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# Intergenerational Transmission of Fertility Intentions Among Nigerian Women

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Intergenerational Transmission of Fertility Intentions among Nigerian Women

by

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B.A. Obafemi Awolowo University, Ile-Ife, 2010

A thesis submitted to the  
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The thesis entitled:  
Intergenerational Transmission of Fertility Intentions among Nigerian Women  
written by Adenife Modile  
has been approved for the Department of Sociology.

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

Adenife, Modile (M.A. Sociology)

## Intergenerational Transmission of Fertility Intentions among Nigerian Women

Thesis directed by Professor Lori Hunter

Previous research on intergenerational transmission of fertility has focused on developed nations, and has observed that origin family size is often associated with fertility intentions. However, these associations have not been examined in developing, high fertility countries such as Nigeria, even though intergenerational transmission of fertility is likely to unfold differently. Thus, the current study focuses on women of childbearing age (15-49) in Nigeria and examines how origin family size is associated with preferred family size. Such work is important because in Nigeria family size preferences not only affect population growth, but also have direct consequences for social and economic development. Using data from the 2013 Demographic and Health Survey, the findings indicate that origin family size is positively linked with ideal number of children, and the relationship does not change when controlling for socio-demographic characteristics such as education, household wealth, marital status, religion, and ethnicity. Future research should examine other variables that could affect the relationship between the family of origin size and ideal number of children, and should be replicated in other higher fertility regions in sub-Saharan Africa (SSA).

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## INTRODUCTION

Developing over three decades, a large body of demographic research has demonstrated that parents in Western developed countries transfer family size preferences through socialization processes (Kolk, 2014), social control (Barber, 2001), socio-economic status (Testa et al., 2016), genetic heritability (Rodgers, Kohler, Kyvik, & Christensen, 2001), and societal norms (Ryder, 1976). Indeed, this transmission of fertility intentions has been documented in Western developed countries around the world, from Canada and the United States to Norway and Denmark. Most of these studies examine fertility desires at the population-scale using panel data, typically cohort-based.

However, there is a gap in understanding intergenerational transmissions in high fertility contexts in sub-Saharan Africa (SSA). Such an understanding is important because fertility decision-making and family size preferences have serious implications for population size and structure. For example, an individual's family size preference may affect the distribution of children in a population and the timing of fertility, thereby also shaping fertility among future generations (Bernadi, 2003). In addition, the inheritance of fertility intentions also holds the potential to reproduce inequality through educational and occupational status since parents may invest less in each child's education when they have more children. Family size of origin might influence the intergenerational transmission of socioeconomic status (SES) from parents to children, and such transmissions might also shape fertility desires and outcomes (e.g. Murphy & Knudsen, 2002). Hence, the question as to whether origin family size influences fertility intentions is important for policy and programs designed to reduce fertility rates in the region,

and also essential for understanding the socialization perspective and, more generally, the social forces that shape fertility decision-making and fertility transitions in SSA.

In this study, I examine the relationship between origin family size and expressed ideal family size in a developing country -- Nigeria using a nationally representative sample of women from the 2013 Nigerian Demographic and Health Survey (NDHS). The results begin to fill the gap in understanding of intergenerational transmission of fertility intentions within SSA, while also contributing insight into the conditions under which some mothers desire large families despite challenging social and economic conditions. I hypothesize that a woman's origin family size will be positively related to a woman's expressed fertility among this Nigerian sample. This is also consistent with studies in western settings that have focused on the transfer of fertility. The literature reviewed below describes relevant empirical work on intergenerational transmission of fertility, particularly in western settings, and also demographic and sociological research on fertility norms and family size preferences.

### *Intergenerational Transmission of Fertility Intentions*

The positive relationship between family size preference among parents and their children is well established (Kolk, 2014; Kotte & Ludwig, 2011; Liefbroer & Elzinga, 2012; Murphy & Knudsen, 2002). Past research from Europe and the United States (U.S.) on intergenerational transmission of family size preferences has found relatively modest but significant associations including timing of first birth and marriage (Barber, 2001), and other such fertility related behavioral patterns (Liefbroer & Elzinga, 2012). Linkages have also been found between an individual's marriage and fertility timing patterns as related to their siblings' fertility patterns (Lyngstad & Prskawetz, 2010) as well as the fertility of other kin members (Kolk, 2014).

Research on intergenerational transmission of fertility began in the early years of demographic science including a 1930 study of genetic heritability that found the relationship between the fertility of successive generations is due, at least partially, to a combination in environmental and genetic factors (Fisher, 1930). Likewise, Neel and Schull (1972) identified transmission of fertility desires and outcomes between the number of children and sibship sizes of parents in a population that did not use contraceptives.

Since these early studies, many other researchers have examined the transmissions of fertility intentions in western populations. For example, using data from a representative British survey conducted in 1991, Booth and Kee (2009) showed that in addition to fertility norms having positive and significant effects on completed fertility, men and women from large origin families were significantly more likely to have larger families. Such associations also characterize fertility intentions in Austria, Bulgaria, Italy, and Norway (Testa et al., 2016). The fertility of extended kin (e.g. grandparents and parents' siblings) is also influential (Dubas, 2001; Kolk, 2014; Kolk, Cownden, & Enquist, 2014; Murphy & Wang, 2001). As an example, the number of children one's grandparents had has been found to have a positive influence on an individual's fertility intentions (Murphy & Wang, 2002; Kolk, 2016).

