. Self-esteem was measured at Wave 1 using a three-item short version of the Rosenberg self-esteem scale (Rosenberg, 1965). Items (e.g., I like myself just the way I am) were answered on a 5-point scale[3] from 1 (*not at all*) to 5 (*absolutely*). This scale had an internal consistency of $\alpha = .69$. Shyness was assessed using a three-item scale developed by

[3] The original 4-stage response format was expanded to a 5-stage response format in order to achieve uniform response formats across the personality questionnaires.

the PAIRFAM team (Huinink et al., 2011). Items (e.g., I feel inhibited in the presence of others) were answered on a 5-point scale from 1 (*not at all*) to 5 (*absolutely*) and had an internal consistency of $\alpha = .69$. Aggressiveness was also assessed using a self-developed scale (Huinink et al., 2011), adapted from a questionnaire by Schwarz and Gödde (1998). This scale consists of three items (e.g., I become angry very quickly) that were answered on a 5-point scale from 1 (*not at all*) to 5 (*absolutely*) and had an internal consistency of $\alpha = .80$.

Parenthood Expectations. Expectations about parenthood were measured using a scale based on the Value of Children literature (Arnold et al., 1975; Trommsdorff, Nauck, & Kallscheuer, 2005). Factor analysis revealed two factors. Positive expectations (e.g., How strongly do you expect to have an especially close emotional relationship with your children?) and negative expectations (e.g., How strongly do you expect that with children you will not accomplish your professional goals?) both consisted of five items and were answered on a 5-point scale from 1 (*not at all*) to 5 (*very strongly*). The internal consistency was $\alpha = .65$ for positive expectations and $\alpha = .77$ for negative expectations.

Parenthood Intention. Parenthood intention was assessed by asking whether participants intended to become a mother/father (again) in the next two years. This item was answered on a 4-point scale from 1 (*yes, definitely*) to 4 (*no, definitely not*).

Fertility Outcome. The fertility outcome was measured using an aggregated nominal variable, consisting of three items. In contrast to the other measures, this was a dyadic variable. Couples had a value of 1 on this variable if they were either trying to get pregnant, were currently expecting a child or gave birth to a child between Wave 1 and Wave 2. There were two subsamples for the outcome variable: For respondents who did not have children yet in Wave 1, the outcome variable referred to having a first child, whereas it referred to having an additional child for respondents who already had children in Wave 1.

Missing Data

Missing data were the result of attrition between Wave 1 and 2, as well as planned missingness (this will be described in more detail below). The percentage of attrition between Wave 1 and 2 was 14% in the current subsample, but no attrition effects were found for the study variables. That is, dropouts (couples who attended in Wave 1, but not in Wave 2) did not differ from those who participated in both waves with regard to their personality traits, parenthood expectations, and intention to become a parent. Planned missingness occurred for the intention to become a parent in the next two years (50%). This question was not asked when participants indicated that they did not consider having children at all. Since we aimed to predict couples' decision-making process over a time span of one year, we did not include participants in the analyses who indicated not wanting children at all (i.e. who did not answer the 2-year intention question). Comparison of participants with and without missings on this variable with Multivariate Analysis of Variance (MANOVA) showed that males (Wilks' Lambda = .95, $F(12, 803) = 3.74$, $p < .001$) and females (Wilks' Lambda = .96, $F(12, 803) = 2.54$, $p = .003$) who did not consider having children at all differed from participants who did consider having children. Both male and female participants who never wanted to have children had less positive expectations about parenthood than their counterparts who did consider having children ($F_{male}(1, 814) = 13.97$, $p < .001$, $\eta_p^2 = .02$; $F_{female}(1, 814) = 4.82$, $p = .028$, $\eta_p^2 = .01$). Males who did not consider having children at all had a lower self-worth than males who did ($F(1, 814) = 11.63$, $p = .001$, $\eta_p^2 = .01$) and females who did not want children had a higher income than females who did ($F(1, 814) = 11.69$, $p = .001$, $\eta_p^2 = .01$). Since the effect sizes were small (Cohen, 1988), they were not expected to influence further analyses, apart from a potential underestimation of the effect of negative expectations, males' self-worth, and females' income due to restricted variance.

Analytic Strategy

To investigate whether characteristics of actors and partners predict fertility outcomes,

we applied a longitudinal Actor Partner Interdependence Model (APIM; Kenny et al., 2006). APIM is an analytic strategy that takes into account the interdependence within dyadic relationships, also referred to as non-independence of observations. A graphical representation of the APIM used in this study is presented in Figure 1.

