Influence of migration on fertility behavior of Turkish migrants in Germany

Bachelor thesis by
Name: Tobias Meppelink
Institution: University of Groningen
                 Faculty of Spatial Sciences
Study: Human Geography & Planning
Supervisor: Adrien Remund
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Abstract

In many aspects, migration is an influential event in someone's life course. Fertility behavior is one of the behaviors for which this effect was found. This study aims at examining the influence of migration on the fertility behavior of Turkish migrants in Germany. After reviewing the literature on fertility determinants in developed societies and on the influence of migration on fertility behavior, two hypotheses are considered for this thesis: the adaptation hypotheses and the disruption hypothesis.

Data from Generations and Gender Survey is used to estimate two Poisson regression models with fertility as the dependent variable. The first one is used to calculate predicted means of childbearing for Turkish migrants and German natives; the second to examine the development of Turkish migrant fertility with an increasing duration of stay and including controls for compositional differences between migrant cohorts.

The results show to be consistent with both the hypothesis of disruption and adaptation, and a coherent trend is visible in the development of fertility behavior over duration of stay. However, no significant results are found for differences in fertility across all migrant cohorts, which seems to due to the relatively small sample size of this analysis. Another remarkable result is the considerable differences in predicted means between childbearing of all migrant cohorts and German natives, suggesting that migrant fertility does not completely adapt to that of natives. Overall, the results indicate that both disruption and adaptation mechanisms are indeed of influence on the fertility behavior of Turkish migrants in Germany.

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1. Introduction

As EU-countries' life expectancy has been increasing in the last decennia, and birth rates have fallen below replacement level, many of these countries experience rising dependency ratios, increasing demographic pressure and even sometimes population decline (Adserà & Ferrer, 2014; Eurostat, 2019a; Eurostat, 2019b). Migration is able to help alleviate these issues, as migrants are generally young and thus can decelerate population ageing and decline (Devolder & Bueno, 2011; United Nations, 2001). Moreover, the influence of migration extends beyond migrants alone: the destination's population composition is also influenced by the fertility behavior of migrants (Wilson, 2015). Therefore, studying migrant fertility is key to a comprehensive understanding of the influence of migration on a country's population dynamics.

Additionally, studying migrant fertility serves a purpose other than measuring shifts in population composition; it sheds light on the influence of migration on a migrant's fertility. Migration is generally an important life event and can influence one's life course considerably, consequently affecting all sorts of behavior –including childbearing– in many ways (Kulu & Gonzalez-Ferrer, 2014). Previous research has focused on the dynamic between migration and fertility and the extent to which fertility can change due to migration. Several theories exist to define this effect (See section 2.1) and are concerned with either the influence of migration itself or that of the migrant's new destination.

In the Western European context, Turkish immigrants are currently the largest non-EU immigrant group and one of the biggest non-EU migrant groups in Germany –the most populated Western European country– accounting for 3.6% of the total German Population (Krapf & Wolf, 2015; Sirkeci, 2002). In 1960, Turkish men were recruited for low-skilled jobs in the German industrial sector, prompting a new flow of Turkish-German migration (Yazgan et al., 2012). Five years later, Turkish women were allowed to migrate to reunify with their husbands, which led to a surge of female Turkish-German migration (Sirkeci, 2002). Despite the first cohorts of Turkish migrants having lived in Germany for more than 50 years, their fertility behavior has been understudied which is odd considering the size of this group. This thesis will study the fertility behavior of first generation Turkish immigrants in Germany and analyze its development over the duration of the stay, eventually identifying how migration and the new destination influence their fertility.

To study this relationship, the research question is proposed:
- ❖ *To which extent does Turkish migrant fertility behavior change after migration to Germany?*

This research question will be answered with the help of several sub questions:
- *What is the cumulative fertility of natives and of Turkish immigrants in Germany?*
- *Can disruption of fertility be found short after arrival?*
- *Does convergence of migrant fertility to native fertility occur over time?*

The outline of this thesis is as follows: Section 2 summarizes the existing literature on migrant fertility and fertility determinants. Section 3 presents the methodology of the analysis, the datasets, and its limitations. Section 4 presents and discusses the results of the analysis. Finally, section 5 draws the main conclusions and suggests possible future alleys of research.

2. Theoretical Framework
2.1. Hypotheses on migrant fertility
In 1981, Goldstein and Goldstein published a paper on the impact of migration on fertility and introduced three fundamental mechanisms that explain fertility behavior of migrants, namely *selection, disruption* and *adaptation*. This sparked widespread discussion about the influence of migration on fertility, resulting in five different hypotheses that are commonly discussed and tested by scholars (Bledsoe, 2004; Devolder & Bueno, 2011; Kulu, 2005).

