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CHANGING FERTILITY PREFERENCES IN TÜRKİYE: ANALYSES BY PARITY

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Abstract

The aim of this study is to examine changes in fertility ideals and intentions of women and fertility gap at both macro and micro level for the 1993-2018 period using data of Turkey Demographic and Health Surveys (TDHS), and to analyze fertility intentions of currently married women by parity, i.e. number of children ever born, using 2018 TDHS data employing descriptive and logistic regression methods. According to the findings, while ideal number of children increased in the 25-year period, intended number of children decreased. Although fertility gap is positive when using conventional TFR, it is negative when adjusted TFR is used, meaning actual fertility is greater than ideal or intended number of children. There has been an increase in the level of pronatalism in Türkiye recently, but it would be wrong to conclude that this is reflected in intentions and behaviors. Our multivariate findings covering all parities show that age and child-related variables are important determinants of women's fertility intention. Additionally, region, mother tongue and use of contraceptive methods are important. Socioeconomic variables, however, were not found to be significantly associated with birth intention. Some of these were found to be significant in intention for progression to first- and second-births.

Key Words: *Fertility, Ideal fertility, Intended fertility, Fertility gap, Total fertility rate, Tempo adjusted total fertility rate, Türkiye, TDHS*

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TÜRKİYE'DE DEĞİŞEN DOĞURGANLIK TERCİHLERİ: PARİTEYE GÖRE ANALİZLER

Öz

Bu çalışmanın amacı, Türkiye Nüfus ve Sağlık Araştırmaları (TNSA) verilerini kullanarak 1993-2018 dönemi için kadınların doğurganlık idealleri ve niyetlerindeki ve doğurganlık farkındaki değişimleri hem makro hem mikro düzeyde incelemek ve 2018 TNSA verisi kullanılarak halen evli kadınların doğurganlık niyetlerini, parite yani sahip olunan çocuk sayısına göre hem betimsel hem de lojistik regresyon yöntemiyle incelemektir. Bulgulara göre 1993-2018 arası 25 yıllık dönemde ideal çocuk sayısı artarken, istenilen çocuk sayısı azalmıştır. Doğurganlık farkı geleneksel TDH kullanıldığında pozitif olmasına rağmen, düzeltilmiş TDH kullanıldığında negatif olmaktadır, yani gerçekleşen doğurganlık, ideal veya istenilen çocuk sayısına kıyasla daha fazladır. Yakın zamanda Türkiye'de pronatalizm seviyesinde bir artış olmuştur, ancak bunun niyet ve davranışlara yansıdığı sonucuna varmak yanlış olacaktır. Tüm pariteleri kapsayan çok değişkenli bulgularımız ise yaş ve çocukla ilgili değişkenlerin kadınların çocuk sahibi olma isteğinin önemli belirleyicileri olduğunu göstermiştir. Ayrıca bölge, anadil ve gebeliği önleyici yöntem kullanımı önemli belirleyicilerdir. Sosyoekonomik değişkenler ise çocuk sahibi olma niyeti ile anlamlı olarak ilişkili bulunmamıştır. Bu değişkenlerin bazıları birinci ve ikinci doğuma geçiş niyetinde anlamlı olarak bulunmuştur.

Anahtar Kelimeler: *Doğurganlık, İdeal doğurganlık, İstenilen doğurganlık, Doğurganlık farkı, Toplam doğurganlık hızı, Zamanlamaya göre düzeltilmiş toplam doğurganlık hızı, Türkiye, TNSA*

INTRODUCTION

Fertility preferences is an umbrella term that encompass several concepts such as fertility ideals, intentions, desires, expectations and aspirations. Fertility preferences is a hypothetical concept which may or may not be reflected in fertility outcomes, and the outcome varies depending on which concept is used. Among the concepts, realization of intentions is more likely (for ex. Schoen, et al., 1999); while fertility ideals —when measured accurately— reflect the degree of pronatalism in the society. Fertility gap, which is the difference between hypothetical and actual fertility, on the other hand, can be a basis for various population and family planning policies. However, before making any policy inferences, the measures and definitions used should be accurately selected and the technical assumptions should be clearly stated. For all these reasons, it is important to study fertility preferences with the right methods. The aim of this study is to make an accurate demographic analysis of fertility preferences and the fertility gap in Türkiye, to reveal their recent changes by using 1993, 1998, 2003, 2008, 2013 and 2018 Turkey Demographic and Health Surveys (TDHS) data, and to analyze the determinants of future fertility intentions by the number of children (parity). To the best of our knowledge, the only study where similar indicators were calculated was Abbasoğlu Özgören et al.'s (2022), which was a chapter in UNFPA and HUIPS's report in Turkish. In this study at hand, the actual fertility indicators and multivariate analyses are improved. Furthermore, Gemicioğlu et al. (2019), estimated mean number of total intended number of children for currently married women pooling 2008 and 2013 TDHS surveys data. However, the research questions and method of the study at hand is totally different, where different assumptions are used and the indicators are re-calculated covering more years and all women in some parts.

Recently, there have been changes in the fertility preferences in Türkiye. One of the most noteworthy findings of 2013 TDHS and 2018 TDHS is the change in ideal number of children. Ideal number of children, which was 2.4 in 1993, increased to 2.7 in 2013 and 2.8 in 2018. Among currently married women, this level has reached 3.0 by 2018. In terms of ideal fertility, 2-child norm was prevalent in 1990s whereas in 2010s almost 3-child norm was reached and this development needs to be analyzed further. Another important

development was the change in the share of women who want to limit their childbearing. This share was around 60% until 2008 TDHS, whereas declined to 47% at the time of 2013 TDHS. Although this proportion increased to 53% in 2018, the proportion of women who want to limit childbearing has not returned to its 2008 level (Abbasoğlu Özgören et al., 2022; HUIPS 1994; 1999; 2004; 2009; 2014; 2019). Considering that the total fertility rate has recently stabilized at 2.3 according to the TDHS data, this increase in hypothetical fertility preferences has led to an increase in the fertility gap, when measured in its simplest form. However, as will be shown in this study, when more detailed and accurate calculations are made, it is seen that the fertility gap (hypothetical-actual fertility) is not positive but negative on the contrary.

The "3 child policy" (*Hürriyet*, 7 March 2008) first mentioned by then Prime Minister Recep Tayyip Erdoğan in March 2008 and the pronatalist policies that were put on the public agenda later on[3] may have an impact on the increase in fertility preferences in Türkiye. Although an impact evaluation of these policies is not within the scope of this study, we think that the backdrop of such policies provides justification for studying trends in fertility preferences in the country.

The next section explains the concepts related to fertility preferences and presents selected literature on the subject. In the following chapter, the data and method used in the study are detailed. Later, there are the results of the trends in fertility preferences including the period 1993-2018 with both macro and micro approaches and multivariate analysis of the future fertility plans. The last chapter presents the discussion, conclusion and suggestions for future work.

[3] Some of these policy documents are: the Tenth Five-Year Development Plan (2014-2018) (MoD, 2014); the plan of action of January 2015 by the Ministry of Development and Ministry of Family and Social Policies titled, "Family and Dynamic Population Structure Conservation Program" (MoD and MoFSP, 2015), and the Eleventh Five-Year Development Plan (2019-2023) (Presidency of the Republic of Türkiye, Presidency of Strategy and Budget, 2019).