The APIM was tested using path analysis for nominal dependent variables, using maximum likelihood estimator with robust standard errors (MLR estimator) in Mplus version 6.11 (L. K. Muthén & B. O. Muthén, 1998). Missing data were handled using full information maximum likelihood (FIML), in which all available data are used to estimate the model. Associations between predictors and the nominal dependent variable (the decision to become a parent yes/no) are presented in Odds Ratios (ORs). ORs refer to the ratio of the odds of an event occurring in one group to the odds of it occurring in another group (p/(1-p)). Odds can be defined the ratio of the probability that an event will happen to the probability that the event will not happen. For example, if 1 out of 2 married women has a child, whereas only 1 out of 5 single women has a child, the OR of the event of childbirth occurring in a group of married versus single women would be 4 ((.5/(1-.5))/(.2/(1-.2)) = 1/.25= 4). However, in our case we were not interested in the odds of an event occurring in one group or the other, but in whether continuous variables (i.e., personality, expectations, and intentions) can predict the likelihood of the event to occur. In this case the OR can be interpreted as the increase in the odds of an event to occur for every one-unit increase in the predictor variable. Taking the association between self-esteem and becoming a parent as an example, an OR of 2 would mean that the odds of having a child becomes 2 times as likely for every one-unit increase in self-esteem.

Gender differences were explored by comparing models in which actor and partner effects were constrained to be equal for males and females with less restrictive models in which these effects were freely estimated. A decline in fit when fixing paths would indicate

gender differences, whereas a lack thereof would indicate an absence of gender differences in the particular parameter estimates. In case of a non-significant χ^2 test, the more parsimonious model with actor and partner effects constrained to be equal for dyadic partners was chosen. Since conventional fit indices are not available for models with nominal outcomes, nested models were compared by computing a chi-square difference test based on log-likelihood values and scaling correction factors, obtained with the MLR estimator (Mplus, 2012).

Results

Descriptive Statistics and Demographic Information

The means, standard deviations, and zero-order correlations of all study variables are presented in Table 1. Of the 2,482 couples participating in the study, 66 were trying to become parents for the first time and 48 were trying to become parents again. 43 couples were expecting the first child and 61 couples were expecting an additional child between Wave 1 and Wave 2. Sixty-six couples had their first child between Wave 1 and Wave 2 and 83 became parents again during this time. In total, 342 couples (13.8%) thus made the decision to have a child between Wave 1 and Wave 2: 159 for the first child (6.4%) and 183 for an additional child (7.4%).

Actor Partner Interdependence Model

Parameter estimates corresponding with the letters of the paths in Figure 1 are presented in Table 2a and 2b. Parenthood expectations are represented as one variable in Figure 1 for reasons of parsimony, but in fact represent two variables: Positive and negative parenthood expectations. For the associations with parenthood expectations, letters followed by an apostrophe refer to the positive expectations, whereas the letters without an apostrophe refer to negative parenthood expectations. Fertility outcomes were also represented as one variable in Figure 1 for reasons of parsimony, but the estimates of the two outcomes (for the first and for an additional child) can be found in separate columns in Table 2b.

Model fit comparison revealed no change in fit when paths were fixed to be equal for males and females, with the exception of the association between the intention to become a parent and the decision to have an additional child, the association between shyness and the partner's positive expectations, the association between aggressiveness and the partner's intention to become a parent, and the association between aggressiveness and the decision to have the first child. All other paths were constrained to be equal across dyadic partners.

Personality and Parenthood Expectations. In line with Hypothesis 1, both one's own and one's partner's self-esteem were negatively related to negative expectations about parenthood. That is, the higher one's own or one's partner's self-esteem, the lower one's own negative expectations. For positive expectations about parenthood, only significant actor effects were found, meaning that one's own, but not one's partner self-esteem was associated with more positive own expectations.

Similar effects were found for shyness and aggressiveness: Individuals who had high levels of shyness and aggressiveness or who had partners scoring high on these traits had more negative expectations about parenthood. Again, only actor effects were found for positive expectations: One's own aggressiveness and shyness were associated with lower levels of positive expectations.

Parenthood Expectations and Intentions. We found significant negative actor as well as partner effects of negative expectations on parenthood intentions. That is, lower levels of negative expectations of both actor and partner were associated with a higher intention to become a parent in the next 2 years. Surprisingly, however, neither actor nor partner effects of positive expectations on intentions were found, confirming hypothesis 2 only partially.

Parenthood Intentions and Fertility Outcomes. All associations described above were based on cross-sectional analyses (i.e., all variables were measured at Wave 1). With regard to the longitudinal part of the model, we found the intention to become a parent in the

next two years to increase the odds of having the first child one year later with almost 2. This association did not differ between men and women, which is in line with our third hypothesis.

The picture looked quite different for the decision to have an additional child, as gender differences were found for this effect. Although the association between the intentions of men and women within a relationship was high (r = .70), only the unique association between female intentions and the decision to have an additional child was significant. This implies that in case of discrepancy between partners' intentions, it is the female's intention that plays the crucial role with regard to the couple's actual decisional outcome. Specifically, for every one-unit increase in the intention to become a mother, the couple's odds of having an additional child quadrupled.

Personality and Fertility Outcomes. Within the full APIM, self-esteem was only a marginally significant predictor of fertility outcomes for the first child and did not significantly predict fertility outcomes for an additional child, which is in line with Hypothesis 6. However, the effect of self-esteem on the decision to have a first child did reach significance when all other paths within the model were omitted, indicating that this positive association might be mediated by expectations or intentions. Shyness was neither a significant predictor of parenthood decisions in the full APIM, nor in the model in which all other paths were omitted. Aggressiveness of the male but not of the female partner was a significant predictor of the decision to become a parent for the first time. Higher male aggressiveness predicted a lower probability that the couple had made the decision to have their first child one year later[4]. This partially confirms Hypothesis 4.