Several key empirical findings are emerging from the growing body of research. In the demographic literature, intergenerational transmissions are shaped by the mother's age at first birth or/and the timing of childbearing. Barber's (2001) work, for example, suggests that mothers who experience early first birth, are more likely to form more positive attitudes, and transmit these attitudes to their children. Interestingly, the effect of family size on the childbearing of women experiencing (i.e. non-marital) births at a young age was significant when women conceived their children before marriage (Barber, 2001). Steenhof & Liefbroer (2008)

demonstrated similar transmissions in the Netherlands. The researchers found that intergenerational transmissions were significant predictors of when individual's enter into parenthood and also when they have their first child. Importantly, the authors found that the degree of transmission from mother to child increased for successive cohorts (Steenhof & Liefbroer, 2008). Such intergenerational transfers are also present among African-American and White daughters in the United States, as daughters of young mothers face significantly higher risk of early entry into childbearing than their older counterparts (Kahn & Anderson, 1992).

Although there are consistent findings regarding the intergenerational transmission of fertility in various western settings, much less attention has been given to this association in sub-Saharan Africa. Given the substantially distinct socio-economic and political contexts, the intergenerational transmission of fertility may unfold differently. Engaging several theoretical perspectives may help guide understanding of these contextual differences. To this end, in the next section, I introduce socialization and demographic transition theories. Next, I discuss two primary hypotheses of fertility norms and how these may shape variation in women's expressed ideal family size.

## **THEORETICAL PERSPECTIVES ON THE INTERGENERATIONAL TRANSFER OF FERTILITY INTENTIONS.**

Two theoretical perspectives offer insight into this intergenerational transfer. First, the socialization perspective asserts that children may adopt norms, values, attitudes, preferences, and behaviors appropriate to individuals as members of a particular culture, with much of this socialization occurring in the family. According to this perspective, parents may transmit fertility intentions to their children both directly and indirectly during their childhood and throughout the life course. Direct transmissions represent the intentional transmission of fertility norms within the children's family of origin, while indirect transmission involves children imitating the family size preferences of their parents, based on what children observe and learn from their parents. Women play a particularly important role in transmitting fertility desires and outcomes, especially to adult daughters, including family size preference, the timing of childbearing, and ultimately the number of children born (Axinn & Barber, 2001; Axinn, Clarkberg, & Thornton, 1994; Barber, 2001; Testa et al., 2016).

Some pathways or processes related to the socialization perspective involve culture and cultural norms. Cultural norms may influence transmission of fertility across generations through three key pathways. The first pathway involves individual fertility-related behaviors and characteristics such as family size preference and the total number of children ever born. These fertility-related characteristics are closely related to cultural norms and have consequences for persistent high rate of fertility in non-western settings. The second pathway involves transmission across generations through social pressure. Social pressure often operates through culture as children's observation of fertility behaviors by those around them might lead them to develop certain norms and beliefs about family size preferences. African women may be

sensitive to influences from the surrounding sociocultural norms about childbearing and may incorporate fertility behaviors, attitudes, and norms of other members of their social environment into their own behavior. This pathway suggest that fertility norms are enforced through social pressures as they operate through the cultural practices of the community. This is consistent with other research suggesting that social pressure leads to the formation of subjective norms (Ajzen, 1991).

The third, and perhaps most important pathway, involves social interaction. As mentioned above, it is likely that children may learn about family size preferences following their experiences and their observations of their parents. Some researchers have documented the importance of social interactions for fertility decision-making in European and U.S. populations (Bernardi, 2003; Bongaarts & Watkins, 1996; Montgomery & Casterline, 1996). For example, some research has suggested that high rates of education (increased return on human capital), income, and economic security, along with correspondingly greater social interaction, may explain the increasing age of first birth for individuals and couples (Kohler et al., 2002).

In Sweden, Kolk (2014) used data from administrative registers up to age 38, and considered how norms are associated with timing of childbearing among women. The author found that women are likely to continue the family size preferences of their parents and suggest that "...the family values and traits transmitted across generations could bear directly on childbearing, but might also be related to ethnicity, religion, or other aspects of culture that are associated only in an indirect way with fertility" (Kolk, 2014, p. 124). Furthermore, at the societal level cultural norms in non-western settings, are often specific to ethnic groups, religious affiliations, gender autonomy, or region, and these factors may play a role in determining the ideal family size. Thus, researchers' conclude that cultural factors such as ethnicity, religion, and

empowerment may moderate the influence of intergenerational transmission in western contexts. However, it is unclear how strong this interaction would be in the context of the high fertility found in SSA.

Beyond the socialization perspective, it is also likely that transmission of fertility norms can spread through other sources. For example, in Nigeria and other SSA settings, the presence of international non-governmental organizations (NGO's) and other related global level actors, such as the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), may influence the fertility preferences and behaviors of women. It is also possible that increased access to education may also increase exposure to messages about family size.

Finally, the demographic transition theory offers a useful perspective on fertility transitions. This theory posits that economic and social transformations -- development or modernization -- tends to lead to smaller family sizes. Theorists have described how western settings have transitioned from high birth rates and high death rates to low birth rates and low death rates in three stages (Davis, 1945; Kirk, 1996). In the first stage, cultures experience relatively high and stable fertility, and then in the second stage, they experience a period of fertility decline. In the third stage, cultures experience low and stable fertility. While many western settings have shifted into stage three of the demographic transition, with some countries having moved to stage four (low births and low death rates), most SSA countries are still in the second stage of the demographic transition. For example, in the transitioning category, fertility in Kenya declined from 4.6 children per woman in 2003 to 3.9 in 2014 (DHS). Likewise, the total fertility rate (TFR) in Namibia decreased from 4.6 in 2006 to 3.6 in 2013. In Nigeria, however, the fertility transition is stalling when compared to other SSA countries (Table 1). One potential explanation for the fertility stalling can be attributed to the persistent intergenerational

transmission of fertility particularly in terms of young women in Nigeria preferring higher family sizes. The lack of stalling as seen in Ethiopia, Ghana, Kenya, and Namibia is perhaps due to women in fertility transitioning context preferring smaller family sizes despite their origin family size. Moreover, declining mortality during the demographic transition is a key determinant and is likely to affect the decline in fertility. Thus, it is plausible, that when the infant mortality in a transitioning context is declining women tend to desire smaller family sizes.

