# CONJUGAL TRAJECTORIES, FAMILY STRUCTURES AND SOCIAL VULNERABILITY

## A look at three generations of women in the City of Buenos Aires

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Abstract: Family structure and characteristics are considered an important factor in the reproduction of social inequalities. It has been documented that family structure and its stability correlate with various measures of well-being for children and adults (specially women) involved. In this paper we use a retrospective survey for the City of Buenos Aires involving three different cohorts of women, to explore their conjugal and fertility trajectories. We describe those trajectories with a vector of variables that expand the notion of "fragile families" and use cluster analysis to characterize these trajectories. We find that our indicator of fragility correlates well with variables capturing social vulnerability both in the families of origin as well as in the women's own trajectories. Other findings include an increase in "modern" lifestyles across cohorts, as captured by our indicators; a rise in educational attainment, with non-university tertiary education increasing before university education, indicating a transitional effect; and a higher likelihood of adopting "modern" lifestyles among women whose mothers were the main breadwinners.

## 1. Introduction

Family dynamics have been undergoing significant changes. The second demographic transition has led to the emergence of new parenting arrangements and the expansion of existing ones. As a result, family structures have evolved beyond the traditional two-parent family, with an increase in cohabiting couples, divorced parents, single-parent families, and stepfamilies. This diverse scenario of family structures and marital arrangements leads to heterogenous life course trajectories, trajectories that, according to several previous studies, present a noticeable socioeconomic gradient (Tommasi, Edo & Thailinger, 2023). Focusing on women and children, an important line of inquiry lead by the late Sara McLanahan, a distinguished Princeton sociologist, speaks of "diverging destinies" (McLanahan, 2004). It has been established that, in many countries, women with greater resources tend to delay childbearing, have fewer children, and participate more actively in the labor market; in contrast, those with less education and more limited financial resources tend to split more frequently, have more children, and give birth outside of marriage (McLanahan, 2004).[1]

The divergence in marital trajectories of women is relevant because the choices and experiences of mothers shape the environment in which their children develop. In other words, the differences in the trajectories of mothers may lead to differences in the trajectories of their children, leading to the intergenerational transmission of family disadvantage (Bowles et al 2005, McLanahan and Percheski, 2008, Corak, 2013, Baxter et al 2022). A large literature has established that different family configurations seem to be associated with varied opportunities and outcomes for children. Highly researched areas of child wellbeing in the context of family structure include socioemotional wellbeing, academic outcomes, economic wellbeing, and life course and intergenerational outcomes, such as low weight at birth, educational achievement, and offspring's own marital stability and quality in adulthood.[2] Family structure and its stability seem to be important predictors of the economic, social, and psychological well-being of adults and children. We stress the word "predictor" as opposed to "cause" given the presence of important selection effects, so that the divergent outcomes of children belonging to different

[1] At about the same time, economists Lundberg and Pollack argued that "family trajectories of college graduates have deviated little from the family trajectories of midcentury: almost all children are born within legal marriages, and these marriages are relatively stable. Nonmarital fertility and multipartner fertility is concentrated among women in the bottom third of the income/education distribution, and the marriages that do take place are relatively early and relatively unstable." (Lundberg and Pollak 2007, p 8.). Carlson (2018) document somewhat similar patterns for Europe and Esteve and Florez-Paredes (2018) and Esteve et al (2023) do so for Latin America.

[2] Tommasi, Edo, and Thaillinger (2023) provide a survey of some of those results. In the text we are emphasizing that family structures and trajectories matter for children's outcomes, but of course they matter also for the adults involved, especially women. See, for instance, Watson and Kalkat (2024), Jain and Mahmoodi (2022) (find more references here).

family structures may be attributed not only to the intrinsic configuration of the household, but also to the individual (observable and unobservable) characteristics of the parents (Amato 2005, Aizer et al 2020, Tommasi et al 2023).