First, the *selection* hypothesis suggests that migrants have specific preferences and characteristics that set them apart from the population at origin. Migration is regarded as nothing more than a selective process in which these migrants are moving to an environment where fertility norms and behavior are similar to those of the migrant (Milewski, 2007; Waller, 2012). Therefore, the selection hypothesis anticipates little differences in fertility behavior between migrants and non-migrants at destination. Second, the *disruption* hypothesis assumes that the process of migration is stressful and can temporary separate couples, thereby disrupting fertility for a short period after migration (Milewski, 2007; Impicciatore et al, 2020). Thereafter, it is observed to increase again to catch up on childbearing (Kulu 2005; Impicciatore et al, 2020). Third, the *adaptation* hypothesis considers the fertility behavior and socio-economic environment of the host community of key influence (Kulu & Gonzalez-Ferrer, 2014). It predicts that –over time– fertility behavior of migrants converges with that of natives, as migrants are exposed to the norms, values, attitudes and behavior of the host population (Devolder & Bueno, 2011; Kulu, 2005). Fourth, the *socialization* hypothesis suggests that migrants follow the fertility norms, values and behavior prevalent in their childhood environment, even if these differ from those at destination (Kulu, 2005; Lübke, 2015; Milewski, 2007). Lastly, the *interrelation of events* hypothesis suggests that migration goes hand-in-hand with other life course events –such as union formation, marriage and childbirth– which implies increased fertility shortly after migration (Milewski, 2007).

Despite these hypotheses appearing as mutually exclusive, these hypotheses can follow-up and complement each other (Devolder & Bueno, 2011). Additionally, the extent to which these hypotheses are proven valid is dependent on context-specific factors: the migrant's origin and destination, and the migration strategy (the goals and reasons for migration) (Adserà & Ferrer, 2015; Impicciatore et al., 2020). Hence, it is difficult to isolate the hypotheses for testing and therefore even more difficult to conclusively and absolutely accept/reject any hypothesis.

2.2. Determinants of fertility
When studying the influence of migration on fertility, it is crucial to take into account all other factors determining fertility behavior. In their pioneering work, Bongaarts & Watkins (1996) emphasized that one's fertility behavior is not only influenced by individual characteristics, but also by interactions with their social networks and environment, as childbearing patterns and preferences can spread through social interaction between friends, peers, and colleagues. Based on this work, Balbo et al. (2013a) developed a comprehensive framework of fertility determinants in developed societies. In their review, they present these determinants and position them in three levels of scale.

At the micro-level, a few individual characteristics influence fertility. Even though biological and genetic characteristics do undoubtedly affect fertility, social factors are deemed most important in developed societies (Baykara-Krumme & Milewski, 2017). Therefore, this subsection focusses on social factors; the most important factor being fertility intentions. These are the values, attitudes and expectations an individual holds towards childbearing (Balbo et al., 2013a). Fertility intentions are responsible for the eventual childbearing decisions that are made and ultimately shape fertility behavior (Spéder & Kapitány, 2015). Based on personal, demographic, economic, and societal factors, they operate as the link between these factors and fertility behavior (Ajzen & Klobas, 2013). However, as will be discussed later on in this section, fertility intentions are also influenced by factors other than at the individual level. In addition, both education and income are widely regarded to have a considerable impact on fertility behavior. It is still however ambiguous in which ways these determinants influence fertility

behavior exactly (Lakomý, 2014; Lutz, 2010; Martin; 1995). Regardless of these complex relationships, there is overwhelming evidence that both a higher level of education and higher income are generally strongly associated with lower fertility (Götmark & Andersson, 2020; James et al., 2012; Jones et al., 2008). Partnership status also is a crucial determinant, since having a partner increases the risk of birth significantly when compared with not having one (Bijlsma, 2017). Lastly, age is undoubtedly an essential determinant of fertility, as (cumulative) fertility logically increases with age.

Regarding meso-level, the influence of social relationships on fertility behavior should not be underestimated. Keim et al. (2013) argue that social influence –the process by which attitudes, values and/or behavior of an individual will be shaped and altered by that of others (Bernardi, 2003)– is fairly influential on fertility behavior. Through social influence, social relationships are able to affect one's fertility intentions and behavior (Bernardi & Klärner, 2014). Support for this diffusion is found for various social relationships, for example between friends (Balbo et al. 2013b; Balbo & Barban, 2014), co-workers (Hensvik & Nilsson, 2010; Pink et al., 2014), siblings (Lyngstad & Prskawetz, 2010), and between parents and their children (Booth & Kee, 2009; Kotte & Ludwig, 2011).

Concerning the macro-level, important determinants are the economic, institutional and cultural setting in which individuals shape their fertility decisions. A country's social policies and economic situation (indirectly) make having children more (or less) attractive, affecting fertility intentions and behavior (Ajzen & Klobas, 2013; Balbo et al., 2013a). Cultural context and societal norms and values also affect fertility behavior. For example, socially accepted age deadlines of childbearing differ between European countries (Billari et al., 2011). Liefbroer & Billari (2010) urge not to underestimate the influence of such fertility norms in developed societies and argue their contemporary relevance. Moreover, Balbo et al. (2013a) discuss that the usage of contraceptives is a distinct macro-level determinant since it has a considerable influence on fertility behavior (Bongaarts, 1978). While this is true, availability and endorsement of contraceptive technologies still hinge on policies and social, societal and cultural values, norms and attitudes (Frejka, 2008).