We further tested possible mediation effects underlying the associations between self-esteem and aggressiveness and having the first child in the following.

[4] In contrast to all other paths in the model, the effect of self-esteem and the effect of males' aggressiveness on the decision to become a parent for the first time disappeared when household income was controlled for.

Mediation Model

To examine the mechanisms underlying the relationship between self-esteem and the decision to have the first child, it was investigated whether (1) expectations about parenthood, and (2) intentions to become a parent mediated this association. Regarding the former, contrary to the hypotheses, neither positive nor negative expectations predicted the fertility outcomes for the first child. This violates the basic requirement for establishing a mediation effect. Regarding intentions, an association between the independent variable and the mediator could be established because partner's self-esteem (but not actor's own self-esteem) was positively related with the intention to become a parent ($B = .05$, $p < .05$). That is, the higher the self-esteem of the partner, the higher the intention to become a parent for the first time. Moreover, there was an association between the mediator and the dependent variable, because the intention to become a parent was a significant predictor of the probability to follow up on this intention (i.e., become a parent) for the first time one year later ($OR = 1.99$, $p < .05$). Including the indirect paths into the model led to a non-significant direct effect ($OR = 1.15$, ns) and fixing the indirect effect to zero led to a significant decrease in fit ($\Delta\chi^2$ (17, $N = 2900$) = 595.43, $p < .001$), indicating that own intentions to become a parent for the first time mediated the association between partner's self-esteem and the couple's actual fertility outcomes. Accordingly, people with insecure partners had a lower intention to have children with their partner and indeed also had a lower probability of having a child with that partner one year later. Fixing the direct effect to zero resulted in a decrease in model fit, indicating that the mediation was partial.

The intention to become a parent was also investigated as a possible mediator of the association between male aggressiveness and becoming a parent for the first time. However, this was not found to be the case as the association between the independent variable and the mediator was not significant: Male aggressiveness was not associated with the own or

partner's intention. In sum, our fifth hypothesis was partially confirmed with partner intention mediating the relationship between actor self-esteem and the couple's fertility outcomes.

Discussion

The present longitudinal study aimed at investigating actor and partner effects in the association between personality, childbearing expectations and intentions, and couples' fertility outcomes. We found self-esteem, shyness, and aggressiveness of both partners to be associated with their own and their partner's negative expectations about parenthood. One's own and partner's negative expectations were associated with the intention to become a parent, which in turn predicted the couple's fertility outcomes one year later. In addition, several direct effects were found between personality and fertility outcomes.

Personality and Parenthood Expectations

In line with our expectations, we found one's own and one's partner's personality to be associated with negative expectations about parenthood. High levels of one's own self-esteem were associated with less negative expectations, as was the self-esteem of the partner. Actor and partner shyness and aggressiveness were found to be positively associated with negative expectations. Participants with high levels of shyness and aggressiveness had more negative expectations, and high levels of partner shyness and aggressiveness were associated with more negative expectations as well. In addition, we found actor associations between personality and positive expectations about parenthood. One's own self-esteem was associated with higher levels of positive expectations, whereas own shyness and aggressiveness were linked to less positive expectations with regard to becoming a parent.

In contrast to our hypotheses, we did not find significant relationships between partners' personality traits and one's own positive expectations. Miller (1992) did find associations between personality and positive childbearing motivations, but the role of the partner was not investigated in this study, leaving it unclear whether effects were only driven

by one's own or also by one's partners' personality. The fact that we only found partner effects of personality on negative and not on positive expectations might be explained by the nature of these expectations. Having a self-confident partner might support a person's own confidence to master the difficulties of being a parent together with one's partner. People with shy or aggressive partners, on the other hand, might believe that the burden of parenthood will not be shared within their partnership but rather be placed on them, which affects negative expectations more than positive ones.

Expectations, Intentions, and Fertility Outcomes

Negative expectations towards the consequences of becoming a parent were negatively associated with the intention to become a parent. This was not only true for the own negative expectations, but also (over and above the actor effect) for those of the partner. That is, one's own and one's partner's negative expectations went along with a lower intention to have a child in the next two years. This finding is consistent with Hypothesis 2. However, results did not support our hypothesis that actors' and partners' positive expectations would be associated with intentions to become a parent. This is inconsistent with research suggesting that childbearing intentions follow from weighting up the costs and benefits of parenthood (e.g., Fawcett, 1988; Hoffman & Hoffman, 1973; Liefbroer, 2005).

The absence of associations between positive expectations and behavioral intentions in the present study might be explained by the long-term focus of the positive expectation items. Two out of five items referred to the positive consequences of having adult children. In contrast, the intention item was focused on the near future as it referred to the intention to have a child in the next two years. To investigate whether the time gap between these scales might have contributed to the lack of associations between positive expectations and parenthood intention, we reanalyzed our data excluding the two items referring to the benefits of having adult children. However, this did not change our results and the associations

between positive expectations and intentions remained insignificant. An alternative explanation might be offered by the way that humans tend to make decisions. According to Kahneman and Tversky (1984), people are generally risk or loss averse. Applying this to parenthood decisions, it can be suggested that the costs that go along with losing the status quo of not having children will be more salient than the benefits of losing this status quo compared to the alternative of having children.