Country	Fertility rate from previous survey	Fertility rate from the most recent survey	Category
Ethiopia	5.4	5.3	transition
Ghana	4.4	4.2	transition
Kenya	4.6	3.9	transition
Namibia	4.6	3.6	transition
Nigeria	6.0	5.7	stalling

Source: Measure DHS. The countries included here are from two surveys since 2003. The most recent survey is no older than 2014.

One pathway through which this change occurs are shifts in economic value or returns associated with having more children. This transition in economic value occurs through a range of societal changes associated with development, urbanization, industrial transformation, and modernization. With regard to fertility decline, individuals in western countries and pre-transitional settings are likely to base their fertility decisions on economic values, including available medical technologies for controlling fertility. However, we cannot necessarily apply what we assume about the demographic transition in western settings to SSA settings, because cultural systems in SSA contexts may be more influential than in western countries (Caldwell & Caldwell, 1987). In this case, we would expect that women from such transitioning context

would be more likely to express higher ideal family sizes resulting in intergenerational transfers of high fertility intentions.

Extending the demographic transition theory to changes in continuity rates in SSA, secularization, preferences, and means have been useful in explaining decline in fertility (Coale, 1973; Davis, 1963, 1945; Teitelbaum, 1975). Secularization is a particularly important precondition of fertility decline, in part due to highly structured prenatal ideologies and pronatalist norms around childbearing intentions. The Nigerian context is salient because such enforcement and dissemination of powerful social norms could be influential in increasing fertility and encouraging individuals to prefer larger families. Additionally, such preconditions for fertility decline are influenced by the status of women, and in particular their level of autonomy in fertility and reproductive health decision making (Coale, 1973).

In all, due to norms of high fertility, normative expectations surrounding having specific numbers of children, and different economic benefits related to childbearing, Nigerian women may report high expressed ideal numbers of children. Additionally, the socialization perspective and demographic transition theory may play important roles in understanding the diverse shifts and generational patterns of childbearing among women in SSA, and also possibly explain some of the economic conditions under which children brought up in large families may likely express similar ideal family sizes as their parents. Therefore, if the relationship between origin family size and ideal family size is best described by the socialization perspective or by demographic transition theory, it would be expected that women from larger origin families would express higher ideal number of children.

*Fertility Transition, Intentions and Rates in Sub-Saharan Africa.*

The most recent annual report on global fertility patterns and trends from the World Fertility Patterns (WFP) demonstrates stark differences in childbearing patterns across the globe. Some researchers have argued that high fertility in the early stages of the demographic transition is the consequence of high desired family size (Bongaarts & Casterline, 2013). SSA has the highest fertility at 4.7 children per woman (i.e., women in Africa have, on average, four or more children). Yet this overall high fertility rate varies substantially by region, ethnicity, mother's educational attainment, and religion. Wealth is also important, with higher socioeconomic status (SES) women having the fewest children (Bankole, 1995; White et al., 2005).

Beyond fertility intentions, several factors could influence the ideal number of children. For example, women living in rural areas where modern contraception is inaccessible may be less likely to achieve preferred family size, regardless of socialization. The importance of geographic factors is revealed in recent research on intergenerational transmission of fertility in western settings (Murphy & Kolk 2014).

In terms of educational attainment, there is also evidence that education shapes the family size preferences of women. For instance, Testa (2014) found that European women who are able to break traditional roles, achieve more gender equality in the division of household labor, attain higher economic assets, and who invest more in education, had a higher likelihood of having more children than their less-educated counterparts (Esping-Andersen 2009; Kravdal & Rindfuss, 2008). In addition, there are other reasons we would expect education to affect fertility intentions of women. First, an individual's fertility can reshape their educational intentions. Second, the level of education of significant others in the households, in SSA this is often a woman's mother, contributes significantly to the adoption of that significant others fertility

intentions. Third, the number of siblings in the family of origin could also potentially affect an individual's own socio-economic status and outcomes, and in turn affect their own fertility (Kolk, 2014). As such, as a woman's level of education increases, she tends to desire fewer children. Importantly, in a non-western setting such as Nigeria, it is possible that higher levels of education for women not only decreases her fertility desires, but may also provide women with greater autonomy in decisions regarding childbearing and fertility overall.