2.3. Influence of migration on fertility determinants

Now it is clear what factors contribute to one's fertility behavior, it is possible to discuss how migration affects these determinants. In the short term, the process of migration itself affects fertility determinants (Lübke, 2015). Psychological stress and economic costs of migration together with possible short-term separation of partners during the move may result in decreased fertility intentions, thereby delaying childbearing during and shortly after migration (Hervitz, 1985; Stephen & Bean, 1992). Moreover, migrants' needs change due to migration, which leads to them altering their social networks to meet these (new) needs accordingly (Lubbers et al., 2010). This reconstruction disrupts existing networks, thereby interrupting and influences by these networks (Impicciatore et al., 2020; Lubbers et al., 2010). Once these effects have worn off, subsequent catching-up behavior is expected to compensate for this period of low-fertility (Milewski, 2007). Thus, it is expected that disruption will occur for fertility behavior in the short term. Although this hypothesis has been frequently studied, consistent results for the disruption hypothesis have not been found. Where various papers find support for disruption (Devolder & Bueno, 2011; Gonzalez-Ferrer et al., 2017; Impicciatore et al., 2020; Stephen & Bean, 1992), other do not (Baykara-Krumme & Milewski, 2017; Milewski, 2007).

In the long term, migrant fertility behavior is affected by other changes in fertility determinants. Over time, the composition of their social networks is expected to change greatly, as migrants acquire social ties in the destination country while losing ties in the country of origin (Lubbers et al., 2010; Ryan & D'Angelo, 2017). Consequently, their fertility behavior will gradually be more influenced by natives and less by stayers. Furthermore, migrants find themselves in a new institutional/economic setting and cultural context. Due to these shifts in the composition of macro-determinants, the influence of the new environment increases gradually over time. As a result, it is expected that migrants adapt their fertility behavior to that of natives (Krapf & Wolf, 2016). Studies on migrant fertility in the long term show to be

consistent with this hypothesis. Devolder & Bueno (2011) find fertility of several migrants groups in Spain shows signs of adaptation towards native fertility. Adserà & Ferrer (2013) discover a similar pattern among child migrants; a category of migrants which is not biased by selection (Adserà & Ferrer, 2014). Tønnesen & Mussino (2019) study migrant groups moving from low- to high-fertility countries –a situation which has not received as much attention as 'high-to-low-fertility migration'– and find patterns of adaptation.

Considering the aforementioned changes in fertility determinants, it is expected that -short after migration- a period of low-fertility due to disruptive effects ensues, followed by a brief moment of high-fertility. In the long term, the influence of networks and environment at origin decreases, while that of new networks and novel environment at destination increases. Over time, migrant fertility intentions and behavior consequently come to resemble native fertility, eventually leading to a convergence of migrant fertility behavior to that of natives.

2.4. Hypotheses & conceptual model

In this thesis it is hypothesized that in the short period of time after migration, disruptive effects of migration itself cause low levels of fertility shortly after the move, followed by an increase of fertility as a result of catching-up behavior. Thereafter, due to the increasing influence of determinants in the country of destination (and decreasing influence of determinants at origin) migrants' fertility intentions and behavior adapts and converges to that of the natives. This process is visualized in Figure 1.
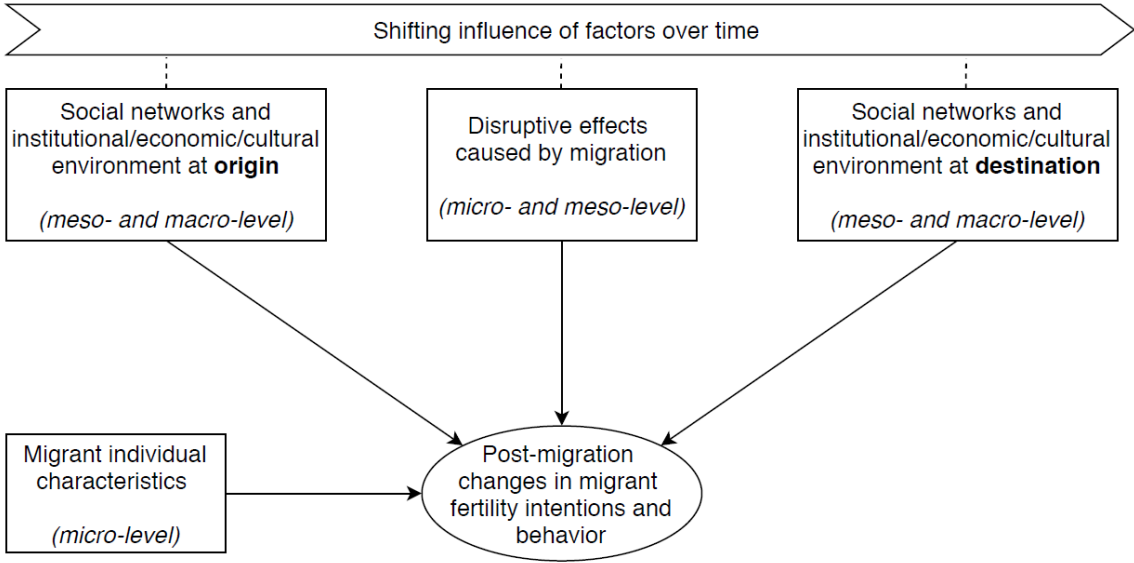

Figure 1: Conceptual model

3. Methodology
3.1. Data collection & data quality

To analyze the influence of migration on fertility, data from the Generations & Gender Survey (GGS) is used. The GGS is a component of the greater Generations & Gender Programme (GGP), which aims to support scientists and policymakers in understanding contemporary societal changes. It collects comprehensive cross-sectional and longitudinal micro-level data on life and family dynamics in European countries to gain a better understanding of parent-child relationships and relationships between partners (Vikat et al., 2007). Among many other variables, the GGS contains data on both fertility and migration histories, making it an excellent source for this analysis.