Our results showed that the intention to become a parent predicts the couple's actual fertility outcomes one year later. This nicely fits the prediction from the Theory of Reasoned Action that the intention to perform a certain behavior (including family planning behavior; Fishbein, 1972) is the most important predictor of actually performing this behavior (Fishbein & Ajzen, 1975). In the present study, the couple's behavioral decision to have the first child was predicted by the intention of both the male and the female in the relationship. However, we found gender differences for the intention to become a parent again. Despite the high correlation between partners' childbearing intentions, only women's intentions predicted having another child. That is, in case of a discrepancy between the intentions of partners, the intentions of women appear to be the decisive factor. The fact that we only found gender differences for the association between the intention to become a parent and the fertility outcome of having another child might be explained by the differential impact of having children on the lives of men and women. Beckman (1984), for example, has suggested the wives' influence to be stronger as a result of the higher costs of parenthood for wives than for husbands (i.e., more problems to reach career goals, physical costs). In the present study, we did not find gender differences in the effects of expected cost and benefits on intentions and outcomes. However, it might be the case that the experienced stronger impact of having children on women's lives than on men's leads to a stronger influence of women's intention on the decision to have another child. Finally, this gendered effect could also be due to

women's usually greater control of contraception usage than men's.

Personality and Fertility Outcomes

As hypothesized, males and females with high self-esteem were more likely to have made the decision to have the first child one year later. Shyness did not predict fertility outcomes and only male aggressiveness negatively predicted couples' decision to have the first child. The finding that male aggressiveness was related to parenthood decisions in the current study while shyness was not might be explained by the different levels of threat of these traits in parents for offspring development. Parental aggressiveness has been suggested to contribute to physical child abuse (Belsky, 1993), which in turn has been found to lead to maladaptive developmental outcomes in children (Cicchetti & Carlson, 1989), whereas such effects have not been reported for shyness. The higher likelihood of fathers to physically abuse their children compared to mothers (Belsky, 1993) might trigger an avoidance of women to become pregnant by aggressive men, which might explain why only male aggressiveness was found to be associated with negative fertility outcomes in the our study. However, this account must be regarded speculative at this stage.

To test the robustness of our models, we controlled for household income. Although controlling for income did not affect the association between personality traits, parenthood expectations, and intentions, it eliminated direct effects of self-esteem and males' aggressiveness on the couple's fertility outcomes. Previous studies showed that associations between personality and fertility outcomes did not change after controlling for education (e.g., Jokela et al., 2010; Jokela & Keltikangas-Järvinen, 2009), but one study found decreases in associations between personality and fertility when controlling for socioeconomic background such as income (Jokela et al., 2011). This might indicate that personality traits affect reproductive decisions via their effect on economic conditions (e.g. finding and keeping a good job) that influence couples' decisions to have children.

Contrary to our expectations, none of our personality measures could predict the decision to have another child. Comparable results were reported by Jokela and colleagues (Jokela et al., 2011, 2009), who found that the effects of personality are most pronounced for the birth of the first child and diminish for the prediction of later births. They concluded from these studies that the same personality traits that influence the decision to have the first child may continue to influence the decision beyond the first child, but the strength of these associations may change with number of children.

We assumed expectations and intentions to be the mechanisms underlying the relationship between personality and fertility outcomes. Although expectations were associated with the intention to become a parent, they could not predict the actual decision. Intention, on the other hand, did mediate the relationship between personality and fertility outcomes, with partners' intention mediating the association between self-esteem and the decision to have the first child. That is, people with insecure partner tend to have a lower intention to have children with that partner, leading to a lower probability of having a child one year later. This partner mediation effect might suggest that the way that partners are perceived as potential parents plays an important role in couples' fertility outcomes. Certain personality traits in a partner might be perceived as characteristic for a good potential parent and therefore increase the intention and likelihood of having children with that partner. This might also be the missing link in the association between males' aggressiveness and couples' decision to have the first child: Women with aggressive men might perceive their partners as less competent potential fathers and therefore refrain from having children with them.

Limitations and Future Research

The present study covered a time span of 1 year. As a result, only the associations with the fertility outcomes could be investigated longitudinally whereas the first part of the model (personality → parenthood expectations → parenthood intentions) had to be tested

cross-sectionally. Future studies with more measurement waves are needed to investigate whether the suggested causal chain really holds. A four-wave design would be optimal to investigate whether Wave 1 personality predicts Wave 2 parenthood expectations, whether these expectations predict Wave 3 intentions and whether intentions predict the actual behavior at Wave 4.