LITERATURE REVIEW[4]

Concepts of Fertility Preferences

Ideal Fertility

The term "ideal number of children" was first introduced in 1936 by George Gallup with a poll question designed to measure attitudes towards fertility and population growth: "What do you think is the ideal number of children for a family to have?" (as cited in Philipov and Bernardi, 2012). As seen, the concept of an ideal is ambiguous by nature, and fertility ideals may reflect either the best number of children or the best living conditions for a family. During the post-Second World War baby boom, the ideal number of children in the U.S. did not deviate greatly from actual fertility and ideal number was used as a measure of expected fertility. However, as actual fertility later started to decline, becoming much more divergent from ideal fertility, this interpretation was left out and the idea of using attitudes towards fertility ideals as an indicator of future behavior was generally abandoned (*ibid*). In the 1960s, the expression "ideal number of children" was interpreted as family-size norms, or societal norms about the number of children in a family. The question of ideal fertility may reflect personal or societal ideals based on its formulation. A personal ideal is anchored to the respondent's specific family situation, whereas in societal ideal the reference point is the average family. The concept of "fertility ideal" is useful as it provides insight into social norms, tests theories of microlevel fertility decision-making, and can assist in the evaluation of theories of fertility decline (Ray et al., 2018). Moreover, fertility ideals may be associated with actual fertility albeit to a lesser extent compared to other concepts of fertility preferences.

Intended Fertility

In 1955, a fertility intention question was designed for the first National Fertility Survey in the U.S. in order to gather information that would improve population forecasts (Westoff and Ryder, 1977 as cited in Philipov and Bernardi, 2012). Respondents of reproductive age were asked whether they intended to have more children, and if so, how many.

[4] In this section, compilations of Abbasoğlu Özgören et al. (2022) are used.

Two main types of fertility intentions are studied in the literature: Lifetime intentions and short-term intentions. Short-term intentions cover intentions to have a child in 2- or 3-years' time and provide a more accurate picture of actual fertility as expected. Another differentiation in fertility intentions can be made between quantum intentions (intended family size) and parity progression intentions (intentions to have a/another child). Quantum intentions are synonymous to lifetime intentions while parity-progression intentions can be restricted to a specified time frame (Balbo et al., 2013).

Contrary to the interchangeable use of fertility ideals and fertility intentions in many studies, the two are indeed different concepts (Chen and Yip, 2017; Philipov and Bernardi, 2012). Fertility ideals or desires refer to preferred number of children when barriers to childbearing are ignored (Miller, 2011; Miller and Pasta, 1993; 1994; 1995), while fertility intentions reflect the existence of a plan of action, constrained by socioeconomic circumstances (Miller, 2011). Hence total intended number of children are expected to be lower than the ideal number of children. Theoretically, ideal and intended number of children are linked (Liefbroer et al., 2015).

Fertility Gap

The concept of the "fertility gap" was first used in the 1950s and 1960s when the ideal number of children measure exceeded actual fertility. Later, as a measure of hypothetical fertility, intended or expected number of children replaced the ideal number of children. Fertility gap has been used to legitimize the need for policies. However, its measurement is directly dependent on the way hypothetical and actual fertility are measured (Philipov and Bernardi, 2012; see Equation 1). For this reason, it is important to measure and interpret the fertility gap accurately when making policy implications.

Fertility gap= Hypothetical fertility – Actual fertility (Eqn. 1)

Actual fertility is commonly calculated as the total fertility rate (TFR). Total fertility rate is defined as the average number of live births a woman would have through her reproductive age if she were subject, throughout her life, to the age-specific fertility rates observed in a given year or period. Its calculation assumes that there is no mortality. It is computed by the summation of

the series of age-specific fertility rates constituting the fertility schedule and it represents a synthetic measure of fertility (Demopædia, 2021). As seen, total fertility rate (TFR) is a period measure. In fertility measures and changes, two dimensions are observed: tempo and quantum. TFR is a quantum measure that is affected by timing changes. Timing changes in fertility affect TFR which is a period measure. For instance, although the total number of children a woman will have may not change, she may postpone her fertility in times of an economic crisis or a pandemic. In such case, mean age at childbearing would change and TFR would decline albeit temporarily. However, *tempo adjusted fertility* clears these tempo distortions, reflects the *quantum* dimension, and is more stable through time. It should be noted that tempo adjusted TFR is also a period measure and not a cohort one.

According to Lutz (2007), if one wishes to compare desired fertility to a period fertility measure, s/he should use tempo adjusted TFR, which clears the tempo (i.e., timing) effects, and represents the fertility level at which births were not postponed to later ages or did not take place at earlier ages. Similar suggestions were made by Sobotka and Lutz (2010), Liefbroer et al. (2015) and Philipov and Bernardi (2012).

Another comparison would be between a cohort's intended number of children in their prime reproductive years and their actual completed fertility but this comparison has more data requirements, refers to an earlier period and offers similar conclusions with adjusted period analyses (see Sobotka and Lutz, 2010 and Beaujouan and Berghammer, 2019 for examples of the cohort approach).

A comparison of period and cohort perspectives is made by Philipov and Bernardi (2012: 518-519), who argue that "*Under the cohort perspective, actual fertility is measured with the observed completed number of children, but in this case living conditions are not consistent. Under the period perspective, the TFR and the adjusted TFR can be compared with the hypothetical fertility, under one and the same set of living conditions… The cohort perspective might be applied when information about future fertility is needed, while the application of the period perspective is preferable for the inference of policy-relevant implications because both components of the gap are measured under one and the same living conditions*".

Hence, to obtain policy relevant implications, in this study at hand, we use the period perspective in our analyses, using TFR and adjusted TFR to measure actual fertility although a cohort analysis is also possible using TDHS series.

Selected Empirical Literature

This section presents important empirical studies that influenced our study and that analyze fertility preferences in Türkiye.

Chen and Yip (2017) analyzed declining fertility preferences indicators of currently married women using 2012 KAP (Knowledge, Attitude and Practice) survey data for Hong Kong. Chen and Yip's (2017) study is important for its similarity to our study at hand (see Section on Methodology). Chen and Yip (2017) have found that fertility intentions and their determinants differ by actual parities in the context where ideal number of children is below 2-child norm. Marital life satisfaction, household income, good communication with husbands regarding childbearing are found to be positively associated with first-birth intensions while part-time employment of women is negatively associated with second-birth intentions. The factors that are negatively associated with third-birth intentions, on the other hand, are women's full-time employment and gender inequality in the division of housework. Another important finding of this study is that an influential determinant of birth intention is ideal number of children. Ideal fertility is found important especially in the first- and second-birth intentions.