The GGP has drawn up guidelines and strongly recommends participating countries to adhere to the specified sample design and sampling strategy (Simard & Franklin, 2005). The GGP emphasizes that the target population needs to consist of individuals aged 18-79 who are residents of that country of research. Secondly, they deem it essential that probability sampling is to be applied to make sure units are randomly selected, resulting in an unbiased selection. Lastly, the GGP stresses each sample must contain roughly 9,000 to 10,000 respondents. Overall, these guidelines contribute to high-quality data in comprehensive GGS datasets (Fokkema et al., 2016). Vergauwen et al. (2015) computed population parameters of several GGP-countries with both GGS data and census data and discovered only minor deviations. Ruckdeschel et al. (2016) learned that these differences were mainly direct results of the length and complexity of the interviews, as respondents would learn to shorten their interviews by providing incorrect answers. However, this mainly occurred in the second half of the interview, which primarily contained in-depth questions on partnership dynamics (Ruckdeschel et al., 2016). This research is not concerned with these aspects and will therefore not be hindered by this issue.

Two GGS datasets are used for this analysis: the GGS German sample and the GGS Germany-Turkish sample. The German Federal Institute for Population Research (BiB) carried out data collection for the German sample, through a combination of different sampling methods. To ensure the sample is representative for the whole population, different administrative regions were distinguished, followed by simple random sampling based on addresses in these regions (Fokkema et al., 2016). This sample design has led to a total initial sample size of 20,623. After correcting for non-contact, refusal or other cases of non-response, the dataset holds a total of 10,017 respondents, which were interviewed in 2005 (BiB, 2015). For the Germany-Turkish sample, local immigration authorities were consulted beforehand to establish the total pool of Turkish Germans (BiB, 2019). Thereafter, a similar sampling procedure to the German sample followed. The total sample size accounted for 13,890 individuals. Correcting for non-response lead to a total of 4,045 interviews, which were held in 2006 (BiB, 2019). To stimulate participation to both surveys, a lottery ticket was offered to participants as an incentive.

3.2. Data analysis

For the analysis, filters are applied to both datasets to create a focused sample. For both samples, only women aged 18-45 are included. In the German sample, respondents who were not born in Germany are excluded. In the Germany-Turkish sample, only respondents born in Turkey are selected. With these filters applied, the German sample counts 2,269 cases; the Germany-Turkish sample counts 980 cases.

The analysis consists of two parts. In the first part, an overview of fertility means is shown to discover immigrant-native fertility differentials. To adjust for differences in the age composition between the two groups, the predicted fertility means are computed via a regression model. In this model, fertility is the dependent variable and is measured by the *total number of biological children born per woman*. The independent variables are *age* and *age squared*, the latter of which is added to account for the non-linear relationship between fertility and age (Rodgers & Kohler, 2002). Migrants are sub-divided into groups based on their duration of stay (the reason for this will be explained later on in this section). Then, predicted means of *total number of biological children born per woman* are computed by multiplying the coefficients

of *age* and *age squared* of both groups with the mean observed *age* (and corresponding mean *age squared*) of Turkish immigrants. Finally, the predicted means of the migrant sub-groups are presented and compared with the predicted mean of the German sample.

The second part concentrates on the development of migrant fertility over time. A regression model is developed for the Germany-Turkish sample with *total number of biological children born per women* as the dependent variable. The duration of residence in the host country is added as an independent variable via the variable *years since migration (*YSM*)*, constructed with the variables *age* and *age at arrival in country of destination*. As discussed in section 2.3, adaptation can take place after disruption, leading to a non-linear trend: fertility decreases due to disruptive effects, then increases as the 'catch-up-process' starts, only to decline again as a result of adaptation. Adding YSM as a numerical variable would not account for such non-linear developments. Ford (1990) tackled a similar problem by adding dummy variables containing multiple values of YSM's in the model, with the highest YSM-group functioning as the reference group. By treating YSM as an ordinal variable, both hypotheses can be simultaneously tested: the disruption hypothesis predicts a low coefficient in the lowest YSM-group and subsequent rise of coefficients of the YSM-group thereafter; the adaptation hypothesis anticipates the coefficients of the YSM-groups thereafter to become smaller when YSM increases.

Still, individual characteristics significantly affect fertility behavior as well, which is evident from previous academic work on fertility determinants. To adjust for differences in (micro-level) determinants across YSM-groups, multiple control variables are added to the regression model. *Age* and *age squared* are included in the model to control for differences in age. Controlling for income is difficult since not all women in the Germany-Turkish sample are in employment and therefore have an income. However, all women have declared their highest attained level of education. Accordingly, controls for education are added via dummy variables of *highest education level*. Lastly, controlling for partnership status is done with dummy variables of *current partner status.*

Given that the variable *total number of biological children born per woman* consists of count data, Poisson regression is to be considered for both analyses. However, the variance of the dependent variable is notably lower than its mean (Table 4 in the Appendix), thereby violating the assumption of equi-dispersion of Poisson distribution. This underdispersion might be the result of social norms leading to a desire of (at least) two children among Turkish women (Greulich et al., 2016), leading to an over-representation of women with two children. This evidently is the case in the Germany-Turkish sample, where 34.9% of the women are mother of two children. However, SPSS does not have an appropriate model for underdispersed count data. Therefore, this analysis will proceed with Poisson regression.