Related to that, the one-year interval between our waves resulted in only 66 couples who had their first child between both waves and 83 couples who became parents again during this time. This required aggregating multiple outcomes (trying to become pregnant, being pregnant, became parents), in order to have enough couples with a positive fertility outcome. These outcomes might represent different levels of decisiveness: People who are trying to become pregnant have consciously made the decision to become a parent, whereas people who are pregnant or had a child might not necessarily have planned to have this child. Future studies should examine whether personality traits, such as conscientiousness, play a differential role in predicting planned versus unplanned pregnancies.

The effect sizes are rather small in the present study, especially with regard to the partner effects. However, the effects on the direct behavior should not be underestimated when looking at the Odds Ratios. For example, the intention of the woman to have a child can quadruple the odds of actually having another child one year later. In addition, when results are interpreted in a broader societal context, a small increase in birth rate can have a major economic impact.

The present study used data from a German panel study. Although these data are representative for Germany, it remains unclear whether results can be generalized to other countries. Previous research provides indirect evidence that results might be similar in other Western industrialized countries and even in some high-fertility non-Western populations. Research in the United States (e.g., Jokela et al., 2011), Finland (e.g., Jokela et al., 2010), and

rural Senegal (Alvergne, Jokela, & Lummaa, 2010) have also found associations between personality and fertility outcomes. In addition, studies in the Netherlands (Liefbroer, 2005) and the United States (e.g., Miller & Pasta, 1994) have found similar associations as in the current study between expected costs and benefits of childbearing and actual outcomes.

Finally, the present study is based on individuals within couples. This raises the question whether results are similar when looking at personality within individuals and how this can be generalized to inform nationwide policy interventions. However, the actor and partner effects found in the present study suggest that personality in couples might be a potential policy target.

Conclusions

This is the first study to use a dyadic longitudinal design in order to investigate the role of both partners in the associations between personality, parenthood expectations and intentions, and fertility outcomes. Findings indicate that personality is associated with all aspects of the decisional process, reaching from expectation about parenthood to intentions and the actual parenthood decision and that it is important to take both partners into account when investigating fertility.

References

Alvergne, A., Jokela, M., & Lummaa, V. (2010). Personality and reproductive success in a high-fertility human population. *Proceedings of the National Academy of Sciences*, *107*, 11745–11750. doi:10.1073/pnas.1001752107

Arnold, F., Bulatato, R. A., Buripakdi, C., Chung, B. J., Fawcett, J. T., Iritani, T., Lee, S. J., et al. (1975). *The value of children: A cross-national study*. Honolulu: University Press of Hawaii.

Bauer, G., & Kneip, T. (in press). Fertility from a couple perspective: A test of competing decision rules on proceptive behaviour. *European Sociological Review*. doi:10.1093/esr/jcr095

Beckman, L. J. (1979). Fertility preferences and social exchange theory. *Journal of Applied Social Psychology*, *9*, 147–169. doi:10.1111/j.1559-1816.1979.tb00801.x

Beckman, L. J. (1984). Husbands' and wives' relative influence on fertility decisions and outcomes. *Population & Environment*, *7*, 182–197. doi:10.1007/BF01255488

Belsky, J. (1993). Etiology of child maltreatment: A developmental ecological analysis. *Psychological bulletin*, *114*, 413–434. doi:10.1037/0033-2909.114.3.413

Cicchetti, D., & Carlson, V. (1989). *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect*. New York: Cambridge University Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.

Coombs, L. C., & Chang, M. C. (1981). Do husbands and wives agree? Fertility attitudes and later behavior. *Population & Environment*, *4*, 109–127. doi:10.1007/BF01255801

Davidson, A. R., & Jaccard, J. J. (1975). Population psychology: A new look at an old problem. *Journal of Personality and Social Psychology*, *31*, 1073–1082.

doi:10.1037/h0076946

Dijkstra, P., & Barelds, D. P. H. (2009). Women's well-being: The role of individual differences. *Scandinavian Journal of Psychology, 50*, 309–315. doi:10.1111/j.1467-9450.2009.00711.x

Eaves, L. J., Martin, N. G., Heath, A. C., Hewitt, J. K., & Neale, M. C. (1990). Personality and reproductive fitness. *Behavior Genetics, 20*, 563–568. doi:10.1007/BF01065872

Fawcett, J. T. (1988). The value of children and the transition to parenthood. *Marriage and Family Review*, *12*, 11–34. doi:10.1300/J002v12n03_03

Feldhaus, M., & Boehnke, M. (2007). Ungeplante Schwangerschaften–Wider das Ideal der Naturbeherrschung? *Kongressband der Deutschen Gesellschaft für Soziologie*. Retrieved from http://www.tess.uni-bremen.de/fileadmin/template/tess/papers/feldhaus_boehnke_2007.pdf

Fishbein, M. (1972). Toward an understanding of family planning behaviors. *Journal of Applied Social Psychology, 2*, 214–227. doi:10.1111/j.1559-1816.1972.tb01273.x

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Hoffman, L. W., & Hoffman, M. (1973). The value of children to their parents. In J. T. Fawcett (Ed.), *Psychological Perspectives on Population*. New York: Basic Books.

Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., & Feldhaus, M. (2011). Panel Analysis of Intimate Relationships and Family Dynamics (pairfam): Conceptual framework and design. *Zeitschrift für Familienforschung*, *23*, 77–101.

Jokela, M. (2010). Characteristics of the first child predict the parents' probability of having another child. *Developmental psychology*, *46*, 915–926. doi:10.1037/a0019658

Jokela, M., Alvergne, A., Pollet, T. V., & Lummaa, V. (2011). Reproductive behavior and personality traits of the Five Factor Model. *European Journal of Personality*, *25*,

487–500. doi:10.1002/per.822

Jokela, M., Hintsa, T., Hintsanen, M., & Keltikangas-Järvinen, L. (2010). Adult temperament and childbearing over the life course. *European Journal of Personality, 24*, 151–166. doi:10.1002/per.749

Jokela, M., & Keltikangas-Järvinen, L. (2009). Adolescent leadership and adulthood fertility: Revisiting the "central theoretical problem of human sociobiology." *Journal of Personality, 77*, 213–230. doi:10.1111/j.1467-6494.2008.00543.x

Jokela, M., Kivimäki, M., Elovainio, M., & Keltikangas-Järvinen, L. (2009). Personality and having children: A two-way relationship. *Journal of Personality and Social Psychology, 96*, 218–230. doi:10.1037/a0014058

Van de Kaa, D. J. (2001). Postmodern fertility preferences: From changing value orientation to new behavior. *Population and Development Review, 27*, 290–331.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist, 39*, 341–350. doi:10.1037/0003-066X.39.4.341

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. The Guilford Press.

Kirk, D. (1996). Demographic transition theory. *Population Studies, 50*, 361–387. doi:10.1080/0032472031000149536

Lesthaeghe, R. (2010). The unfolding story of the second demographic transition. Presented at the Conference on Fertility in the History of the 20th Century - Trends, Theories, Public Discourse, and Policies, Berlin.

Liefbroer, A. C. (2005). The impact of perceived costs and rewards of childbearing on entry into parenthood: Evidence from a panel study. *European Journal of Population/Revue Européenne de Démographie, 21*, 367–391. doi:10.1007/s10680-005-2610-y

Miller, W. B. (1992). Personality traits and developmental experiences as antecedents of

childbearing motivation. *Demography, 29*, 265–285. doi:10.2307/2061731

Miller, W. B., & Pasta, D. J. (1995). Behavioral intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology*, *25*, 530–555. doi:10.1111/j.1559-1816.1995.tb01766.x

Miller, W. B., & Pasta, D.J. (1994). The psychology of child timing: A measurement instrument and a model. *Journal of Applied Social Psychology*, *24*, 218–250. doi:10.1111/j.1559-1816.1994.tb00580.x

Miller, W. B., Severy, L. J., & Pasta, David J. (2004). A framework for modelling fertility motivation in couples. *Population Studies*, *58*, 193–205. doi:10.1111/j.1559-1816.1995.tb01766.x

Mplus. (2012). Chi-square difference testing using the Satorra-Bentler scaled chi-square. Retrieved from http://www.statmodel.com/chidiff.shtml

Muthén, L. K., & Muthén, B. O. (1998). *Mplus User's Guide (6th ed.)*. Los Angeles, CA: Muthén & Muthén.

Nettle, D. (2005). An evolutionary approach to the extraversion continuum. *Evolution and Human Behavior*, *26*, 363–373. doi:10.1016/j.evolhumbehav.2004.12.004

OECD. (2011). SF2.1: Fertility rates. Retrieved from www.oecd.org/dataoecd/37/59/40192107.pdf

Potts, M. (1997). Sex and the birth rate: Human biology, demographic change, and access to fertility-regulation methods. *Population and Development Review*, *23*, 1–39. doi:10.2307/2137459

Rijken, A. J. (2009). *Happy families, high fertility? Childbearing choices in the context of family and partner relationships*. Utrecht University.

Rosenberg, M. (1965). The measurement of self-esteem. In M. Rosenberg (Ed.), *Society and the adolescent image.* Princeton: Princeton University Press.

Schwarz, B., & Gödde, M. (1998). *Dokumentation der Erhebungsinstrumente der 2. Welle.* (No. 29/98). Berichte aus der Arbeitsgruppe Familienentwicklung nach der Trennung. München, Dresden: LMU Munchen, TU Dresden.

Sorenson, A. M. (1989). Husbands' and wives' characteristics and fertility decisions: A diagonal mobility model. *Demography*, *26*, 125–135. doi:10.2307/2061499

Statistisches Bundesamt Deutschland. (2010). Bevölkerung und Erwerbstätigkeit. Natürliche Bevölkerungsbewegung. Retrieved from https://www.destatis.de/DE/Publikationen/Thematisch/Bevoelkerung/Bevoelkerungsbewegung/Bevoelkerungsbewegung2010110107004.pdf?__blob=publicationFile

Statistisches Bundesamt Deutschland. (2012). Geburten in Deutschland. Retrieved from https://www.destatis.de/DE/Publikationen/Thematisch/Bevoelkerung/Bevoelkerungsbewegung/BroschuereGeburtenDeutschland0120007129004.pdf?__blob=publicationFile

Thompson, W. S. (1929). Population. *American Journal of Sociology*, *34*, 959–975. doi:10.1086/214874

Thomson, E. (1997). Couple childbearing desires, intentions, and births. *Demography*, *34*, 343–354. doi:10.2307/3038288

Thomson, E., McDonald, E., & Bumpass, L. L. (1990). Fertility desires and fertility: Hers, his, and theirs. *Demography*, *27*, 579–588. doi:10.2307/3004039

Trommsdorff, G., Nauck, B., & Kallscheuer, C. (2005). *The value of children in cross-cultural perspective: Case studies from eight societies*. Lengerich, Germany: Pabst Sciences.