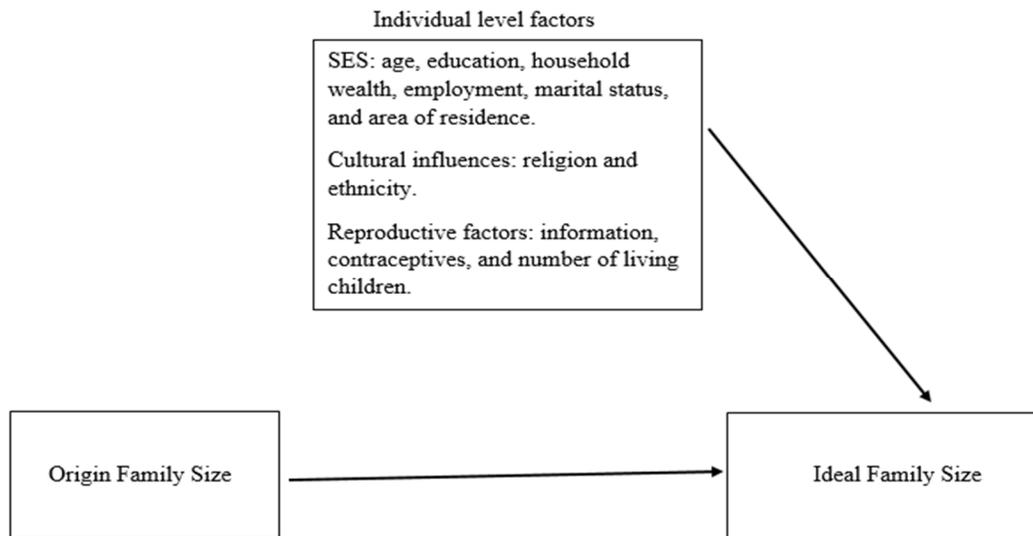


Figure 1, presents the conceptual framework that demonstrates the relationship between origin family size and expressed ideal number of children.

### *The Nigerian Context*

Nigeria is recognized as the most populous nation in the continent of Africa, with approximately 160 million residents and a national growth rate estimated at 3.2% annually (Population Reference Bureau, 2015). Nigeria also ranks seventh in population globally (Population Reference Bureau, 2013).

Unlike the sharp declines in many developed countries as related to the 2<sup>nd</sup> stage of the demographic transition, fertility has remained relatively high in Nigeria throughout the past several decades. (Ibisomi, 2010; Feyisetan & Bankole, 1975). During the 1960s and early 1970s, fertility averaged 6.6 and 7.0 children per woman. Some researchers have documented that the reason for these high birth rates were in part due to the rise in revenue from the exportation of fossil fuel which they argue had profound effects on the welfare and economic status of people, thus encouraging high fertility (Bankole & Bamisaye, 1985). Following an increase in fertility levels in the mid-1970s, the total fertility rate (TFR) slowly declined, reaching 5.4 children per woman in 1980-1982. The 1999 Demographic and Health Survey indicated that TFR had further declined to 5.2. During the same period, reported ideal number of children decreased dramatically from 8.4 in 1982 to 6.7 in 1999 (Measure DHS and Macro 1999).

Fig 2. Fertility rate in Nigeria, 1965-2013



*Source:* National Population Commission Nigeria, 1994, 2000, 2004; Makinwa-Adebusoye and Feyisetan, 1994; ICF International 2014.

Yet following the decline between 1975 and 1980, total fertility rates in Nigeria have increased again in Nigeria in the late 90s and early 2000s (Nwabuisi, 2011). Fertility levels in Nigeria, are often specific to ethnic groups, religious affiliations, as well as education, all of which may play a role in determining one's ideal family size. For example, Hausa women tend to differ from their ethnic counterparts in cultural beliefs and fertility norms and thus may be more likely to socialize their children into having a large family. As mentioned above, the socialization perspective (Watkins, 1996) emphasizes the importance of cultural norms and attitudes in shaping fertility decision making, and such culture is shaped by one's ethnicity. Additionally, women in Nigeria may face societal obstacles such as low SES, job security or other similar factors. Most women continue to want at least six or more children, but there is substantial

variation in intergenerational transmissions of mothers' family size preferences and intentions (Booth & Kee, 2006).

Based on past research on intergenerational transfers of fertility, I present the following hypotheses:

***Hypothesis 1a:*** Women's ideal number of children is positively associated with origin family size.

***Hypothesis 1b:*** Women's ideal number of children is positively associated with origin family size when controlling for socio-demographic characteristics.

***Hypothesis 1c:*** Controlling for the same background characteristics in "Hypothesis 1b", origin family size is still positively associated with women's ideal number after adjusting for the number of living children they already have.

## DATA AND METHODS

*Data.* This thesis uses data collected through the 2012-2013 Demographic and Health Survey in Nigeria (NDHS). The NDHS uses a standard questionnaire to collect information on fertility, family planning, and maternal and child health, as well as demographic and socioeconomic characteristics of the respondents, such as age, education, religion, and region of residence. The NDHS is a nationally representative sample of women aged 15-49, that used two-stage, stratified cluster probability sampling. In the first stage, 904 clusters, including 372 in urban areas and 532 in rural areas, were randomly selected. In the second stage, a representative sample of 40,680 households were randomly selected from within the clusters. Within the interviewed households, there were 17,359 women between the ages of 15-49 eligible to participate in the survey and the overall response rate was 97 percent. One eligible woman within each household was randomly sampled.

I use the DHS's included probability sampling weights to adjust for the probability of households being selected according to this clustered design so that the final sample is representative of the Nigeria women population.

*Measures.*

*Dependent Variable.* I use the ideal number of children as the primary measure of a woman's fertility intentions. Ideal number of children has been extensively validated as a useful measure of fertility intention and has been used in a range of SSA contexts to predict observed fertility and reproductive behaviors (Thomson 1997; Westoff & Ryder, 1977). Additionally, the measure of ideal number of children is an important reflection of sociocultural norms. Responses to the question regarding ideal number of children a woman would like to have, regardless of the number she already has, ranged from 0 to 30.

*Independent Variable.* To capture the family size of origin, I use data reflecting the number of siblings ever born, which ranges from 0-19. I then added 1 to this count to include the respondent in the measure of origin family size.

