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Preferred and Actual Interbirth Intervals in Women with Multiple-Partner Fertility


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Abstract

Objective: Mothers with multiple-partner fertility have longer interbirth intervals (IBI) than mothers with single-partner fertility, suggesting that partner change makes it harder to achieve preferred birth spacing and family planning. Previous studies have, however, overlooked possible differences in preferred IBI length. Here, we investigated how partner change between the first and second child moderates the association between preferred and actual IBI.

Methods: We used retrospective self-report survey data from 728 mothers living in Finland with at least two children.

Results: Mothers with multiple-partner fertility had longer actual IBIs (35 months) than mothers with single-partner fertility (89 months). We found a weaker association between preferred and actual IBI length in mothers with multiple-partner fertility compared to mothers with single-partner fertility when controlling for maternal age, miscarriages, abortions, and in-vitro fertilization.

Conclusions: Our findings support the notion that multiple-partner fertility makes it harder for mothers to achieve their preferred birth spacing, as partner change is associated with considerably longer IBIs. The increased discrepancy in preferred and actual IBIs in mothers with multiple-partner fertility should be considered both in family planning and future studies.

Keywords: interbirth intervals, birth spacing, multiple-partner fertility, partner change, family planning.

Preferred and Actual Interbirth Intervals in Women with Multiple-Partner Fertility

Both longer and shorter interbirth intervals (IBIs) have been associated with various medical and social consequences (e.g., 1,2). Mothers with *multiple-partner fertility* (i.e., who have biological children with more than one partner) report longer IBIs than mothers with single-partner fertility (i.e., who have biological children with only one partner; e.g., 3,4). To our best knowledge, previous studies have, however, failed to consider possible differences in *preferred* IBI length between women with single-partner and multiple-partner fertility. In the present study, we rectified this shortcoming and studied the relationship between preferred and actual IBI length in women with single-partner and multiple-partner fertility.

Interbirth Intervals and Maternal Health

IBI length and medical risks for the mother have been widely studied. Review studies have found that while longer IBIs (i.e., over five years) are associated with, for example, increased risk of preeclampsia and labor dystocia (2), short IBIs are associated with other adverse maternal outcomes, such as pre-pregnancy obesity and gestational diabetes (5), cervical insufficiency (6), uteroplacental bleeding disorders (2,6), and uterine ruptures in cases of previous caesarian section (2,5). The possible associations between short IBIs, maternal death, and anemia are less clear. Taken together, from a medical point of view, both too short and too long IBIs are associated with adverse maternal outcomes.

IBI length can also have economic and social consequences for the mother. For instance, longer IBIs are—quite naturally—associated with more years spent as mothers of dependent children (1,4). Interestingly, increased IBIs seem to be a stronger predictor for a mother spending more years taking care of children than the number of children she has (1). Spending more time taking care of dependent children may, in turn, have considerable consequences for, for instance, the mother's professional career (7) and wage development (8). Moreover, in industrialized countries, one reason for relatively short IBIs is the will to

provide a companion to the first child, as shorter IBIs allow the children to play and develop close relationships with each other during their upbringing (e.g., 9).

Multiple-Partner Fertility and Family Planning

Changes in relationship and childbearing behaviors in Western populations have increased rates of multiple-partner fertility (e.g., 10). For instance, during the 20th century, multiple-partner fertility became more common because of divorce and remarriage (11). During the late 20th and early 21st centuries, nonmarital childbearing has also become more common (12,13). Multiple-partner fertility among mothers from 14 European countries with at least two children has been reported at 7% to 23% (14). Among younger U.S. mothers with two or more children, almost one-third experience multiple-partner fertility (14), and roughly one-tenth of all U.S. adults experience multiple-partner fertility (15).

When it comes to family planning, there seem to be a few things that differ between women with single-partner and multiple-partner fertility. One such thing is IBI length: Studies show that IBIs are, on average, longer for women with multi-partner fertility. For instance, Schwartz et al. (4) found that U.S. women with multiple-partner fertility had IBIs that were, on average, 1.6 years longer compared to women with single-partner fertility. Data from several West European countries similarly show that while the IBI between the first and the second child is around three years for individuals staying with the same partner, the IBI increased from around one and a half years to two years for individuals in new relationships (3). Some variation between countries, likely due to social policies and local norms about dissolving and entering relationships, seems to exist (3).