Studies on fertility preferences in Türkiye are relatively small in number but recent. First of these studies is Çağatay et al.'s (2015), which analyze the factors associated with changes of decisions for women who want to limit childbearing or are indecisive about their intention to have another child. According to the results of this study which uses 2013 TDHS data, some 33% of currently married women would change their intention in favor of childbearing. Logistic regression analyses suggested that the most common determinants of this decision change were the gap between ideal and actual number of children and the sex composition of living children. Also analyzed were the determinants of childbearing intentions among currently married women in different age groups. Similar determinants were found to be significant in these models, too. Later, Eryurt (2018) analyzed the trends in TFR and ideal number

of children in Türkiye from 1963 to 2013 with a descriptive methodology. He pointed out differentials in TFR, mean ideal number of children, and the fertility gap between subgroups of female population. Another important study is of Gemicioğlu et al.'s (2019). Similar to Schoen et al. (1999), in this study, the importance of fertility intention in actual fertility predictions was emphasized and its empirical effect was shown. 2008 and 2013 TDHS data were pooled and for the first time, the total intended number of children was calculated for currently married women. Finally, the study of Abbasoğlu Özgören et al. (2022), which was published in Turkish as a HUIPS and UNFPA book chapter involves detailed analyses on fertility preferences in Türkiye covering the period of 1993-2018. Abbasoğlu Özgören et al. (2022) estimated various indicators of fertility preferences (ideal, intended fertility and some fertility gap indicators) for the period of 1993-2018 considering several dimensions for the first time and analyzed birth intentions of currently married women regardless of parity dimension, employing multivariate logistic regression model using 2018 TDHS data. Abbasoğlu Özgören et al.'s (2022) study is a first in that it calculates the total intended number of children for both all and currently married women using all TDHS separately, and is one of the few studies that considers fertility preferences as an output variable.

The study at hand, differently from Abbasoğlu Özgören et al.'s (2022), improved estimations of tempo adjusted TFR with up-to-date methods and differentiated multivariate analyses in terms of actual parity of women. In this sense, the multivariate analysis method of this study is similar to Chin and Yip's (2017) model (see Section on Methodology).

DATA AND METHODOLOGY

Data

Data on fertility preferences are primarily obtained from demographic surveys. In Türkiye, the Turkey Demographic and Health Survey (TDHS) series provide valuable information related to fertility preferences. In this study, data from all TDHS surveys to date are used, including the 1993, 1998, 2003, 2008, 2013, and 2018 TDHS datasets. TDHS samples, which are representative at the national level, were designed with a weighted, multi-stage, stratified cluster sampling approach. In general, two main questionnaires were applied in these

surveys: The Household Questionnaire and Woman's Questionnaire. The Woman's Questionnaire collected information from eligible women aged 15-49 in these households. The definition of eligibility differed over time. Before 2013 TDHS, only ever-married women were included for the core Woman's Questionnaire[5], and since the 2013 TDHS all women including never married women are covered. Informed consent was obtained from respondents before application of each questionnaire.

In TDHS', information on fertility preferences were collected with the following questions:

Ideal number of children:

"*If you could go back to the time you did not have any children and could choose the exact number of children to have in your whole life, how many would that be?*" For those with no living children, the question was "*If you could choose the exact number of children to have in your whole life, how many would that be?*".

Women who were not sterilized and whose partners were not sterilized were asked their fertility intentions in the forms of both the parity progressions and quantum intentions:

The parity progression intention: *"Would you like to have (a/another) child, or would you prefer not to have any (more) children?"* (was asked with a different version for currently pregnant women).

Quantum intention: To the ones who answered *"Yes"* to the question above *"How many more children would you like to have in the future?"* (was asked with a different version for currently pregnant women).

Timing of the intended birth: *"How long would you like to wait from now on, before the birth of (a/another) child?"* (was asked with a different version for currently pregnant women).

Methodology

In this study, both descriptive macro level analyses and analysis of fertility intentions with a multivariate method at the micro level were carried out.

[5] except in 1998 TDHS, where never-married women were also included.

While IBM SPSS Statistics 21 version was used in descriptive analyses, Stata/MP 14.1 program was used in multivariate analysis.

In the macro analyses, we included all women including both never married and ever married ones, while in the other analyses, we used women who are currently married. The analytical sample has changed according to the indicator and analysis used, and the relevant notes are given below the tables/figures.

Details of the methods used in the different stages of the analyses are described below.

Estimation of Total Intended Number of Children

In this section, the assumptions used in calculating the total intended number of children are explained in detail. As stated in section of the Selected Empirical Literature, the total intended number of children for Türkiye was first estimated by Gemicioğlu et al. (2019) who pooled 2008 and 2013 TDHS data only for currently married women. Abbasoğlu Özgören et al. (2022), on the other hand, calculated the total intended number of children for both all women including never married women and currently married women, using all TDHS data separately, thus providing a trend analysis. This study at hand is based on the approach and assumptions of Abbasoğlu Özgören et al. (2022).

Total intended number of children is calculated as follows:

Total intended number of children = Actual number of children + Intended number of children (Eqn. 2)

For some women groups, it is necessary to make assumptions when calculating (Eqn. 2). These groups of women and our assumptions are as follows:

(1) Undecided women: It is an important issue how women who are undecided about intending to have another child in the future will be handled in the calculation of the intended number of children. Morgan (1982) argues that indecisive answers bring important information for measuring fertility preferences and therefore should not be excluded. In the Fertility and Family Surveys (FFS), it was assumed that those with uncertain expectations were likely to have unrealized fertility goals, hence they should have been added to the answer "no" (i.e. no birth intention) (as cited in Philipov and Bernardi,

2012). Using different approaches, Sobotka (2009) calculated the total intended number of children for Austria as three different variants, with varying assumptions about undecided women: (1) medium variant (if a range is specified, the midpoint of the range; if no such range is provided, it is assumed that the respondents want no more children), (2) high variant (excludes all undecided respondents but includes the ones who specified a range), (3) low variant (the assumption that women who are undecided about how many children they intend to have in the future do not want any more children regardless of whether they specify a range or not). According to Sobotka's (2009) findings, similar to Morgan's (1982) study, excluding undecided women from analysis (high variant) leads to biased and less likely outcomes[6]. On the other hand, the low variant gives results very close to the eventually achieved family size for women (Sobotka, 2009).

Based on all these findings, we assumed that the intended number of children, which is the second component of equation (2), as "0" for women who answered "undecided/don't know" to the question of whether they want to have other children in the future. Women who want to have children in the future but do not give numerical answers when asked about the number (God knows, it doesn't matter, etc.) were excluded from the analysis in the calculation of the total intended number of children.

(2) Women who are unable to conceive:

(2.a) (Sterile) Women who had tubal ligation or hysterectomy operation:

In almost all studies, sterile women, mainly those who had been sterilized for contraceptive purposes, have been included in the analyses and "0" additional intended number of children is assumed for them (Erfani, 2017; Morgan, 1982; Ryder, 1976; Westoff, 2010). Women sterilized for medical reasons rather than contraceptive reasons (for instance women who had hysterectomy operation), were excluded in Ryder's study (1976). Since such a differentiation of sterilization is lacking in most surveys, general practice is to include sterile women in the analysis and assume a "0" intended number of children for

[6] Gemicioglu et al. (2019) excluded women who were undecided, unable to conceive, and did not answer the question. Gemicioğlu et al.'s (2019) calculation of the total intended number of children differs from our study due to its different assumptions.

them, i.e. the total intended number of children for these women is equal to the number of children they already have.

(2.b) Infecund women:

In TDHSs, infertile women were not asked about their fertility intentions, but these questions may be asked in surveys in other countries (Beaujouan, 2013). As Beaujouan (2013: 44) notes, "*considering that infecund people intend no child assumes that they have renounced having any child, which is not necessarily true (as persons aged 20–39 who know that they cannot have a child are mostly those who have already tried and thus originally wanted to have children). On the other hand, considering that their intentions are the same as the intentions of the others (by ignoring infecund persons in the calculations, for instance,) would not take account of the fact that they have probably corrected their intentions downwards.*". Morgan (1982) recommends the inclusion of infecund women along with the assumption that they intend to have "0" additional children, and Erfani (2017) also includes infecund women, but assumes "unsure" intention for these women. Considering all these approaches, in our analysis, we include infecund women and assume "0" intended number of children for them, and we apply the same approach for sterile women.