The literature has emphasized the connection between children's outcomes both with the structure of the household at one point in time (married parents, cohabiting parents, single mom, ensembled family, etc.) and with the stability of these arrangements. Some authors have explored rich panel datasets available in some countries as well as specific surveys in order to explore the relevance of whole conjugal and fertility trajectories for various outcomes of women and children. For instance, Studer et al (2018) use a Fertility and Family Survey conducted in the Netherlands 2008 to study how cultural and economic macro factors influence family formation trajectories, Lavner et al (2020) use five waves of data the authors themselves collected to explore how the sequencing of parenthood and marriage relates to indicators of marital satisfaction, You and Chen-Lan Kuo (2024) use 19 rounds of the National Longitudinal Survey of Youth from the U.S. Bureau of Labor Statistics following a representative sample of 8984 individuals born in 1980–1984 to study how specific family formation histories seem to impact on earnings, and Fomby and Osborne (2017) use the (Princeton) Fragile Families and Child Wellbeing Study to explore the way in which family instability and multipartner fertility predict childrens' behavioral problems.

In the absence of such rich datasets for some other countries, we provide an initial step in studying conjugal and fertility trajectories for the case of women with children in Argentina using a retrospective survey for the City of Buenos Aires, conducted in 2019, covering three cohorts. We describe those trajectories with a vector of variables that expand the notion of "fragile families" and use cluster analysis to characterize these trajectories. We find that our indicator of fragility correlates well with variables capturing social vulnerability both in the families of origin as well as in the women's own trajectories. Among the main findings, we observe an increase in "modern" lifestyles across cohorts, as captured by our indicators, and a rise in educational attainment, with non-university tertiary education increasing before university education, indicating a transitional effect. Additionally, we find a higher likelihood of adopting "modern" lifestyles among women whose mothers were the main breadwinners, and that fragile conjugal trajectories are associated with lower educational achievements.

Our main contribution is to analyze conjugal trajectories in Argentina in the context of limited data. Although family dynamics have been studied in Latin America in general (Castro Torres, 2021; Esteve, Castro Torres y Becca, 2023; Lesthaeghe, 2020; Lima et al., 2021), the lack of information on the subject in Argentina makes this task particularly challenging. This paper presents the first analysis of conjugal and fertility trajectories in

Argentina, relating those trajectories to social vulnerability. The analysis considers women over their entire life course, rather than categorizing them based on a specific family structure at a particular point in time. The importance of mothers' conjugal trajectories extends beyond the family to broader societal issues. By understanding how these trajectories are linked to social inequalities, we can build a strong foundation for the design and implementation of more effective public policies that can address and mitigate inequalities of opportunity.

## 2. Conceptual Framework

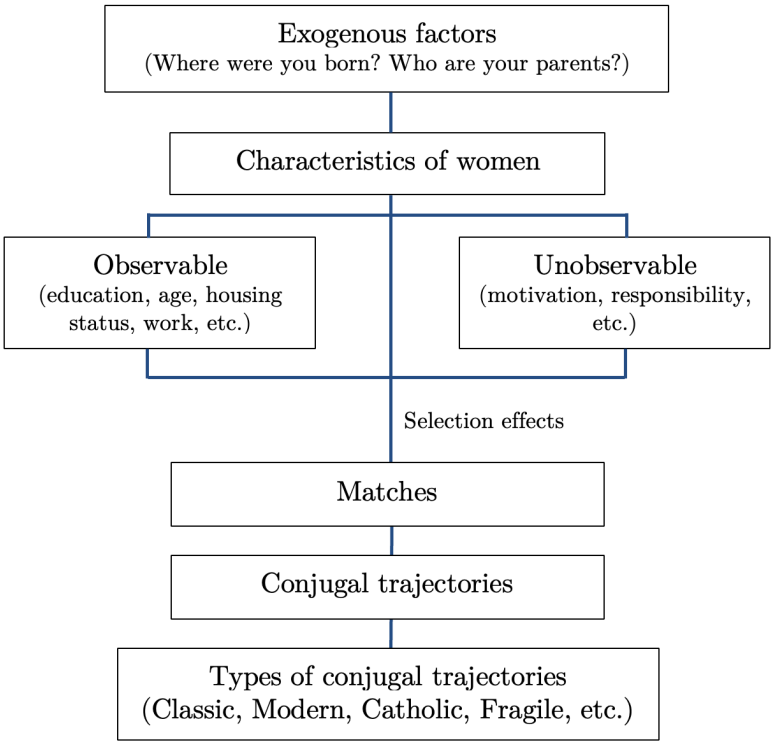
Conjugal and fertility trajectories are the outcome of various decisions taken over each person´s life course, under various constraining and enabling contextual conditions. Figure 1 presents a diagram that permit us summarize some of these dynamics. At any node in time, a person arrives to a matching situation with a potential (sex or life) partner.[3] In arriving at that point the person has a number of "characteristics" inherited from its family of origin (place of birth, characteristics of her parents, socioeconomic and emotional circumstances during childhood) and from her own history. From the point of view of the analyst ("the econometrician"), and depending on the data at hand, some of those characteristics will be observable (such as education, age, housing, employment, etc.), while others, more relating to personality traits, will not. At each matching node, a woman will be matched with a man. A number of social circumstances make some matches more likely than others – the probability that two people in a population actually meet is clearly heterogeneous due to physical and social spaces, and so is the probability that they hook up (for sex or for life) once they have met. Also, a number of circumstances and decisions determine whether a child will be born after each such encounter.[4] That is, some characteristics serve as selection criteria in determining the type of matches that get realized in terms of domestic partnerships, marriages, fertility, etc. After a marriage or cohabitation started, various circumstances over time (including social expectations) will affect the eventual decisions of further fertility, continuation of the match or not, re-partnering, etc. The "trajectories" we will be observing are the ex-post summary of such life dynamics. As explained below, we cluster the observed trajectories in a number of "types" and we construct an index of the "fragility" of these