3.3. Limitations
Since the analysis of this thesis relies on two cross-sectional datasets, it is impossible to distinguish between age and cohort effects, as age groups and cohorts are identical (Rodgers, 1982). This can bias the results, especially when keeping in mind the possible shifts in the composition of Turkish-German immigrant flows over time (Sirkeci, 2002). This problem could be overcome if longitudinal analysis were available for this thesis. However, such analysis might be too challenging for a bachelor thesis, considering that the bachelor program Human Geography and Planning focusses entirely on cross-sectional data analysis.

4. Results
4.1. Immigrant-native fertility differentials
The outcomes of the first part of the analysis are displayed in Table 1. Predicted means of the *total number of biological children born* per woman –computed at the observed mean age in the Turkish sample– are shown for both samples, together with the corresponding immigrant-native differentials. Additionally, predicted means and differentials are presented for the YSM-groups. The most noticeable result here is the large overall size of the differentials. On average, Turkish immigrant women have approximately one child extra when compared to German natives. Of all YSM-groups, the largest differential is found at women who have resided in Germany for 11 to 15 years (YSM11-15), with Turkish women having an extra 1.191 children on average. Recent arrivals (YSM0-5) have an extra .832 children per women, compared to their German counterparts. The predicted mean for the longest staying immigrants (YSM 25+) is still well above the mean of German natives, with a positive differential of .832 children per woman. These considerable differentials mirror the difference in Total Fertility Rates (TFR) between the countries. At the time of the interview, the German TFR was 1.34; the Turkish TFR was 2.24 (World Bank, 2019).

These results suggest that Turkish immigrants prefer families with more children than their German counterparts, as is also the case in Turkey. A possible explanation is the persisting cultural values and ideals for Turkish women –such as early marriage, preference for a partner of Turkish descent, refusal of childless marriages and the earlier mentioned 'two-child norm'– that are being reinforced by strong and perseverating ties with family in Turkey (Milewski, 2010; Nauck, 2002). This indicates socialization, implying these immigrants stay close to the fertility behavior at their (Turkish) origin due to the continuing influence of ties with family at origin. Still, the five hypotheses mentioned in section 2.1 are not completely incompatible (Kulu, 2005). Even though Turkish migrants exhibit overall higher fertility levels than German natives in each YSM-group, an inverted U-shaped curve can be discovered in the sequence of predicted means (Table 1). In the next part, a comprehensive analysis and discussion of the second regression model will help determine to which extent the presupposed disruption and adaptation mechanisms can be identified.

(Sub)Group	N	Predicted means of total number of biological children born	Differentials (compared with German natives)
German natives	**2,269**	**1.349**	**-**
Turkish immigrants	**887**	**2.328**	**.979**
YSM 0-5	142	2.286	.937
YSM 6-10	141	2.297	.948
YSM 11-15	172	2.540	1.191
YSM 16-20	145	2.453	1.104
YSM 20-25	78	2.301	.952
YSM 25+	209	2.181	.832

Table 1: Predicted fertility means of fertility and immigrant-native fertility differentials computed at observed mean age of the Turkish sample

4.2. Inferential analysis of migrant fertility

The second regression model is used to determine the effect of duration of stay on the fertility behavior of Turkish immigrants. The Poisson regression model is significant with $p<.0005$ and its results are presented in Table 2. The unstandardized coefficients of the YSM-groups indicate changes in migrant fertility over time. The longest staying migrants are the reference group (YSM25+). The most recent migrants (YSM0-5) immediately exhibit the largest deviation, with a coefficient of -.113. The coefficients of the following groups increase and peak at .103 (YSM11-15). After that, they gradually decrease across the remaining YSM-groups. This trend is visualized in Figure 2, alongside with the respective 95% confidence intervals. Overall, these intervals are fairly wide and any significant results are absent; presumably the result of a small sample size (Sheppard, 1999). The trend however is steady and does not show any odd fluctuations in its development.

This model has been corrected for any compositional differences across the YSM-groups. As expected, significant results for the controls for age ($p<.0005$ for *age* and *age squared*) demonstrate there is a non-linear association (resembling a bell-shaped curve) between age and fertility. The unstandardized coefficients for education show a negative relationship with fertility. The category for the highest level of education (*tertiary*) shows a significant negative relationship with both the categories *primary* ($p<.0005$) and *secondary* ($p<.05$). A significant result has not been found when comparing the categories *primary* and *secondary*. Lastly, having a partner shows to have a large significant positive effect on fertility ($p<.0005$). To illustrate the effect of compositional effects, the outcomes of an additional model are shown in which the control variables –with the exception of *age* and *age squared*– are omitted (Table 3). In this reduced model, the coefficients of all the YSM-groups are larger when compared with the full model. Moreover, narrower confidence intervals arise from this model; presumably the result of a greater sample size as more respondents could be included in the analysis (Table 6 & Table 7). Still, the trajectory of these coefficients is similar to the full model's trend and resembles an inverted U-shaped curve (Figure 3). All in all, these outcomes show that these (micro-level) determinants do indeed affect fertility behavior and compositional differences have been adjusted for.