(3) Currently pregnant women:

We also made the choice to include pregnant women and considered pregnancies as follows: In calculating the intended number of children, the second component is the actual number of children including current pregnancies. However, when used as an explanatory variable, the actual number of children included number of ever-born children, and not current pregnancies. Therefore, we assumed current pregnancies would directly affect fertility intentions, but not actual fertility since birth has not yet been realized.

Estimation of the Adjusted Total Fertility Rate

As mentioned before, in the calculation of total fertility rate (TFR), a synthetic cohort approach is applied, where information is collected from different cohorts of women. As Adalı (2016) notes, "*TFR is a quantum measure that is subject to tempo distortions. A tempo distortion is defined as an undesirable inflation or deflation of a period quantum or tempo indicator of a life-cycle*

event that results from a rise or fall in the mean age at which the event occurs. (Bongaarts and Feeney, 2008) …. Due to tempo effects, the use of TFR may not be very representative of the real level of fertility women are performing." (Adalı, 2016: 43).

As mentioned before, tempo adjusted TFR, which clears the tempo (i.e., timing) effects, should be used when making comparisons of fertility preference indicators with period fertility measures (Lutz, 2007).

The method used to estimate adjusted total fertility rate in this study is the method of Bongaarts and Feeney (1998) (B-F adjustment). Adalı (2016) applied this method to 1998 and 2003 TDHS data. We follow a similar approach to calculate the tempo adjusted TFR. In adjustment of TFR, adjustment of birth order specific TFRs is needed as mean age of childbearing (MAC) is a weighted average of mean age at childbearing for births of each order (Adalı, 2016; Bongaarts and Feeney, 1998):

$$MAC = MAC_1 w_1 + MAC_2 w_2 + MAC_3 w_3 + MAC_{4+} w_{4+} \text{ where } w_i = \frac{TFR_i}{TFR} \quad \text{(Eqn. 3)}$$

Then annual change in the mean age at childbearing is calculated after defining a period on which the adjustment is required:

$$\frac{x_t - x_{t+a}}{a} = r \quad \text{(Eqn. 4)}$$

where mean age at childbearing is denoted as x, and r is the annual change in the mean age at childbearing.

Then tempo adjusted TFR is calculated as:

$$AdjTFR = \frac{TFR}{1-r} \quad \text{(Eqn. 5)}$$

According to Bongaarts and Feeney (1998):

$$AdjTFR_i = \frac{TFR_i}{(1-r_i)} \quad \text{(Eqn. 6)}$$

where i= 1, 2, 3… as birth orders.

Hence:

$$AdjTFR = \sum AdjTFR_i \qquad \text{(Eqn. 7)}$$

To ensure stability of estimates, as in Adalı (2016), we estimate 5-year TFRs. Time periods for adjustment are selected as in Lesthaeghe and Willems (1999) and Adalı (2016), which use the difference in mean ages at childbearing of two successive periods, use it to adjust the TFR of the latter period. The following periodization scheme is used to calculate adjusted TFR for 1998 TDHS. Similar periodization is applied for each TDHS:

Figure 5. The time periods used for the adjustment of TFR adopted to TDHS-1998

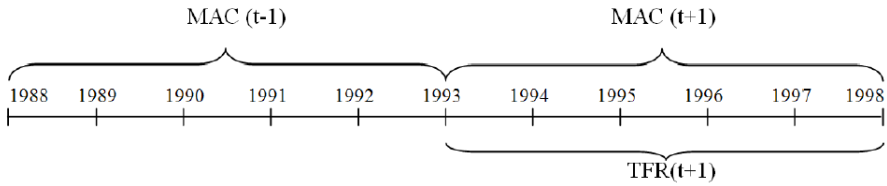


Figure 1. The Time Periods Used for The Adjustment of TFR Adopted to 1998 TDHS
Source: Adalı (2016: 49)

The calculations to derive at adjusted TFR values using all TDHS surveys data are presented in Table 1 and Table 2. These values are used as actual fertility indicators and compared to hypothetical measures of fertility preferences in the Results section.

Table 1. Birth Order Specific B-F Adjustments for TFR, Türkiye 1993-2003

	Birth order	MACi (t+1)	MACi(t-1)	ΔMACi	1-ri*	TFRi(t+1)	AdjTFRi(t+1)	Tempo effect
		(A)	(B)	(C)=(A-B)	(D)=1-(C)/5	(E)	(F)=(E)/(D)	(E)-(F)
1993 TDHS	1	22.50	22.21	0.29	0.94	0.74	0.78	-0.04
	2	25.29	23.88	1.40	0.72	0.65	0.90	-0.25
	3	27.11	25.69	1.42	0.72	0.39	0.55	-0.16
	4	28.53	27.99	0.54	0.89	0.24	0.26	-0.03
	5	30.06	29.62	0.44	-	0.16	0.16	-
	6	31.56	31.70	-0.13	-	0.12	0.12	-
	7	33.58	33.78	-0.20	-	0.10	0.10	-
	8+	36.35	35.90	0.44	-	0.20	0.20	-
	TFR(t+1)					**2.59**	**3.07**	
1998 TDHS	1	22.87	22.42	0.45	0.91	0.82	0.90	-0.08
	2	25.63	24.91	0.71	0.86	0.71	0.82	-0.12
	3	27.66	27.18	0.48	0.90	0.41	0.46	-0.04
	4	29.33	28.22	1.11	0.78	0.23	0.29	-0.07
	5	30.39	30.45	-0.07	-	0.13	0.13	-
	6	32.62	31.69	0.93	-	0.10	0.10	-
	7	33.03	32.55	0.49	-	0.07	0.07	-
	8+	36.83	36.19	0.64	-	0.16	0.16	-
	TFR(t+1)					**2.62**	**2.93**	
2003 TDHS	1	22.99	22.81	0.19	0.96	0.73	0.76	-0.03
	2	25.97	25.54	0.43	0.91	0.63	0.69	-0.06
	3	28.53	27.84	0.69	0.86	0.39	0.45	-0.06
	4	30.12	28.87	1.25	0.75	0.21	0.28	-0.07
	5	30.83	29.89	0.94	-	0.12	0.12	-
	6	31.67	30.94	0.73	-	0.08	0.08	-
	7	32.56	32.24	0.32	-	0.06	0.06	-
	8+	36.44	35.89	0.55	-	0.13	0.13	-
	TFR(t+1)					**2.35**	**2.57**	

* Birth order specific annual change in the mean age at childbearing, r_i, is assumed to be "0" for birth orders of over 4, i.e. TFR_i is not adjusted for birth orders of over 4 since MAC values are not stable for these birth orders.