Vinokur-Kaplan, D. (1978). To have or not to have another child: Family planning attitudes, intentions, and behavior. *Journal of Applied Social Psychology*, *8*, 29–46. doi:10.1111/j.1559-1816.1978.tb00763.x

Table 1

Means, Standard Deviations, and Zero-Order Correlations of all Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SE ♂	-													
2. SE ♀	.13***	-												
3. Shy ♂	-.37***	-.07***	-											
4. Shy ♀	-.06***	-.44***	.05*	-										
5. Agg ♂	-.23***	-.08***	.15***	.04	-									
6. Agg ♀	-.07***	-.28***	.04*	.18***	.11***	-								
7. PE ♂	.09***	-.02	-.07***	.03	-.02	-.02	-							
8. PE ♀	.01	.09***	-.03	-.05*	-.004	-.05**	.23***	-						
9. NE ♂	-.19***	-.10***	.18***	.08***	.17***	.07***	-.09***	-.09**	-					
10. NE ♀	-.09***	-.18***	.07***	.15***	.04*	.20***	-.09***	-.02	.29***	-				
11. Inten ♂	.03	.07**	.002	-.02	-.02	-.06*	.002	.08**	-.13***	-.10***	-			
12. Inten ♀	.05*	.01	-.01	.04	-.01	-.01	.03	.01	-.08**	-.15***	.70***	-		
13. Dec 1st	.06*	.03	-.03	.03	-.06*	-.03	.03	.04	.01	-.02	.32***	.29***	-	

14. Dec add	.01	.05	-.01	-.003	.04	-.01	.02	.01	-.05	-.09**	.31***	.37***	.13***	-
M	4.15	3.93	2.07	2.21	2.27	2.52	3.49	3.49	2.17	2.34	2.77	2.78	159 (10.5)[1]	183 (12.1)
SD	.73	.85	.83	.89	.94	.99	.73	.69	.76	.84	1.01	1.06	-	-

Note. SE = Self-Esteem; Shy = Shyness; Agg = Aggressiveness; PE = Positive expectations; NE = Negative expectations; Inten = Intentions; Dec 1st = Decision to have the first child; Dec add = Decision to have an additional child.

[1] Values for nominal variables refer to the frequency of having a value of 1, percentages between brackets.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2a

Path Coefficients of the Longitudinal Actor Partner Interdependence Models (APIMs)

			Personality trait					
			Model 1: Self-esteem		Model 2: Shyness		Model 3: Aggressiveness	
Effect		Path	*B*	*SE*	*B*	*SE*	*B*	*SE*
Actor	a	Personality --> NE	-.18***	.01	.15***	.01	.15***	.01
Partner	b	Personality --> NE	-.07***	.01	.06***	.01	.03***	.01
Actor	a'	Personality --> PE	.08***	.01	-.05***	.01	-.03**	.01
Partner	b'	Personality --> PE	-.01	.01	.02[1]	.02	-.004	.01
					-.02[2]	.02		
Actor	c	NE --> Intention	-.16***	.02	-.16***	.02	-.16***	.02
Partner	d	NE --> Intention	-.05**	.02	-.07**	.02	-.06**	.02
Actor	c'	PE --> Intention	.03	.02	.02	.03	.03	.03
Partner	d'	PE --> Intention	.03	.03	.03	.03	.03	.03
Actor	e	Personality --> Intention	-.002	.02	.05*	.02	.02	.02
Partner	f	Personality --> Intention	.05*	.02	.02	.02	-.05*[1]	.02

						.02[2]	.02
g	Personality ♂ <--> Personality ♀	.08***	.01	.03*	.01	.10***	.02
h	NE ♂ <--> NE ♀	.16***	.01	.17***	.01	.17***	.01
h'	PE ♂ <--> PE ♀	.12***	.01	.11***	.01	.11***	.01
i	Intention ♂ <--> Intention ♀	.75***	.03	.75***	.03	.76***	.03

Note: N = 2,482 for all models. NE = negative expectations; PE = positive expectations. Columns contain path coefficients from three separate APIMs (i.e., for self-esteem, shyness, and aggressiveness separately).