On the other hand, women who enter a new relationship after having children are more likely to have an additional child than those staying with their partners. Individuals might revise their thoughts on ideal family size as a way of committing to the new relationship (16). This is especially common in relationships where the new partner has no

biological children from previous relationships. Another factor contributing to the higher number of children among those with new partners is that individuals who have unplanned pregnancies are more likely to both form a union with a new partner and have another unplanned pregnancy at some point (17). People with multiple-partner fertility also become parents at younger ages compared to parents with two or more children with only one partner (10,18). Having additional children in new relationships thus seems to decrease the fertility gap between those with and without union dissolutions (e.g., 18).

Preferred and Actual Interbirth Intervals

While multi-partner fertility seems to affect both IBI length and the overall number of children, less is known about the relationship between the mother's preferred and actual IBIs in cases of multi-partner fertility. Given that the length of the IBIs can affect the mother's well-being in various ways, effective family planning requires a better understanding of how mothers who change partners after having a child manage to space the births in accordance with their preferences.

The Current Study

In a group of Finnish women, we investigated how changing the partner between the birth of a first and a second child is associated with IBI length and how such a change moderates the expected positive association between preferred and actual IBI. Moreover, we investigated whether changing partners was associated with the total number of children and the age of becoming parents.

To do this, we asked women to report their preferred IBI and their actual IBI for the first and second child, whether these two children had the same father, and the total number of children they had. As control variables, we also asked women to report miscarriages and abortions between these two births and whether any of the two children were conceived through in-vitro fertilization.

We expected a positive association between preferred and actual IBI, and that changing partners would lead to longer actual IBI and weaken the association between preferred and actual IBI. However, based on previous literature, we expected that changing the partner would be associated with having more children and becoming parents at a younger age.

Methods

Ethical Permission

The Board for Research Ethics at [UNIVERSITY BLINDED FOR REVIEW] granted ethical permission for the current study before data collection began. All participants gave their informed consent per the Helsinki declaration before participating in the study. They were informed that participation is voluntary and that they can terminate their participation at any point during the survey.

Participants and Procedure

We collected data for five consecutive days in April 2020. Our participants were women aged 18 to 60 with at least two biological children (excluding twins). We recruited participants through a Facebook advertisement targeting adult women living in Finland. After completing the survey, participants were invited to a separate questionnaire where they could fill out their e-mail addresses to participate in a lottery of a 100€ gift card to a multi-brand online shop. A total of 738 women completed the survey (completion rate 64.0%). With respect to the questions used in the current study, 729 mothers responded to all items. One of these respondents had an illogical response on the items assessing whether the children had the same biological father (i.e., reported that their first two children had a different father, that their second and third child had the same father, and that the third and first child had the same father), and was therefore excluded from the analyses. This resulted in a final study

sample of 728 mothers. Their mean age was 41.3 years ($SD = 9.2$, range 22–60, age data were missing from four individuals).

Measures

The present study was part of a larger data collection on infant and maternal well-being postpartum. We first asked the mothers to provide some background information about themselves (age, relationship status). We then asked the mothers to report the number of biological children. Based on this, participants were asked more detailed questions regarding the two (mothers with only two children) or three oldest children (all other mothers). In the present study, we used the following descriptive information regarding the two (oldest) children and the IBI between them: child sex, breastfeeding, contraceptive use, miscarriages, abortions, and in-vitro fertilization. We also asked the participants to report whether their two (oldest) children had the same biological father (yes/no). We measured the actual IBI as the number of months between the births of their two (oldest) children. We measured the preferred IBI with the following question: “Before you had your first child, what was your preferred time in between births if you were to have more than one child? Please answer in number of years.”

Statistical Analyses

The statistical analyses were conducted using SPSS 28.0 for Mac. To answer our research questions, we conducted a multiple regression with actual IBI as the dependent variable, preferred IBI and partner change ($yes = 1$; $no = 0$) as independent variables, and an interaction term for preferred IBI and partner change. We also included the following control variables: age, miscarriage(s), abortion(s), in-vitro fertilization for the first child, and in-vitro fertilization for the second child. We centered the preferred IBI by deducting the mean from each individual observation. We created a variable for the interaction by computing the product of the binary variable for partner change and the continuous variable for preferred

IBI. We calculated the approximate age for becoming parents by subtracting the age of the first child (calculated by subtracting the child's birth month and year from the month and year of data collection) from the mother's age (reported in years).

Results

Descriptive statistics are presented in Table 1.