Table 2. Birth Order Specific B-F Adjustments for TFR, Türkiye 2008-2018

	Birth order	MACi (t+1)	MACi(t-1)	ΔMACi	1-ri*	TFRi(t+1)	AdjTFRi(t+1)	Tempo effect
		(A)	(B)	(C)=(A-B)	(D)=1-(C)/5	(E)	(F)=(E)/(D)	(E)-(F)
2008 TDHS	1	23.87	23.17	0.70	0.86	0.72	0.84	-0.12
	2	26.69	26.15	0.54	0.89	0.62	0.69	-0.07
	3	29.34	28.94	0.40	0.92	0.36	0.39	-0.03
	4	30.62	29.78	0.84	0.83	0.20	0.24	-0.04
	5	31.45	31.01	0.44	-	0.10	0.10	-
	6	32.61	31.32	1.29	-	0.06	0.06	-
	7	33.68	*Est. did not converge*	..	-	0.04	0.04	-
	8+	36.50	36.81	-0.31	-	0.07	0.07	-
	TFR(t+1)					**2.17**	**2.43**	
2013 TDHS	1	24.69	23.91	0.78	0.84	0.78	0.93	-0.14
	2	27.28	26.84	0.44	0.91	0.77	0.84	-0.07
	3	30.42	29.21	1.21	0.76	0.38	0.50	-0.12
	4	31.48	30.22	1.26	0.75	0.16	0.21	-0.05
	5	32.19	32.52	-0.33	-	0.07	0.07	-
	6	33.94	31.94	2.00	-	0.05	0.05	-
	7	34.44	34.12	0.33	-	0.02	0.02	-
	8+	34.12	36.48	-2.36	-	0.04	0.04	-
	TFR(t+1)					**2.28**	**2.67**	
2018 TDHS	1	24.97	24.35	0.62	0.88	0.79	0.90	-0.11
	2	27.76	27.22	0.54	0.89	0.77	0.87	-0.09
	3	30.24	29.62	0.62	0.88	0.50	0.57	-0.07
	4	31.47	30.87	0.60	0.88	0.20	0.22	-0.03
	5	32.77	33.10	-0.33	-	0.08	0.08	-
	6	33.16	34.73	-1.57	-	0.03	0.03	-
	7	35.72	35.07	0.65	-	0.02	0.02	-
	8+	37.52	35.81	1.71	-	0.03	0.03	-
	TFR(t+1)					**2.43**	**2.73**	

* Birth order specific annual change in the mean age at childbearing, r_i, is assumed to be "0" for birth orders of over 4, i.e. TFR_i is not adjusted for birth orders of over 4 since MAC values are not stable for these birth orders.

Multivariate Analyses

In the last part of our study, we analyze fertility intentions by parity using 2018 TDHS data. Our binary dependent variable takes the value of "1" when women answered "yes" to the parity progression intention question of "*Would you like to have (a/another) child, or would you prefer not to have any (more) children?*". For those respondents who answered "no" or were indecisive, sterile or infecund, the dependent variable takes the value of "0". As covariates: age, urban/rural place of residence, region, educational level, household wealth level, employment status, mother tongue, contraceptive use, health insurance, sex composition of children, experience of child death and ideal number of children are used. The analyses were carried out for all parities, and separately for each parity/transition. In our multivariate analyses, we take into account the complex sample design.

RESULTS

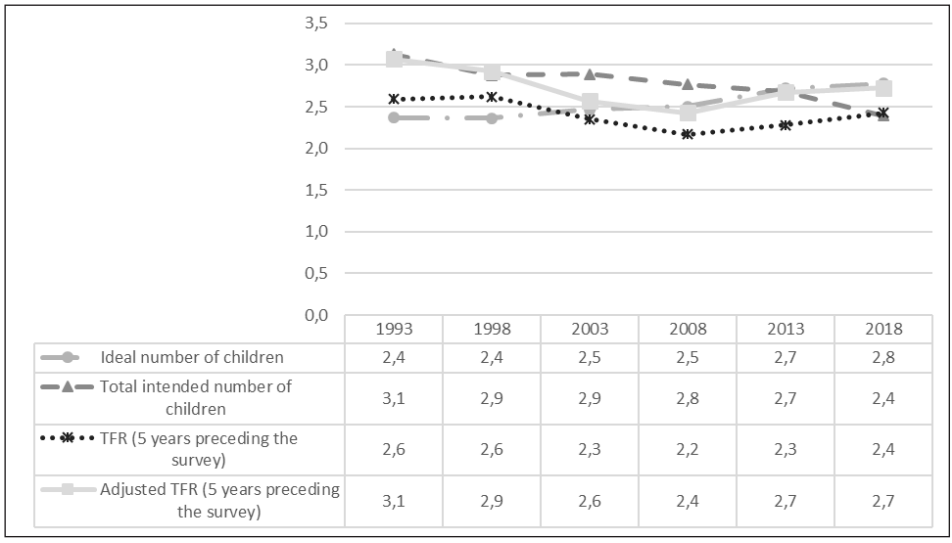
In this section, trends in fertility preference outcome variables are presented first, namely fertility ideals and intentions both in macro (for all women including never married) and micro (for currently married women) perspectives. Comparisons are also made using adequate actual fertility indicators where fertility gap is calculated. Finally, we present our multivariate logistic regression analyses on childbearing intention of women by parities using 2018 TDHS, which provides information on probable near-future outcomes.

1. Trends in Fertility Ideals, Intentions and the Fertility Gap, 1993-2018

1.1. Macro Perspective

Figure 2 presents macro indicators related to (personal) ideal number of children and intended number of children of all women age 15-49 in Türkiye from 1993 to 2018. As previously mentioned, average ideal number of children has been increasing over time, with an increase of 0.4 from 2.4 in 1993 to 2.8 in 2018. Meanwhile, the intended number of children has been declining, going from 3.1 to 2.4 over 25 years. Intended number of children had exceeded ideal number of children until 2013. The two-child norm has become a three-child norm, whereas intended number of children has declined from the level of 3.1 to 2.4. Actual fertility indicators also showed a declining trend, where TFR dropped and stabilized at a level above replacement level, at 2.4. Tempo

adjusted fertility rate, which removes the effect of fertility postponement related to temporary period effects, has also been declining albeit showing a slightly increasing trend recently. As expected, adjusted TFR is always above the conventional TFR. The difference between tempo adjusted and unadjusted TFR was also in decline until 2013, indicating that timing effects on fertility have been declining.



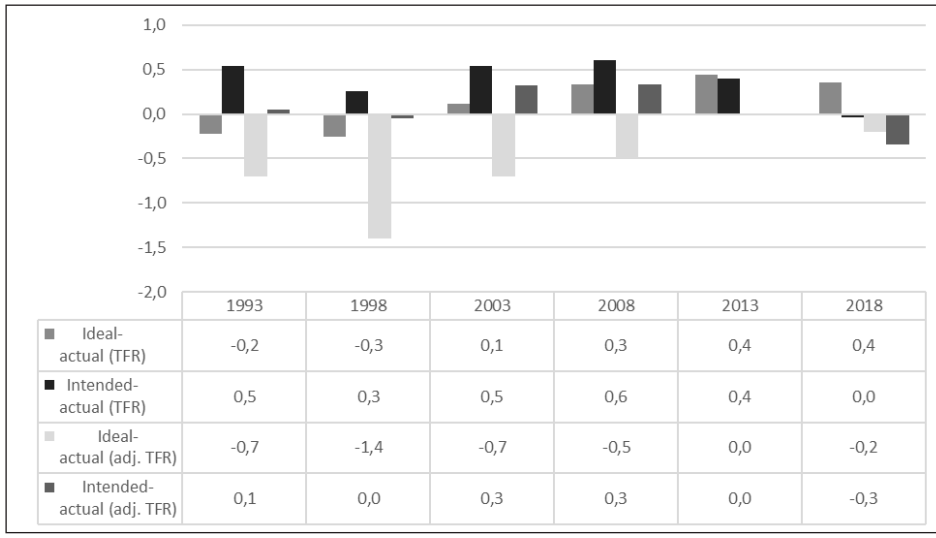
	1993	1998	2003	2008	2013	2018
Ideal number of children	2,4	2,4	2,5	2,5	2,7	2,8
Total intended number of children	3,1	2,9	2,9	2,8	2,7	2,4
TFR (5 years preceding the survey)	2,6	2,6	2,3	2,2	2,3	2,4
Adjusted TFR (5 years preceding the survey)	3,1	2,9	2,6	2,4	2,7	2,7

Figure 2. Average Ideal, Intended and Actual Number of Children of Women Age 15-49, Türkiye 1993-2018

Note: Non-numeric responses were excluded in the calculation of ideal and intended number of children.