*Control Variables.* As reviewed above, there are many additional socio-demographic factors that shape fertility and, likely, ideal family size. To isolate the relationship between origin family and ideal family size, these factors must be included as control variables. Age, for example, is included here and measured as a continuous variable, ranging from 15 to 49. Respondent age was also measured as a squared term, since the relationship between age and ideal family size preference is nonlinear in that as women become older the odds of ideal family size decreases (Yeatman, Senott, & Culpepper, 2013). Marital status is also included as a dichotomous measure since this clearly influences fertility. Regarding ethnicity, indicators were included for whether the respondent belonged to one of the four ethnic groups (e.g Hausa, Yoruba, Igbo, and other groups). Religion represents another important control variable since being a Christian, Muslim, or Catholic categories identify primary affiliations within Nigeria including other religious groups. Urban/rural residence is also controlled for in the model since fertility varies by the woman's place of residence (Chimere-Dan, 1990; Kolllehlon, 1986; Hollos & Larsen, 1992).

Given the importance of socioeconomic status to fertility intentions, I introduce controls for household wealth, educational attainment, and employment status. Household relative wealth was included with five categories defined by the NDHS on a scale of 1 "poorest" to 5 "richest". This index is based on a composite measure of the household's cumulative living standard. The four markers of wealth were based on a household's ownership of items such as bicycles and television, type of water access, materials used for household construction, and sanitation

facilities. Respondent's educational attainment is reflected in completed years of schooling, which ranged from 0-20 years. Both informal and formal employment is represented by a dummy variable where "1"=currently employed, and "0"=not currently employed.

Finally, exposure to information was assessed by how often respondents read newspapers, listened to the radio and watched television (1=yes). A dichotomous measure of reproductive information, the respondent's knowledge of contraception was included in the regression models, with no knowledge of contraception serving as the referent. A continuous indicator of the number of living children is also included since having living children might make women express high ideal numbers of children.

#### *Analytic Strategy*

First, I examined the basic univariate distribution for the full sample to identify patterns. Next, I examine the bivariate association between origin family size and the key outcome variable (i.e. ideal number of children) to see whether the theorized relationship is apparent in the data structure. Next, negative binomial regression models were used to investigate the relationship between origin family size and ideal family size. Given over-dispersion (mean=7.88, variance=43.35) of the count of the number of children, negative binomial regression was compared to other count models (poisson, zero-inflated poisson, and zero-inflated negative binomial) by examining model fit statistics (BIC, AIC). For the ideal number of children, negative binomial regression provided the best fit.

## RESULTS

### *Descriptive Statistics*

Table 2 shows descriptive statistics for the full sample of women. There were 16,100 women who reported their ideal number of children. The mean ideal number of children was 6.5. As for the demographic controls, the average age of the women in this sample was 29 and ranged from 15 to 49. The proportion of women in the sample living in urban areas of residence was roughly 42% while 58% of women in the sample live in rural places of residence, and 47% were Muslims, 40% were Protestant, and 11% were Catholic.

Table 2. Descriptive statistics for respondents by socio demographic characteristics

Variable	Mean/Proportions	Std.dev.	N
Ideal Number of Children (Mean)	6.59	6.62	16,100
Origin Family Size (Mean)	6.36	2.58	16,971
Age (in years; range 15-49) (Mean)	28.98	9.92	16,980
Age squared	945.18	617.17	16,980
Education (Years)	8.19	5.16	16,978
Household Wealth (Mean)	3.22	1.38	16,980
Employment Status (1=employed)	0.79	0.41	16,825
Type of place of residence (1=rural, 0=urban)	0.58	0.49	16,980
Marital Status (0=not married)	0.51	0.5	16,980
Religion			
Muslim (reference)	0.47	8.14	8,043
Catholic	0.11	3.12	1,816
Protestant	0.40	3.24	6,880
Other	0.01	5.35	148
Ethnicity			
Hausa (reference)	0.24	2.5	4,060
Yoruba	0.14	8.3	2,329
Igbos	0.12	1.75	2,031
Others	0.50	6.27	8,560
Information (Mean)	1.79	1.04	16,310
Knowledge of contraceptives (1=yes, 0=no)	0.20	0.4	16,980
Number of Living Children	1.83	2.7	16,980
N			16,980

*Source: Nigerian Demographic Survey 2013.*

Note: Estimates accounts for probability weights and cluster adjusted design effect.

I next examined the bivariate relationship between origin family size and ideal number of children. In Table 3, the range of the two scaled variables were truncated at 10+ to ease presentation. The bivariate results revealed that regardless of a woman's origin family size, women still express higher ideal number of children. In fact, it appears that respondents' origin family size had a positive association but was weakly related to a woman's ideal number of children.

Table 3. Bivariate association between Ideal Number and Origin Family Size of Respondents, column percentages.

Ideal Number of Children	Origin Family Size										Total
	1	2	3	4	5	6	7	8	9	10+	
0	0.7	0.2	0.3	0.5	0.4	0.3	0.2	0.4	0.2	0.4	0.3
1	0.2	0.4	0.3	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.2
2	3.6	1.6	2.7	2.6	2.7	2.3	2.0	2.9	2.1	1.5	2.3
3	7.7	9.0	12.4	10.4	11.1	9.4	8.5	6.2	7.1	4.7	8.7
4	17.5	18.8	21.2	25.0	22.7	20.8	20.4	18.6	14.4	11.7	19.5
5	18.9	17.6	16.9	16.8	20.2	19.5	19.0	18.1	16.3	15.1	18.0
6	14.8	11.1	10.2	11.6	11.0	12.4	11.1	12.3	11.9	11.4	11.6
7	6.2	4.7	2.7	4.6	4.2	4.6	5.7	4.6	5.7	4.8	4.7
8	5.5	6.1	5.7	5.1	4.2	5.5	5.3	4.8	4.9	5.4	5.2
9	1.2	0.7	1.1	0.8	0.9	0.8	0.9	1.0	1.2	1.1	0.9
10+	23.7	29.9	26.6	22.6	22.4	24.4	26.7	30.9	35.9	43.5	28.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Demographic and Health Survey, 2013.