Table 1

Descriptive Statistics for the Mother, the two First Children, and Their Interbirth Interval

Variable	<i>n</i>	%
Mother's partner change after first child		
Yes		11.7
No		88.3
Mother's relationship status		
Married/cohabiting with (one of) the children's biological father(s)		74.9
In a relationship with (one of) the children's biological father(s)		0.7
Married/cohabiting with someone other than the children's biological father		5.6
In a relationship with someone other than the children's biological father		6.5
Single		12.4
Number of children		
2		59.5
3		23.6
4		9.9
5 or more		7.0
First child's sex		
Female		49.0
Male		50.5
Other		0.4
Second child's sex		
Female		47.5
Male		52.1
Other		0.4
Breastfeeding ^a		90.5
Use of contraceptives		57.0
Miscarriage(s) ^b		16.3
Abortion(s) ^c		3.0
In-vitro fertilization		
First child		2.9
Second child		2.5

Note. $N = 728$. Breastfeeding, use of contraceptives, miscarriage(s), and abortion(s) are reported for the interbirth interval between the first and second child. ^a Mean duration 11.0 months ($SD = 7.7$). ^b Mean number of miscarriages 1.3 ($SD = 0.8$). ^c Mean number of abortions 1.1 ($SD = 0.4$). Mean duration and numbers were calculating based on those responding yes.

Preferred and Actual Interbirth Intervals

Table 2 displays the mean actual and preferred IBI, as well as their standard deviation and range. Figure 1 shows a scatter plot of actual IBIs and preferred IBIs. The participants reported an average preferred IBI of approximately two years and five months. Their actual IBI was, on average, approximately three years and four months. The longest actual IBI was 18 years and six months. There was a positive correlation between preferred and actual IBI, $r = .33, p < .001$.

Table 2*Preferred and Actual Interbirth Intervals for Mothers with and without Multiple Partner Fertility*

Variable	<u>All Mothers</u>					<u>Mothers with MPF</u>					<u>Mothers without MPF</u>				
	<i>N</i>	<i>M</i>	<i>SD</i>	Min	Max	<i>N</i>	<i>M</i>	<i>SD</i>	Min	Max	<i>N</i>	<i>M</i>	<i>SD</i>	Min	Max
Preferred IBI	728	28.66	11.33	12	120	86	34.74	18.95	12	120	642	27.87	9.60	12	120
Actual IBI	728	39.82	29.08	11	222	86	83.01	48.13	15	222	642	34.08	19.28	11	164

Note. MPF = Multiple-partner fertility; IBI = Interbirth Interval; Four outlier values for preferred IBI were winsorized.