Figure 3, which can be derived from Figure 2, presents the fertility gap between 1993 and 2018. As stated earlier, a comparison between hypothetical fertility and actual TFR can be misleading since ideal or intended fertility has both a cohort and a period dimension, whereas TFR is a distorted period measure. Although the fertility gap is positive or "0" when intended fertility and TFR are compared; the gap becomes negative when adjusted TFR is used as a measure of actual fertility. A positive fertility gap can be interpreted as an unmet need for children, whereas a negative gap may indicate an unmet need for family planning. Although the gap in absolute terms was declining until 2018, when a comparison is made with the adjusted TFR, the gap increased in

magnitude in 2018. This is in line with the increase in unmet need for family planning seen in the 2018 TDHS. In summary, when we look at the fertility gap, although conventional measure is positive or "0", a comparison between adjusted TFR indicates a negative gap by 2018, i.e., excess actual fertility compared to ideal or intended number of children.



	1993	1998	2003	2008	2013	2018
Ideal-actual (TFR)	-0,2	-0,3	0,1	0,3	0,4	0,4
Intended-actual (TFR)	0,5	0,3	0,5	0,6	0,4	0,0
Ideal-actual (adj. TFR)	-0,7	-1,4	-0,7	-0,5	0,0	-0,2
Intended-actual (adj. TFR)	0,1	0,0	0,3	0,3	0,0	-0,3

Figure 3. Fertility Gap of Women Age 15-49, Türkiye 1993-2018

Note: Non-numeric responses were excluded in the calculation of ideal and intended number of children.

1.2. Micro Perspective

Table 3 presents the trends in the mean values of ideal and intended number of children and fertility gap for each survey year covering only currently married women. Mean ideal number of children increased from 2.4 to 3.0 between 1993 and 2018. That said, mean intended number of children has declined from 3.5 to 2.9 for currently married women. Both the difference between ideal fertility and actual fertility (i.e. number of children ever born) and intended fertility and actual fertility have increased in time. However, the upper part of Table 3 includes women of all reproductive ages and covering women who have not completed their reproductive period when measuring family size with children ever born can be misleading. Hence the lower part of the Table covers women of ages 40-49. Differently from the macro perspective,

mean difference between hypothetical and actual fertility is positive in the year of 2018 for currently married women. The difference is much smaller for intended fertility compared to ideal fertility.

Table 3. Average Ideal, Intended and Actual Number of Children and Fertility Gap of Currently Married Women Age 15-49, Türkiye 1993-2018

	1993	1998	2003	2008	2013	2018
Women of age 15-49						
Mean ideal number of children	2.39	2.47	2.53	2.54	2.86	2.97
Mean intended number of children	3.47	3.22	3.12	2.94	2.91	2.89
Mean number of children ever born (CEB)	3.03	2.76	2.64	2.49	2.32	2.37
Mean (ideal-CEB)	-0.61	-0.24	-0.11	0.07	0.55	0.60
Mean (intended-CEB)	0.43	0.46	0.41	0.46	0.59	0.52
Women of age 40-49						
Mean ideal number of children	2.53	2.64	2.62	2.68	2.99	3.15
Mean intended number of children	4.77	4.39	3.72	3.46	3.13	2.98
Mean number of children ever born (CEB)	4.74	4.33	3.66	3.40	3.04	2.88
Mean (ideal-CEB)	-2.17	-1.62	-1.01	-0.69	-0.03	0.28
Mean (intended-CEB)	0.03	0.06	0.03	0.05	0.09	0.10

Note: Non-numeric responses were excluded in the calculation of ideal and intended number of children.

Table 4 shows the distribution of fertility desires and fertility intentions of women at different actual parities based on the 2018 TDHS. The diagonal cells in Table 4 present the percentages where ideal number of children exactly matches actual number of children. Among those at parity 0, only 1.4% reported that their ideal number of children was "0", while 42% reported their ideal fertility was "2". Almost all of these women (99%) had not yet realized their ideal fertility, and 86% stated that they intended to have children in the future. For women with parity "1", 90% had not reached their ideal fertility, whereas this share declines as actual parity increases. 60% of women with parity of "1" intend to have another child in the future. Among women with parity "2", 42% realized their two-child ideals and 17% of these women intend to progress to the third child in the future.

However, as noted previously, ideal number of children is a hypothetical level of completed fertility that reflects the level of pronatalism. Hence, this difference between ideal and current number of children should not be used as policy justification. The gap is large in most settings.

It is more probable that fertility intentions, especially short-term intentions, are realized. As expected, fertility intention has an inverse relationship with child parity, as shown in the bottom two rows of Table 4. In other words, as the number of children increases, the share of women who intend to have another child declines.

These results emphasize the need for a parity-specific analysis.

Table 4. Ideal Number of Children and Childbearing Intention Among Currently Married Women at Different Parities, Türkiye, 2018

Ideal parity	Actual parity					
	0	1	2	3	4	5+
0	1.4	1.8	1.4	1.6	1.3	4.8
1	8.8	8.1	3.4	3.2	2.1	1.2
2	41.9	49.3	41.5	18.7	21.3	17.2
3	25.2	27.5	30.0	38.1	11.8	16.9
4	15.3	10.5	20.7	28.8	50.3	27.8
5+	7.5	2.9	3.0	9.6	13.3	32.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Ideal ≤ Actual	1.4	9.9	46.2	61.6	86.7	100.0
Ideal > Actual	98.6	90.1	53.8	38.4	13.3	0.0
Intend to have a child	86.0	60.0	17.3	9.7	4.8	0.0
Not intend	12.6	30.1	36.4	28.6	8.5	0.0

2. Multivariate Parity-Specific Analyses on Parity Progression Intention of Women, 2018

Characteristics of women in our analytical sample, i.e. percent distribution of currently married women by the dependent variable and covariates used in the multivariate analyses, are presented in Table 5. When we look at the dependent variable, it is seen that 72% of women intend to have another child in the future. Women who do not intend to have birth or are undecided about intention or sterile or infecund women, on the other hand, constitute 28%

of the sample. Among explanatory variables, distribution by ideal number of children indicates that proportion of women who desire to have two children in ideal conditions is 34%, while 59% of women desire to have 3 or more children. In the previous section on the micro perspective, it was calculated that ideal number of children has reached 2.97 for currently married women by the year of 2018, i.e. ideally, 2-child norm has evolved to 3-child norm among currently married women. The findings in Table 5 also reveal this development in a different way.

The most important covariates used are parity (number of children ever born) and age of women. 34% of women have two children, while 7% of women are childless, put differently 7% of women never had live birth. Age distribution of currently married women indicates that the share of women in adolescence is low as expected.