[3] In this paper we focus on heterosexual matchings, predominant throughout most of the period under analysis, in particular with regards to women with children, the focus of our empirical analysis. Later work should explore the dynamics including same sex couples.

[4] For instance, there is an important amount of work documenting what the literature calls "negative selection" (in terms of observable socioeconomic and less observable personality characteristics) into teen motherhood. More recent research has started to identify also such "negative" selection in terms of the fathers of those children from teen mothers (Aizer et al 2020, Ekéus and Christensson 2003).

trajectories, generalizing the notion of "fragile families". The clustering and the indicator of fragility are then, connected to various aspects of these women socioeconomic histories, those inherited from their families of origin, and the ones they develop over their own life course.

Figure 1 - Conceptual framework




## 3. Data

To carry out the analysis, we used data from the Demographic Retrospective Survey (EDER) conducted in 2019 in the city of Buenos Aires (CABA). This survey provides information on the socio-demographic changes experienced by the population of CABA during the second half of the 20th century and the beginning of the 21st century. The study includes three cohorts of individuals based on their year of birth. The first cohort includes individuals born between 1948 and 1952, who will be between 67 and 71 years old in 2019; the second cohort consists of those born between 1968 and 1972, who will be between 47 and 51 years old in 2019; and the last cohort includes individuals born between 1978 and 1982, who will be between 37 and 41 years old in 2019. To examine the marital trajectories of CABA mothers, we focus on women with at least one child (N = 490).

The EDER's retrospective nature results in an atypical data structure. The survey reports the situation of each individual at each point in time about their partners and children, even if one partner is no longer in the individual's life or if one child has not yet been born.

This implies that there is more than one observation per person per year for those who had more than one partner or child in their life. To work with the data, we needed to modify its structure to a cross-sectional format. This format shows the life trajectory of a single individual in each observation (refer to Appendix A). Figure 2, which appears later in the paper, shows three examples of such trajectories.