The shape of the full model's trend in coefficients lends support to both the disruption and adaptation hypotheses. First, the disruption hypothesis, which predicts lower fertility in the short period after migration followed by high-fertility thereafter. The negative coefficient of YSM0-5 indicates that the most recent migrants experience the lowest fertility of all migrant cohorts –even lower than that of the longest staying migrants– which is expected when taking into account the disruptive effects of migration mentioned in section 2.3. In the two following cohorts (YSM6-10; YSM11-15) the coefficients become positive and increasingly larger; a swift increase in fertility, implying a phase of catching-up on childbearing. Thereafter, the decrease in the value of coefficients suggests a decline in fertility with an increasing stay in the country of destination. This development signifies that Turkish migrant fertility does indeed undergo convergence towards native fertility in the long term, as the adaptation hypothesis predicts. Even though the fertility does not reach the (low) level of natives –as specified in section 4.1– a convergence toward it can be identified. All in all, these results thus support both the disruption and adaptation hypotheses.

Parameter	B	Std. Error	Sig.	95% Wald Confidence Interval	
				Lower	Upper
Intercept	-3.981	.7347	.000	-5.421	-2.541
YSM0-5	-.113	.1032	.272	-0.316	0.089
YSM6-10	.027	.0926	.770	-0.154	0.209
YSM11-15	.103	.0811	.203	-0.056	0.262
YSM16-20	.062	.0782	.426	-0.091	0.215
YSM20-25	.059	.0923	.522	-0.122	0.240
YSM25+*	0	-	-	-	-
Age	.211	.0430	.000	0.127	0.296
Age squared	-.003	.0006	.000	-0.004	-0.001
Highest education level = primary	.456	.1283	.000	0.204	0.707
Highest education level = secondary	.274	.1247	.028	0.030	0.519
Highest education level = tertiary*	0	-	-	-	-
Current Partner Status = partner	.421	.0906	.000	0.244	0.599
Current Partner Status = no partner*	0	-	-	-	-

Table 2: Regression model outcomes (Full model)
        * = reference category

Parameter	B	Std. Error	Sig.	95% Wald Confidence Interval	
				Lower	Upper
Intercept	-4.897	.6498	.000	-6.171	-3.624
YSM0-5	-.047	.0945	.619	-0.232	0.138
YSM6-10	.052	.0872	.551	-0.119	0.223
YSM11-15	.152	.0754	.043	0.005	0.300
YSM16-20	.118	.0721	.102	-0.024	0.259
YSM20-25	.066	.0878	.454	-0.106	0.238
YSM25+*	0	-	-	-	-
Age	.299	.0385	.000	0.223	0.374
Age squared	-.004	.0006	.000	-0.005	-0.003

Table 3: Regression model outcomes (Reduced model)
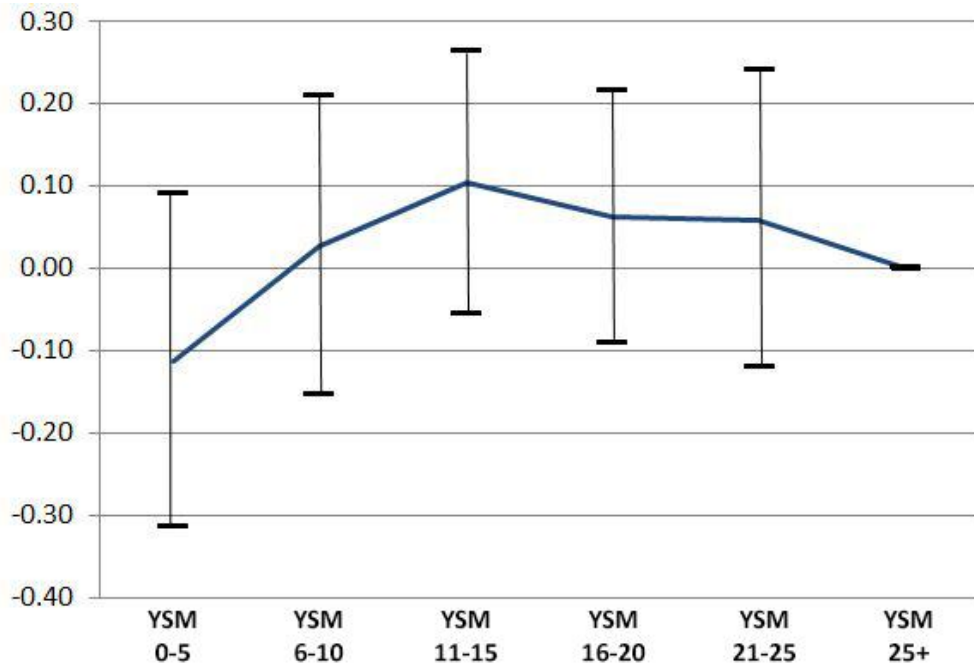   * = reference category