[1]Path from female variable to male variable [2] Path from male variable to female variable

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

Table 2b

Odds Ratios for Associations with Fertility Outcomes within the Longitudinal Actor Partner Interdependence Models (APIMs)

		Personality Trait					
		Model 1: OR Self-esteem		Model 2: OR Shyness		Model 3: OR Aggressiveness	
	Path	First Child	Additional Child	First Child	Additional Child	First Child	Additional Child
j	Personality --> Fertility outcome	1.17†	1.02	.98	.99	.76***[1] .99[2]	1.10
k	Negative expectations --> Fertility outcome	1.16†	.88	1.13	.88	1.16†	.85*
k'	Positive expectations --> Fertility outcome	1.07	1.01	1.08	1.00	1.07	1.00
l	Intention --> Fertility outcome	2.00***	1.27[1] 3.80***[2]	2.01***	1.28[1] 3.73***[2]	2.01***	1.27[1] 3.84***[2]

Note: N = 2,482 for all models. Columns contain path coefficients from three separate APIMs (i.e., for self-esteem, shyness, and aggressiveness separately).

[1]Path from male variable [2] Path from female variable

$^{\dagger}p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

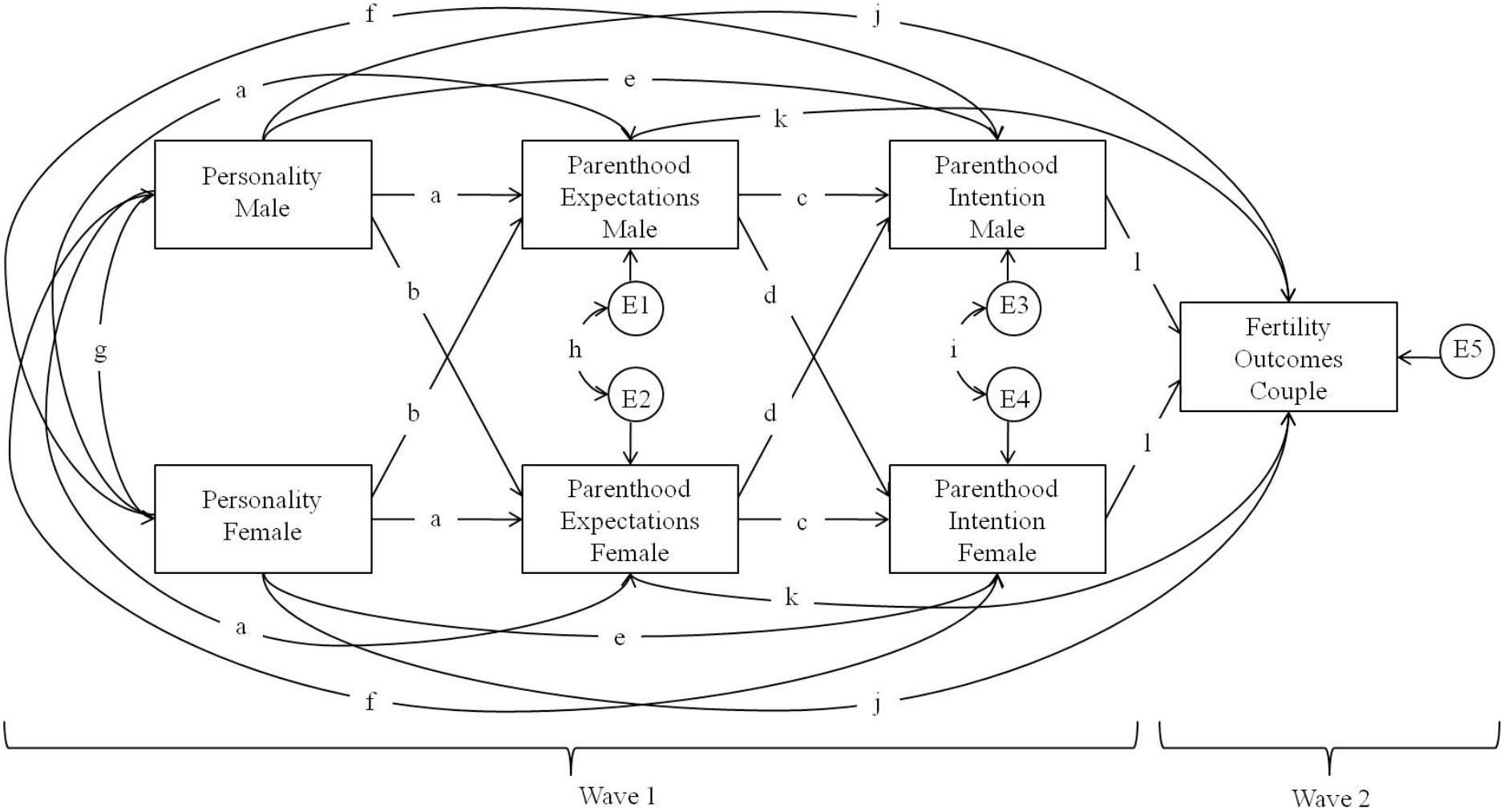

Figure 1. Conceptual Actor Partner Interdependence Model of partners' personality, parenthood expectations, and intentions as predictors of the couple's fertility outcomes. Parameter estimates corresponding with the lower case letters can be found in Table 1. E = measurement error.