Other covariates are type of place of residence, region, completed level of education, household wealth level, employment status by coverage, mother tongue, contraceptive use at the time of the survey, health insurance, sex composition of children and experience of child death of woman.

Table 5. Percent Distribution of Currently Married Women by Variables, Türkiye 2018

	Percentage (%)	Unweighted number
Intention to have a(nother) child		
Yes	71.8	3,713
No*	28.2	1,443
Ideal number of children		
0	1.7	82
1	4.3	229
2	34.2	1,726
3	28.2	1,462
4+	31.1	1,627
Missing	0.6	30
Total children ever born		
0	7.1	358
1	19.3	931
2	35.2	1,735
3	21.9	1,162
4+	16.7	970
Age group		

15-19	1.2	69
20-24	8.5	437
25-29	15.3	801
30-34	19.2	1,010
35-39	20.8	1,057
40-44	18.9	941
45-49	16.2	841
Type of place of residence		
Urban	77.7	3,661
Rural	22.3	1,495
Region		
West	43.5	1,540
South	12.8	649
Central	21.3	1,050
North	5.3	638
East	17.1	1,279
Education completed		
No educ./prim. incomp.	12.1	730
Primary	39.9	2,061
Secondary	16.9	889
High school or higher	31.2	1,476
Household wealth level		
Low	34.7	2,140
Middle	42.8	2,040
High	22.6	976
Employment		
Non-emp./never emp.	71.4	3,701
Employed with soc. sec.	16.5	768
Employed without soc. sec.	12.1	687
Mother tongue		
Turkish	78.3	3,925
Kurdish	15.9	957
Other	5.7	274
Contraceptive use		
No method	30.2	1,566
Traditional	21.0	1,130
Modern	48.9	2,460
Health insurance		
No	9.4	532
Yes	90.5	4,621
Missing	0.1	3

Sex of child		
Only boy	22.7	1,155
Only girl	19.0	920
Both sex	51.2	2,723
Does not have children	7.1	358
Ever experienced child death		
Not experienced	86.4	4,427
Yes experienced	6.5	371
Does not have children	7.1	358
Total	100.0	5,156

*Indecisive and sterile or infecund women are in this category.

As mentioned before, parity is a very crucial variable in fertility intention (Chen and Yip, 2017). Therefore, our multivariate models are designed both for all parities (Model 1) and for each parity separately (Model 2, 3, 4, and 5) (for a similar application see Chen and Yip, 2017). In parity-specific analyses, the dependent variable is the intention for parity progression of a specific order. For instance, analyses for women with one child investigate intention to progress from first to second birth.

In Table 6, binary logistic regression results as odds ratios and significance levels are presented. Differently from others, in the first model, number of children ever born is included among explanatory variables. According to Model 1 results, where all currently married women with no child and with all parities are covered, women of age 30+ are less likely to have another birth compared to women of age 25-29. The intention to have a child, which decreases linearly with age, also decreases with parity. Childless women are 6.2 times more likely to intend to have birth compared to women with one child. Again, these women are 96% less likely to have birth intention compared to women with 3 children. While there is no difference in fertility intention among women in urban versus rural settlements, region leads to significant differences. Women living in the East and South have higher tendency for fertility intention compares to women living in the West. Socioeconomic variables (educational level, household wealth level and employment status) do not provide significant odds ratios. When we look at mother tongue, Kurdish women are 1.3 times more likely to have birth intentions compared to Turkish women. Not using any contraceptives is positively associated with birth intention. Current

use of contraception variable is significant, where non-user women are 1.6 times more likely to have birth intention compared to women using modern methods. While health insurance is not a significant factor associated with birth intentions, children-related and fertility preference variables such as sex composition of existing children, child death experience and ideal number of children are significantly associated. Having only male or only female child(ren) and having had experienced child death are positively related to have an intention for another birth. As expected, ideal number of children is also associated with birth intention. Women who have pronatalist norms are more likely to intend to have another birth in the future.

When we look at childless women (Model 2), in addition to significant variables in Model 1, household wealth level, employment status and health insurance also have significant explanatory power. Birth intention peaks among married women of age 15-19 and odds ratio of the age group of 30-34 is higher than that of 25-29. Above age 40, the tendency declines considerably. Childless women living in rural areas are 2.8 times more likely to have birth intention than those living in urban areas. Although the urban/rural variable does not have a significant odds ratio, the region variable indicates some spatial differences. Childless women living in the Eastern region are 7.1 times more likely to have birth intention compared to women living in the Western region. For childless women, the higher the welfare level, the higher the intention to have children. Nonemployed women are 5.2 times more likely to have childbearing intention than women employed with social security coverage. When looking at the mother tongue, there is no significant difference between Turkish and Kurdish women, while women with other mother tongues such as Arabic are 4.3 times more likely to plan to have children compared to Turkish women. Married women with health insurance are 6.1 times more likely to have birth intention than those who do not. Ideal number of children is associated with intention to have birth, albeit not linearly. Women whose ideal number of children is over 2 have higher tendency to have birth intention. Women whose ideal number of children is one, on the other hand, have a lower intention to have birth than women with ideal number of children of 2.

When intention to have a second child among married women with one child are analyzed, different variables are found to be significant but with the

expected way of association (Model 3). For example, as age increases, the tendency to have second birth intention decreases. While spatial variables have insignificant explanatory power, education and household wealth level are found to be associated with the intention to have children in the expected way. Secondary school graduate women are 1.8 times more likely to have intention to advance their parity level than women with high school or higher education. Having intention to have a second child is more likely among women with low or middle household wealth level than women with high wealth level. Employment status, on the other hand, does not appear to be a significant socioeconomic variable in explaining the intention to have a second child. Women who do not use contraception and have health insurance are more likely to have the intention of having a second child. Ideal number of children also significantly affects the transition to the second child; as the ideal number of children increases, the tendency to progress to the second child increases.

Less number of variables were found to be significant in the two-to-third-child transition intention model (Model 4). As in the previous models, the tendency to have a child decreases as age increases and the intention to have a third child is more common in the East region than in the West. Not using contraception and the ideal number of children are positively associated with the intention to progress to the third birth. It is an interesting finding that women with an ideal number of children of "0" are 8 times more likely to intend to have a third child than women with an ideal number of children of "2". The categories of education, household wealth level, employment status, mother tongue, health insurance, sex composition of children and child death experience do not have significant odds ratios.

Considering our final model, the third-to-fourth birth progression intention (Model 5), the variables found to be significant are age, region, child death experience, and ideal number of children. As in the previous models, the tendency to have an intention to progress to a fourth child decreases as age increases. Women living in the Eastern or Northern regions are more likely to have an intention to have a fourth child than women living in the West region. Women who had experienced child death are 5.6 times more likely to have a fourth child than those who had not. Women with an ideal number of

children of 4 or more are 13.4 times more likely to intend to have a fourth child than women with an ideal number of children of "2".