Figure 2: Plotted unstandardized coefficients and confidence intervals (Y-axis)
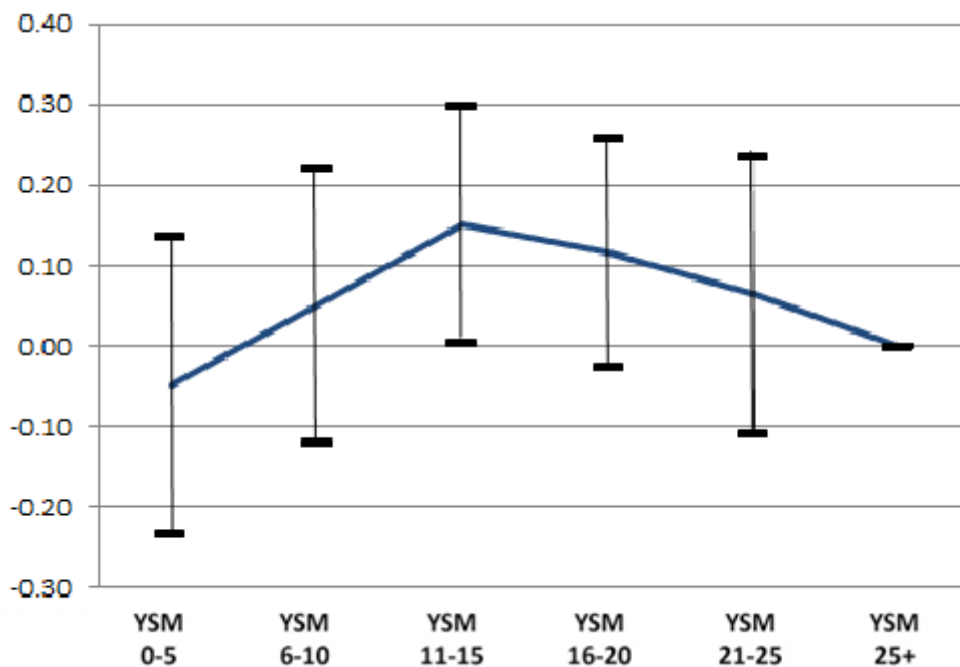*of the YSM-groups (X-axis)*
(Full model)

Figure 3: Plotted unstandardized coefficients and confidence intervals (Y-axis)
of the YSM-groups (X-axis)
(Reduced model)

[12]

Regarding the disruption hypothesis, Wolf (2014) finds contrasting results for Turkish migrant women in Germany. Instead of depressed fertility rates short after migration, elevated birth risks are discovered. This discrepancy might be due to the difference in samples. Wolf (2014) uses a sample of women aged 18-79 to analyze their childbearing between the ages 15-45, whereas this thesis' sample is limited to women aged 18-45. Thus, Wolf's (2014) sample includes earlier migrant cohorts. Women in these cohorts mainly migrated to reunify with their partners and directly start family formation (Sirkeci, 2002). This thesis' sample consists of later migrant cohorts; migrants who generally moved to Germany for asylum and have experienced more disruptive effects than family-reunification migrants of earlier cohorts (Sirkeci, 2002; Yazgan et al., 2012).

Concerning the hypothesis of adaptation, similar studies on the fertility of Turkish immigrants in Germany find results consistent with this analysis (Wolf, 2014; Milewski, 2010). By analyzing the timing of births for Turkish migrants and German natives, both find birth risks of migrants converging to that of natives over time, but only slightly. Still, a considerable gap between migrant and native fertility remains, even for the longest staying migrants. Studies on Turkish migrants in the Netherlands yield similar results: some convergence is discovered, yet complete adaptation holds off (Alders, 2000; Schoorl, 1990). A more recent study on Turkish migrant women in the Netherlands argues that the earlier mentioned persisting values and ideals –such as the 'two-child norm'– keep complete adaptation from happening (Garssen & Nicolaas, 2008). Given the results of this thesis' analysis, it is probable that similar underpinnings keep Turkish migrant from complete adaptation in Germany. Full adaptation of migrant fertility can take multiple generations to ensue, especially when strong cultural norms, values and ideals are still of influence on fertility behavior (Wilson, 2015).

All in all, the results of this thesis suggest that both disruption and adaptation mechanisms influence the fertility behavior of Turkish migrant women in Germany. Nevertheless, there are some limitations to this analysis. First, any results of a cross-sectional analysis can (partly) be due to birth cohort effects, as mentioned in section 3.3. Additionally, differences in migration strategy of migrant cohorts can cause distortions, which can hardly be adjusted for with cross-sectional analysis (Rodgers, 1982). For instance, in the comparison made between this thesis and Wolf's (2014) study, it is apparent how different migration strategies result in different outcomes. Thus, it has to be kept in mind that cohort effects may have an undetectable influence on these results. It is possible to control for these effects and find unbiased results, for instance by analyzing two cross-sections (Ford, 1990) or employing longitudinal analysis (Milewski, 2007). Additionally, any unobserved heterogeneity across the various migrant cohorts can skew the results. The GGS dataset exclusively contains migrants who stayed, thus excluding migrants that have engaged in return migration or subsequent migration. Consequently, earlier migrant cohorts might be overrepresented by a specific group due to the out-migration of individuals with certain characteristics (Cassarino, 2004). Through such selection mechanisms, earlier cohorts will be biased to favor the 'survivors' –the group of migrants who stayed– and thus be considerably different in composition than recent cohorts (Vaupel & Yashin, 1985). Therefore, conclusions drawn based on behavior of the survivors might not be interpreted as findings for the whole population of migrants. Lastly, the analysis is limited by the relatively small sample size. The total of cases that were analyzed is a mere 788, which resulted in a fairly low amount of cases per YSM-group (Table 5 in the Appendix). Consequently, the confidence intervals are fairly wide and significant results are absent. Still, the trend of unstandardized coefficients and their respective confidence intervals is quite consistent in its development (Figure 2), which indicates that both disruption and adaptation mechanisms are present.