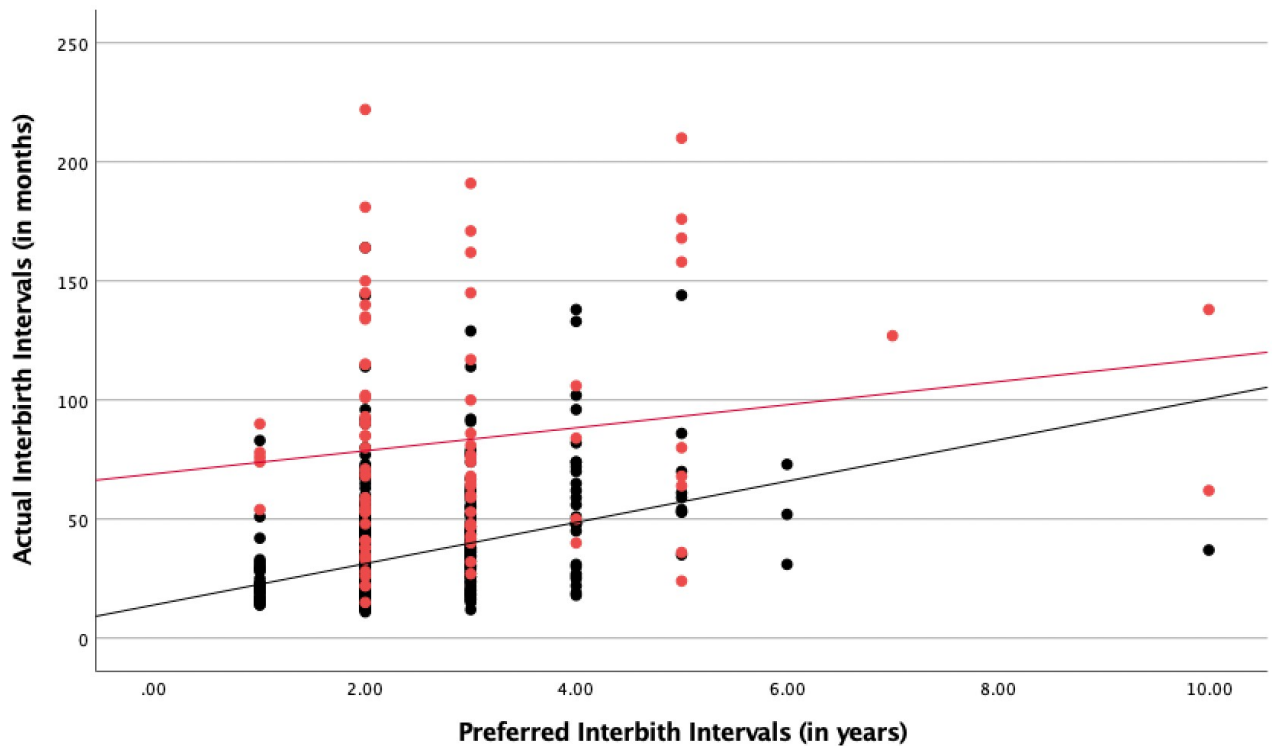


Figure 1. Scatter plot of actual interbirth intervals (IBIs; in months) and preferred IBIs (in years). Partner change between the first and second births (i.e., multiple-partner fertility) is represented by red dots; no partner change between the first and second births (i.e., single-partner fertility) is represented by black dots.

Partner Change and Interbirth Intervals

Next, we conducted two multiple regressions to investigate the association between partner change and preferred IBI (as well as their interaction term) on actual IBI. In the first model, we only included the aforementioned predictors. In the second model, we also included important control variables, such as maternal age, miscarriages, abortions, and in-vitro fertilization. Results from the two multiple regressions are presented in Table 3.

Table 3

Multiple Regression Models for Partner Change and Interbirth Intervals

Predictor	Model 1				Model 2			
	<i>b</i>	<i>SE</i>	<i>p</i>	β	<i>b</i>	<i>SE</i>	<i>p</i>	β
Constant	34.67	0.93	< .001		21.44	3.87	< .001	
Age					0.27	0.91	.004	.09
Miscarriage					12.29	2.30	< .001	.16
Abortion					23.53	5.23	< .001	.14
In-vitro fertilization for 1 st child					-3.35	6.72	.618	-.02
In-vitro fertilization for 2 nd child					1.21	7.32	.868	.01
Partner Change	45.90	2.82	< .001	.51	39.30	2.93	< .001	.43
Preferred IBI	8.66	1.16	< .001	.28	8.40	1.13	< .001	.27
Partner Change x Preferred IBI	-3.82	1.99	.055	-.07	-3.94	1.94	.043	-.08

Note. IBI = Interbirth interval. Model 1: adjusted $R^2 = .35$; Model 2: adjusted $R^2 = .38$.

In the first model, 35% of the variance in actual IBI could be explained by the three predictors, $F(3, 724) = 131.24, p < .001$). As expected, the preferred IBI was associated with the actual IBI. We also found that partner change was associated with a longer actual IBI. Albeit the association between preferred and actual IBI was somewhat weaker in cases of partner change, we found no formal evidence of an interaction ($p = .055$). In cases of no partner change, the constant was 34.67 months, and the influence of preferred IBI was such that for each year, the actual IBI increased with, on average, 8.66 months. In the case of partner change, the constant was 80.57 months, the slope was not as steep, and one year of increased preferred IBI was associated with a 4.84-month longer actual IBI.

In the second model, 38% of the variance could be explained by all included predictors, $F(8, 723) = 57.37, p < .001$. As would be expected, both miscarriages and abortions between the first and the second child were associated with longer actual IBIs. Older mothers also reported longer actual IBIs. In-vitro fertilization was not associated with longer actual IBIs. Again, both partner change and preferred IBI were associated with actual IBI. When controlling for age, miscarriage(s), abortion(s), and in-vitro fertilization, the interaction was statistically significant ($p = .045$). The coefficients were similar to those of the first model.