Table 6. Odds Ratios of Logistic Regressions: Childbearing Intention of Women at Different Parity Levels, Türkiye 2018

	Model (1) Childbearing intention For all parities	Model (2) Childbearing intention (parity 0à1)	Model (3) Childbearing intention (parity 1à2)	Model (4) Childbearing intention (parity 2à3)	Model (5) Childbearing intention (parity 3à4)
Age group					
15-19	1.205	2.583	3.953	0.117	..
20-24	1.223	0.922	0.849	1.632	6.166***
25-29 (ref.)	1.000	1.000	1.000	1.000	1.000
30-34	0.640***	1.878	0.613	0.621**	0.994
35-39	0.284***	0.330	0.240***	0.269***	0.322***
40-44	0.100***	0.073***	0.106***	0.078***	0.064***
45-49	0.023***	0.101***	0.018***	0.025***	0.020***
Total children ever born					
0	6.221***				
1 (ref.)	1.000				
2	0.114***				
3	0.044***				
4+	0.013***				
Type of place of residence					
Urban (ref.)	1.000	1.000	1.000	1.000	1.000
Rural	1.007	2.837	0.871	0.887	1.231
Region					
West (ref.)	1.000	1.000	1.000	1.000	1.000
South	1.335*	3.238	1.208	1.378	1.163
Central	0.995	2.949	0.879	1.168	0.808
North	1.203	0.612	1.400	0.954	2.120*
East	2.069***	7.083**	1.463	2.188***	2.530**
Education completed					
No educ./ prim. incomp.	1.019	1.063	1.457	0.636	1.442
Primary	0.902	0.371	1.132	0.724	1.263
Secondary	1.128	1.251	1.774*	0.887	1.131
High school or higher (ref.)	1.000	1.000	1.000	1.000	1.000

Household wealth level					
Low	1.254	0.093**	1.388	1.275	2.463
Middle	1.185	0.691	1.478*	0.894	2.165
High (ref.)	1.000	1.000	1.000	1.000	1.000
Employment					
Non-emp./ never emp.	1.006	5.223**	0.834	1.118	2.165
Employed with soc. sec. (ref.)	1.000	1.000	1.000	1.000	1.000
Employed without soc. sec.	0.795	1.202	0.770	0.886	1.793
Mother tongue					
Turkish (ref.)	1.000	1.000	1.000	1.000	1.000
Kurdish	1.309*	0.970	1.224	1.404	0.975
Other	1.176	4.262*	1.313	0.997	0.822
Contraceptive use					
No method	1.594***	0.538	1.629*	1.842***	1.509
Traditional	1.091	0.651	1.074	1.291	0.605
Modern (ref.)	1.000	1.000	1.000	1.000	1.000
Health insurance					
No (ref.)	1.000	1.000	1.000	1.000	1.000
Yes	1.145	6.131**	2.224**	0.781	1.141
Sex of child					
Only boy	1.339*		1.182	1.162	0.760
Only girl (ref. in Model 3)	1.359*		1.000	1.227	1.708
Both sex (ref.)	1.000			1.000	1.000
Ever experienced child death					
Not experienced (ref.)	1.000		1.000	1.000	1.000
Yes experienced	2.646***		1.000	4.530	5.646***
Ideal number of children					
0	0.284	1.000	0.065***	7.927***	4.458

1	0.214***	0.246*	0.042***	0.703	1.653
2 (ref.)	1.000	1.000	1.000	1.000	1.000
3	2.920***	2.551	1.684**	13.564***	1.001
4+	6.738***	1.656	1.725	17.035***	13.404***
Constant	1.305	6.297	4.070	0.009***	0.044***
Number of obs.	5,156	354	926	1,735	1,158
F-test	23.327	3.344	6.507	9.812	7.319
Prob > F	0.000	0.000	0.000	0.000	0.000

*** p<0.01, ** p<0.05, * p<0.1

DISCUSSION AND CONCLUSION

This study analyzed the trends in fertility preferences in Türkiye, namely, changes in fertility ideals and fertility intentions using data from six TDHS between 1993 and 2018. Fertility gap was also analyzed, taking into account different actual fertility indicators at the macro level, as well as at the micro level. Finally, determinants of birth intention by parity were analyzed employing multivariate logistic regression method for the most recent data from the 2018 TDHS.

Our findings indicate that the ideal number of children has been increasing over the 25-year period of 1993-2018, whereas the intended number of children has been declining on average. We have discussed how fertility gap, which is measured as the difference between ideal or intended fertility and actual fertility, can be misleading when actual fertility is taken as total fertility rate. However, if actual fertility is measured with tempo adjusted total fertility rate, the results are more valid to derive at inferences. Although the ideal versus actual fertility gap increased according to the conventional TFR indicator, it declined in absolute terms when adjusted TFR is used. Moreover, the gap has been mostly negative, indicating that actual fertility exceeded ideal fertility (when a comparison is made with adjusted TFR). Intended fertility is more likely to be realized as behaviors compared to ideals as suggested in both theoretical and empirical studies. Hence, the intended-actual gap could be a better indicator. Intended-actual gap has been smaller when adjusted TFR is used, and has been negative by 2018 indicating that adjusted TFR exceeded

intended number of children for 2018. This indicates that there is no excess demand for children compared to actual fertility, but rather pronatalism has been increasing in Türkiye in terms of "personal ideals" only.

Compared to the studies on fertility gap in Europe (for example Sobotka and Lutz, 2010; Philipov and Bernardi, 2012; Beaujouan and Berghammer, 2019), which find positive fertility gap in almost all findings independent of the period or cohort perspective used, we find a negative gap for Türkiye. This is an expected finding as fertility levels in Europe is much lower compared to Türkiye.

Changes in mean ideal and intended number of children at the micro level in Türkiye are also noteworthy. Mean ideal number of children has been increasing while mean intended number of children has been declining. This indicates a discrepancy between ideals and expectations among women. Considering that expectations are more likely to be realized, a declining trend in actual fertility rates has also been explained by this change in fertility intentions. At the micro level, hypothetical-actual comparison provided further information and highlighted the necessity of parity-specific analyses.

Looking at the overall models of birth intentions, it is seen that the age of the woman, the number of children (in Model 1) and the ideal number of children are the most important explanatory variables. Looking at the spatial variables, it is seen that region rather than urban/rural settlement variable is significant in the models. Especially women living in the Eastern region are more likely to plan to have another child. Socioeconomic variables such as educational level, employment status and household wealth level are not significantly explanatory in most models. Some of these variables were found to be significant only in progression to first-child and second-child models. Our finding of negative but insignificant association of employment with birth intentions is in line with that of Chen and Yip (2017) on Hong Kong. Health insurance ownership also emerges as a significant variable in these models. Not using any contraceptive method is positively associated with birth intentions in most models. Sex composition of children and experiencing child death are both significant only in Model 1, while child death is significant in progression to fourth birth model.

Our study has policy implications:

- Before making any inferences from analyses on fertility preferences, the measures and definitions used should be clearly investigated. There has been an increase in the level of pronatalism in Türkiye, however it would be wrong to conclude that this is reflected in intentions and behaviors.
- Based on the literature, one of the appropriate fertility gap measures to derive at policy inferences is intended fertility minus adjusted TFR. Based on this measure, the gap is negative in Türkiye suggesting excess fertility over ideal and intended fertility. Put differently, alternative measures of fertility gap suggest that actual fertility indeed exceeds desired and intended fertility at the macro level in the country.
- To influence birth intentions via socioeconomic variables seems not to be realistic since intentions are significantly associated with biodemographic variables related to women and their children such as age, parity, experience of child death, and etc. rather than human capital variables.

As regards to future works, the changes in fertility ideals in Türkiye are an interesting issue to analyze further, but how women in the "undecided" category will be treated in future analyses is a critical question. Methodological approaches to handling undecided women should be considered and studied in more detail. Another future study would be analysis of the fertility gap in Türkiye following a cohort approach using TDHS series. Such a study would contribute methodologically to the former part of this study at hand.

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