Turning to the multivariate negative binomial regression models, the incident rate ratios (IRR) are presented in Table 4. The IRR is the exponentiated coefficient and can be interpreted as the estimated rate ratio for a one unit change in the predictor variables, holding other variables in the model constant. The series of models mainly focuses on the association between origin family size and ideal family size while including several control variables in stages.

Table 4. Negative Binomial Model Predicting the Ideal Number of Children

Variables	Model 1	Model 2	Model 3	Model 4
Origin Family Size	1.037*** (.002)	1.032*** (.002)	1.021*** (.002)	1.019*** (.002)
Age		.986*** (.004)	0.983*** (.003)	1.006*** (.004)
Age Squared		1.000*** (.000)	1.000*** (.000)	.999** (.000)
<u>SES</u>				
Education(Years)		.975*** (.001)	.987*** (.001)	.992*** (.001)
Household Wealth		.849*** (.004)	0.916** (.004)	.939*** (.005)
Employment (ref: employed)		1.029*** (.015)	1.017 (.014)	1.057*** (.014)
Married (ref: not married)		1.126*** (.017)	1.096*** (.016)	.948*** (.014)
Residence (ref: rural)		.959** (.011)	.997 (.011)	.995 (.011)
<u>Cultural Influences</u>				
Religion (ref: Muslims)				
Catholic			.659*** (.008)	.689*** (.008)
Protestants			.649*** (.012)	.679*** (.012)
Others			.799*** (.036)	.814*** (.035)
Ethnicity (ref. Hausa)				
Igbo			.831*** (.017)	.861*** (.017)
Yoruba			.629*** (.011)	.661*** (.011)
Others			0.912*** (.010)	.917*** (.011)
Information				.956*** (.005)
Contraception				.870*** .011
Number of Living Children				1.078*** (.003)
Constant	6.259 (.087)	13.006 (.699)	13.928 (.707)	10.671 (.522)
Log (Alpha)	-1.16	-1.611	-1.864	-1.994
Log Likelihood	-46183.279	-43489.66	-42077.543	-41467.171
Pseudo R <sup>2</sup>	.0398	.0618	.0922	.1054
N	15,745	15,745	15,745	15,745

Source: Nigeria Demographic and Health Survey 2013.

Negative Binomial Coefficients are shown. Standard errors appear in parentheses.

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

Model 1 shows the bivariate relationship between origin family size and ideal number of children. Specifically, if a woman's family size is increased by one person, the rate of her ideal number of children is expected to increase by 3.7% (IRR=1.04,  $p < .001$ ). While this seems like a small effect the family size ranges from 0-30, which would mean that for origin family size of 10 or 20 people, the increase in the rate would be 37% or 74%, a sizeable difference. This result is consistent with previous research and theory that intergenerational transmission is positively and statistically significant.

Model 2 incorporates SES measures including age, education, and household wealth which are found to be negatively associated with the ideal number of children. This result suggest that SES is associated with ideal number of children. Most significantly, the total number of years of education is associated with ideal family size. The results indicate that a one year increase in education is associated with a 2.6% (IRR=.98,  $p < .001$ ) change in the expressed ideal number of children. This is consistent with the idea that educated women tend to desire fewer children. Similarly, women with higher levels of household wealth are less likely to want more children relative to women at lower levels of household wealth (IRR=.86,  $P < .001$ ). Also apparent is the fact that age is an important predictor of ideal family size. Results show that a one year increase in age is associated with a 1.2% (IRR=.99,  $p < .001$ ) change in the expressed ideal number of children. However, this pattern appears to level off over time, as evidenced by the positive coefficient for age squared (IRR=1.00,  $p < .001$ ). With regards to other socioeconomic factors associated with origin family size, the measure of marital status and area of residence are also influential in predicting the ideal number of children.

In Model 3, religion and ethnicity are added to further test the influence of origin family size on ideal number of children. These two cultural measures were statistically significant and appeared to have an effect on the expressed ideal family size but the indicators do little to change the effect of the womans' origin family size. The IRR for origin family size only decreases .01 from 1.04 in model 1 to 1.02 in model 3. Thus, an origin family size of one person is associated with 1.9% more ideal number of children (IRR=1.02,  $p<.001$ ). This finding indicates that once the respondents' demographic factors and cultural influences are controlled for, the outcome of ideal family size remains positively, but weakly, associated with origin family size. As in the previous model, where demographic factors significantly predicted ideal number of children, the measures of cultural influence are associated with ideal family size. For religious affiliations, Muslims appear to want the largest numbers of children. Compared to Muslims, Catholics are expected to have a 35.1% (IRR=.66,  $p<.001$ ) lower ideal family size. Protestants, compared to Muslims, are expected to have a 35.6% (IRR=.65,  $p<.001$ ) lower ideal number of children. Also, other traditional religious groups are expected to have 19.1% (IRR=.79,  $p<.001$ ) lower ideal number of children when compared to Muslims.