Partner Change, Number of Children, and Age of Becoming Mothers

After this, we investigated whether partner change was associated with the number of children. Comparing women who had changed partners between their first and their second child to women who had not, we found that those who changed partners ($M = 2.88$, $SD = 1.01$) had more children than those who did not ($M = 2.62$, $SD = 0.91$), $t(726) = 2.55$, $p = .011$, $d = .92$. In both groups of women, actual IBI was negatively correlated with the number of children. For women who had changed partners between their first and their second child, the correlation was $r = -.26$, $n = 86$, $p = .016$. For women who had not changed partner, the correlation was $r = -.19$, $n = 642$, $p < .001$. Women who had changed partners between their first and their second child were on average significantly younger when they became mothers ($M = 23.2$ years, $SD = 4.5$) compared to those who had not ($M = 26.8$ years, $SD = 4.8$), $t(722) = 6.49$, $p < .001$, $d = .76$.

Discussion

In a sample of 728 mothers living in Finland, we investigated if changing partners between the first and second child was associated with a longer interbirth interval (IBI) and a weaker association between preferred and actual IBI. We also investigated how partner change and actual IBI were associated with the total number of children and the age of becoming mothers.

As expected, we found that the actual IBI length was considerably (almost by a full year) longer than the preferred IBI length. This difference could, of course, be due to many different things that make it difficult for women to plan their reproduction. Yet, there was a positive association between preferred and actual IBI. This seems to indicate that women, at least in some cases, manage to reproduce with IBIs that reflect their preferences.

Partner Change and Interbirth Intervals

We also found that changing partners between the first and the second child was associated with longer actual IBIs. In fact, women who changed partners had, on average,

almost 50 months longer actual IBIs than women who did not change partners. This result is consistent with previous literature, which also shows that women with multiple-partner fertility have longer IBIs than women with single-partner fertility (e.g., 3,4).

We found evidence for a weaker association between preferred and actual IBI length in mothers with multiple-partner fertility. Thus, it seems more difficult for mothers with multiple-partner fertility to achieve their preferred IBI length compared to mothers with single-partner fertility. This might have several negative economic and social consequences, as longer IBIs are associated with, for instance, more years spent as mothers of dependent children (1,4). This may, in turn, have a negative impact on the professional career (7) and wage development (8) of mothers with multiple-partner fertility. Longer IBIs might also have consequences on family dynamics, as shorter IBIs allow siblings to play and develop closer relationships with each other during their upbringing (e.g., 9). As such, the discrepancy between the preferred and actual IBIs among mothers with multiple-partner fertility is valuable information when developing family planning support. Future studies could study the reasons for this discrepancy in greater detail.

Partner Change, Number of Children, and Age of Becoming Parents

In line with previous research, we found that women with multiple-partner fertility had more children than those with single-partner fertility. A shorter actual IBI was associated with having more children both in women with multiple-partner and single-partner fertility. The women with multiple-partner fertility were, however, approximately three years younger when they became parents, explaining why women with multiple-partner fertility had more children, although their IBIs were longer. This result is also in line with previous research, showing that people with multiple-partner fertility become parents at younger ages compared to parents with single-partner fertility (10,18).

Limitations

There are some important methodological limitations to the current study. Most importantly, the design was not longitudinal, making it difficult to draw firm conclusions about causality; it cannot be ruled out that women with more difficulties fulfilling their preference for a short IBI are more likely to change partners to better succeed in achieving their preferred IBIs. Asking the participating women to report the reason for changing partners would have helped clarify the causal direction.

Second, the current study only included mothers with at least two children: Our study does not provide information about the preferred and actual IBI length of those who had had a union dissolution after their first child but did not have a second child at the time of our study. The association between preferred and actual IBI length likely differs when taking these women into account. It is also worth noting that we only looked at the IBI between the first and the second child. Most families with children in Finland have only one or two children (20). However, some studies suggest that, at least in some Western European countries, union dissolutions are more common after the second child (3).

Together with other Nordic countries, Finland stands out with generous parental leave policies and social support (21), possibly reducing the generalizability of our results. It might be easier for women with multiple-partner fertility to achieve their preferred IBI when ample social support is available, making it easier to find the time and energy for an additional child. Finland also has a relatively high percentage of nonmarital births (3), possibly reducing the generalizability to countries with more conservative norms about union dissolutions.

Conclusions

In the present study, we found evidence for a weaker association between preferred and actual IBI length in mothers with multiple-partner fertility, suggesting that mothers with multiple-partner fertility have a more challenging time realizing their preferred IBI length compared to mothers with single-partner fertility.

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