5. Conclusion

In this thesis, the influence of the length of residence in the country of destination on the fertility behavior of Turkish migrant women is examined. Poisson regression is used to explore fertility differentials between Turkish migrants women and their German native counterparts and to provide insights into the development of Turkish migrant fertility over the duration of stay in Germany. The analysis is done on the basis of datasets provided by the Generations and Gender Survey. After adding controls for individual fertility determinants, a few conclusions can be drawn. First, the migrant cohort of the most recent arrivals shows the lowest fertility of all, implying that Turkish migrants experience low-fertility initially after migration. According to the hypothesis of disruption, this is the short-term effect of psychological stress and economic costs of migration (or disruptive effects). Thereafter, the disruption hypothesis predicts a rise in fertility levels as migrants catch-up on the missed out childbearing, which also is the case in this analysis. Regarding post-migration fertility behavior in the long term, a downward trend can be identified after the disruption mechanism has worn off. After this point, fertility decreases with an increasing duration of stay, converging to that of natives. This finding is in line with the adaptation hypothesis, which predicts that migrants will mirror the fertility behavior of natives increasingly over time, eventually adopting it. Still, signs of complete adaptation are absent, given that a considerable gap in fertility remains for all migrants; even the longest staying migrants. This finding also points toward a second conclusion. Female Turkish migrants of all migration cohorts are most likely still influenced by Turkish cultural norms, values, ideals and attitudes. This has been found true for Turks in the Netherlands, which shares a similar history of Turkish immigration (Garssen & Nicolaas, 2008). All in all, disruption and adaptation mechanisms are present in the development of fertility behavior of Turkish migration, but the results indicate complete convergence to native fertility holds off.

Still, the results of this analysis are limited in their generalization by a certain lack of statistical power due to the small sample size, potential biases due to unobserved heterogeneity, as well as a not ideal sampling design (the absence of a longitudinal structure). The previously described trend shows to be consistent, which means significant results could be found if this study were to be replicated with a larger sample (Sheppard, 1999). Moreover, the signs of absence of full adaptation provide an interesting direction for prospective research. If indeed Turkish women do not adopt native fertility behavior fully –possible due to persisting Turkish cultural values and norms– it would be an opportunity to study the dynamic between the hypothesis of both adaptation and socialization and discover what factors prompt which mechanism. It might be possible that complete adaptation of Turkish migrant fertility takes more than one generation to occur (Wilson, 2015). Therefore, an additional follow-up study could analyze the fertility of second generation Turkish migrants in Germany to determine if increased adaptation in the second generation takes place.

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Appendix

Variable name	Variable type	N	Minimum	Maximum	Mean	Std. Deviation
Total number of biological children	Ratio	788	0	8	2.08	1.242
Age	Ratio	788	18	45	33.47	6.748
Age squared	Ratio	788	324	2,025	1,165.60	443.839

Table 4: Descriptives of numerical variables in the regression models (Full model)

Variable name	Variable type	Categories	N	Percent
Years since migration	Ordinal	YSM0-5	124	15.7%
		YSM6-10	123	15.6%
		YSM11-15	152	19.3%
		YSM16-20	124	15.7%
		YSM21-25	71	9.0%
		YSM25+	194	24.6%
		Total	*788*	*100.0%*
Highest education level	Ordinal	Primary level	219	27.8%
		Secondary level	520	66.0%
		Tertiary level	49	6.2%
		Total	*788*	*100.0%*
Current Partner Status	Nominal	Partner	687	87.2%
		No partner	101	12.8%
		Total	*788*	*100.0%*

Table 5: Descriptives of categorical variables in the regression models (Full model)

Variable name	Variable type	N	Minimum	Maximum	Mean	Std. Deviation
Total number of biological children	Ratio	887	0	8	2.03	1.279
Age	Ratio	887	18	45	33.22	6.990
Age squared	Ratio	887	324	2,025	1,152.44	455.050

Table 6: Descriptives of numerical variables in the regression models (Reduced model)

Variable name	Variable type	Categories	N	Percent
Years since migration	Ordinal	YSM0-5	142	16.0%
		YSM6-10	141	15.9%
		YSM11-15	172	19.4%
		YSM16-20	145	16.3%
		YSM21-25	78	8.8%
		YSM25+	209	23.6%
		Total	*887*	*100.0%*

Table 7: Descriptives of categorical variables in the regression models (Reduced model)