With regard to ethnic differences, Igbo women compared to Hausa women are expected to have a 15.81% (IRR=.83  $p<.001$ ) decrease in the rate of ideal family size. Additionally, Yoruba women compared to Hausa women are expected to have a 38.62% (IRR=.63,  $p<.001$ ) decrease in the rate of ideal family size. For other ethnicities, the rate is similar (IRR=.91,  $P<.001$ ). Interestingly, once religious affiliation and ethnicity are added to the model, the ideal family size among women does not appear to be associated with their area of residence. This lack of association may be due to the fact that religion and ethnicity vary primarily by area of

residence in this particular context with Protestant, Yoruba women tending to live in urban places and Muslim, Hausa women largely living in rural places.

In Model 4, after adding other cultural variables such as exposure to information, and contraception and the number of living children to test their influence on ideal number of children, my findings suggest that these other cultural factors and the number of living children are significantly related to the transferal of ideal family size even after controlling for SES (see Table 4). Model 4 shows that other cultural influences are related to the transferal of ideal family size (see Table 4). Hypothesis 1b predicted that after adjusting for the effects of other sociodemographic characteristics and the number of living children women already have, origin family size would be associated with ideal family size. This hypothesis was supported by Model 4 because the IRR's effect for ideal family size were statistically significant but still have little effect (IRR=1.02,  $p < .001$ ) once SES and the full cultural influences are controlled for in the model. With regard to the proportion of variance in ideal number the pseudo r-squared for Model 4 was .105 indicating that collectively these variables explain 10.5% of the proportion of variance in the ideal number of children.

## DISCUSSION

The aim of this study was to examine the relationship between origin family size and a woman's ideal number of children in a developing country (Nigeria). As hypothesized, origin family size was positively associated with ideal number of children (hypothesis 1a). Hypothesis 1b was also supported, in that SES, religion, ethnicity, and reproductive factors are consistent predictive of the ideal number of children among women in this sample. Surprisingly, the place of residence had the weakest influence on the ideal family, although the association was slightly stronger for women who lived in rural areas than for those who stayed in urban areas ( $p < 0.01$ ). With regard to the indicator of number of living children, the association between origin family size and ideal number of children did not change when sociodemographic control factors were included in the model.

Previous research on intergenerational transmission of fertility has emphasized positive correlations, but mostly in contemporary developed countries (Murphy & Knudsen, 2010; Kolk 2014). However, it remains unclear how intergenerational transmission of fertility is unfolding in SSA settings, and whether social demographic characteristics explain the associations between origin family size and ideal number of children. Given current fertility trends related to the fertility of Nigerian women and fertility transitions, important questions still remain about how the transfer of fertility or family sizes contributes to population growth – particularly for a country such as Nigeria (Bongaarts 2008; Ibisomi & Odimegwu, 2007), where the population size is equivalent to the United States. I model the relationship between origin family size among women of reproductive age in Nigeria and ideal family size, using data from the Demographic and Health Survey, 2013.

First, as expected, women from large families are significantly more likely to have higher ideal numbers of children. This finding is consistent with previous research on intergenerational transmissions of fertility in other settings. Second, sociodemographic factors such as education, household wealth, employment, religious affiliations, contraceptive use, and ethnicity appear to play a role in predicting women's ideal number of children, however they do not alter the fundamental association between origin family size and ideal number of children. In addition, the results of this study point to the influence of social context as a potential process through which the transfer of family sizes is likely to occur in Nigeria. Third, I find that once the total number of living children is controlled, the association between origin family size and ideal number of children decreases slightly. For the most part, it could be that women who already have living children might be more likely to want higher ideal number of children.

It is also important to consider the implications of political/historical context on women's fertility intentions. Specifically, this study directs attention to the shift to the new politics of population: the politics of family planning that are evident in Nigeria (Finkel & Mckintosh, 1994). Arguably, the misrepresentation of ethnic and geographical numbers in national population censuses is directly tied to the continued contest for national control and power over economic resources. Such competition and geopolitical sub-population zoning may account for the conditions under which women limit fertility or chose to have larger families but have not been included here.

Consistent with the socialization framework, one key finding is that cultural factors play an important role in shaping transfer of fertility norms and intentions in this setting. However, as previous research has found that SES is more important than cultural influences (Cleland & Wilson, 1987), my findings show adequate support that there is something missing (contextual

influences-including such factors as local norms and kinship network) at the individual level that is driving the transfer of fertility norms, since the association between origin family size and ideal number of children does not change. In a transitioning context, the socialization perspective can help highlight the wide range of other contextual influences that deserves consideration for understanding transmissions of fertility intentions across generations. I would contend that on top of economic and social factors that influence womens' desire for larger families, changes in the structure of the family, social pressure or kinship networks may explain the transmission of fertility intentions in this particular setting. Perhaps more importantly, geographical factors would seem to be relevant. The socialization theory also suggest that intergenerational transfer of fertility intentions is likely to differ across cohorts of women (Kolk, 2014). In other words, respondents born in the earlier part of Nigeria's fertility regime are likely to express different ideal number of children than those raised later.

In addition, ethnic variations in respondents' ideal number of children suggest that, in Nigeria, the cultural influences of fertility intentions, such as religion and ethnicity, influence ideal number of children. This finding supports a study by Kollehlon (2003), which finds that ethnicity contributes to the variation in fertility among ethnic groups in Nigeria, even after controlling for several demographic and social variables. Generally, the importance of ethnic differences has been argued in the literature (Kritz & Makinwa-Adebusoye, 1995). Future research is needed to understand whether such influences are dependent on other factors – as demonstrated through interactions between age and education as well as religion and ethnicity.

### *Limitations*

This study has several limitations. First, the indicator for origin family size was based on individual reports of the total number of siblings (ever born). It is possible that some women in

my sample counted siblings who were no longer in the household or who died before reaching adulthood. A second limitation of this study is that the DHS is a cross-sectional data set, which does not allow for statements about direct causality between origin family size and ideal number of children. Third, women may have reported ideal number of children in ways that conform to the patriarchal ideologies of this setting (Morgan & Niraula, 1995), which may not actually reflect what they desire, but the ideal number based on the preferences of their spouses/partners, or of their communities more broadly. It might well be the case that men or husbands in this context exert pressure on women to express different ideal family size than they themselves desire. Therefore, men's family size preference also need to be investigated. Fourth, the findings of this study may be different for different cohorts of women beyond measures of age in years. It may be that the era in which women's family size preferences were formed influenced the woman's ideal family size. Or, it may also be that differential life exposures to family planning and availability of modern contraceptives during a significant period influenced how women of reproductive age and shaped fertility desires.

#### *Future Research*

Future research on intergenerational transmission of fertility among women can address some of the limitations of this study. Longitudinal data are important for illuminating the sociological processes driving the transmission of fertility and for understanding the true nature of the association between origin family size and ideal number of children. This study might also be extended by considering the influence of women's autonomy since it is an important predictor of ideal family size. Finally, an important question for future research is how the association between origin family size and ideal number of children may differ across cohorts of women.

### *Policy Implications*

This study has important policy implications. The first, SSA countries must implement and promote policies that reduce the desire for larger families among women of reproductive age. Policy makers in Nigeria need to focus on the key challenges of human capital investment including health, education, basic social and public infrastructure, and family planning programs in order to improve social and economic development. At the same time, interventions could be targeted at addressing the cultural barriers, and the fertility regimes of understudied sub-populations, in order to reduce fertility. Importantly, I recommend that in addition to improving access to reproductive health services, researchers and policy makers need to integrate a multi-pronged approach that will work to limit womens' ideal family size on multiple fronts - especially in areas of residence that limit access to reproductive health services. A second policy implication is to adopt my guiding theoretical framework for this study (socialization perspective and the demographic transition theory) when designing and developing policies, especially at the institutional level.

## CONCLUSION

Overall, the findings of this study suggest that origin family size is associated with the ideal number of children in Nigeria, thereby documenting intergenerational transmission of fertility desires. In other words, individuals who grow up in large families are likely to express the desire for higher number of children, even after controlling for sociodemographic and reproductive factors. The current study adds to a growing body of research that demonstrates the well-established positive correlation of intergenerational transmission of fertility in developed countries, a topic that has received less attention in developing, high fertility countries such as Nigeria. Hypotheses 1, 1a, and 1b are fully supported about the relationship between origin family size and ideal family size. Among Nigerian women origin family size is positively associated with ideal number of children. Specifically, the origin family size of one person is associated with 3.7% more ideal number of children. Such association, however, does not change when controlling for SES and cultural influences that are associated with origin family size (Hypothesis 1b). Again, the association between origin family size and ideal number did not change when a number of reproductive measures were added. Findings from the negative binomial models, which controlled for the number of living children, suggested that there was strong support for hypothesis 1c. The ideal number of children increases as womens' number of living children increases. Importantly, the interaction between origin family size and education was evident in this analyses. The results indicate that for women who have higher levels of education, when origin family size is higher, there is a positive association with the expressed ideal number of children. This simply corresponds to a stronger association between origin family size and ideal number as the respondents years of education increases.

These findings represent two potential theoretical contributions that have not been examined together in previous literature. This relationship is robust to the addition of a variety of sociodemographic and socioeconomic controls. The results of this analysis might inform why women are trying to have more children and what characteristics of the woman might lead to intergenerational transmission of fertility. Perhaps women are still being socialized very early on to want to have more children. While the importance of the socialization perspective in influencing intergenerational transfer has been addressed in the literature (Bernadi, 2016), and demographic transition theory has been shown to work well in developed settings (Reher, Ortega, & Sanz Gimeno, 2008), no research to the best of my knowledge has demonstrated the relevance of these two theories together in a developing, high fertility context. Based on the demographic transition theory (discussed earlier), this finding indicates that women in Nigeria express higher ideal number of children in response to key macro level social and economic processes and changes. Therefore, as societies develop/modernize and move from one demographic regime to another, particularly during a period of transitioning fertility (growing up), women in this context express more ideal number of children. In this context of high and transitioning fertility, the origin family size of the respondent is likely to have fostered more intergenerational transmissions than might have occurred in the absence of the demographic transition model. This demographic transition can only take place if Nigeria women break with the large family sizes of previous generations and start new norms about smaller family sizes. The fertility transition in Namibia provides a good case for breaking the link between family size preferences across generation, and suggests that preferring smaller ideal number of children is important for speeding up the demographic transition in Namibia. The TFR in Namibia decreased from 4.6 in 2006 to 3.6 in 2013. Results of socioeconomic characteristics in particular,

to the extent they are based on economic condition showed a significant and positive relationship between origin family size and ideal number of children. The process of socialization as discussed earlier also appears to increase the ideal number of children following the respondents' socialization of childbearing intention through cultural influences, a finding that I found a significant effect and positive association between origin family size and ideal number of children. Therefore, while this research shows a link between demographic transition and socialization theories, it also suggests that socialization theory is an important process in this context. This supports the call made by Susan Cott Watkins (2003) that demographers should pay more attention to the cultural factors and the role of social interaction in demographic and social change. Future research should examine the independent effects of men's ideal number of children, and the degree to which women's autonomy within their household may moderate the relationship between origin family size and ideal number of children. Finally, this work needs to be replicated in other high fertility regions in SSA. Such research would make a significant contribution to our understanding of population dynamics and growth in currently high fertility, developing countries such as Nigeria and other SSA countries.

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