Table 1 summarizes the information provided by EDER regarding the various stages of CABA women's lives. Specifically, the data enable us to characterize their family background, personal experiences, and some aspects of the environment in which their children were born and raised. These three stages of life can be described in terms of education, labor market, housing, cohabitation, and health. For instance, the EDER provides information on the education levels of the women in the sample and their parents. Regarding labor market characteristics, we have information on the number of years a woman was employed and the proportion of time spent working in the informal sector. Additionally, the survey provides information on whether the women's parents were employed when they were 14 years old and who was the primary breadwinner in the household at that time. Regarding housing characteristics, we have information on the number of years a woman lived in substandard housing during her childhood (up to age 12) and adulthood (between ages 21 and 40). Cohabitation characteristics of women in the sample related to their family background include the duration of cohabitation with their mother, father and partner of either parent during adolescence (between 0 and 18 years). Cohabitation characteristics for women's children include the number and proportion of years a woman lived with each of her children.[5] Concerning health information, the survey provides information on contraceptive use, in particular, the number and proportion of years that a woman has used any method of contraception.[6] The cohort number indicates the period in which the women were born (1 for older women and 3 for younger women). The lower part of the central column of the table presents the central variables of our characterization of women conjugal and fertility trajectories, that we explain in more detail in the next section. The last column shows what information in the dataset could be distilled about the children of the women in the sample.

[5] The proportion was calculated based on the children's adolescence (between the ages of 0 and 18). For those who were younger than 18 at the time of the survey, the proportion was calculated based on the number of years they appeared in the EDER. To obtain a more complete measure of a mother's cohabitation with her children, we also calculated the average proportion of years spent living with all of them.

[6] To calculate this proportion, we considered two different criteria, depending on the birth cohort. For the two youngest age groups, we calculated the total duration of contraceptive use from a woman's first sexual intercourse to the time of the survey. For the elderly cohort, we calculated the proportion of contraceptive use from first sexual intercourse to the average age of menopause (51 years), as we are interested in contraceptive use for reproductive reasons.

Table 1 - Women and children characteristics

| | | Variables related to family of origin | Women own variables | | Children Variables | |
|---|---|---|---|---|---|---|
| Education | | Education father<br>Education mother | Education | | | |
| Labor market | | Was your father working when you were 14?<br>Was your mother working when you were 14?<br>Main breadwinner at 14 | # years employed<br># years informal employment | | | |
| Housing | | Poor housing during childhood | Poor housing during childhood | | | |
| Cohabitation during childhood | | # years lived with mother<br># years lived with father<br>#years lived with stepparent | | | # years lived with mother | |
| Age | | | Cohort: 1, 2, 3. | | | |
| Health | | | Use of contraceptives | | | |
| Index | Conyugal and family trajectories | | $Y_1$: multipartner fertility<br>$Y_2$: (n)ever married<br>$Y_3$: many children<br>$Y_4$: teen birth | $Y_i \begin{cases} 0 \; if \; no \\ 1 \; if \; yes \end{cases}$ | | |
| | | | **Fragility Index:** $\sum_{i=1}^{4} Y_i$ | | | |
| | Early childhood environment | | | | $V_1$: Absent mother<br>$V_2$: Uneducated mother<br>$V_3$: Poor housing<br>$V_4$: Fragility Index | $V_i \in [0,1]$ |
| | | | | | **Vulnerability Index:** $\sum_{i=1}^{4} V_i$ | |

## 4. Construction of the variables characterizing conjugal and fertility trajectories

We use four variables to characterize a woman's conjugal and fertility trajectory: whether she was a teen mother, whether she had many children, whether she was ever married, and whether she had children with more than one partner. This vector is in some sense a generalization of the fragility definition that inspires the famous Fragile Families and Child Wellbeing Princeton project. That important effort defined potential fragility by whether the birth of a child took place in the context of a married couple or not. We do include a marriage variable in our vector, but we believe that the other three variables help produce a finer predictor of potential difficulties in life circumstances for children and for the mother. For instance, since the norm regarding marriage has weakened across cohorts, it might be quite likely to find women, especially in the later cohorts who have long-term cohabitation with the same partner, and have a small number of children exclusively to that partner, and those women are not likely to come from vulnerable socioeconomic situations, nor to be heading her children towards vulnerability.[7] Relatedly, our multidimensional vector permits a richer characterization of types of trajectories, focusing not only on the "bottom end" of the distribution of vulnerability, allowing us to explore other interesting patterns, relating for instance to degrees of religiosity, or of modernity.

The variable Teen Birth takes a value of 1 if the woman had a child at or before age 19, and 0 otherwise.[8] There is a long literature establishing that children who are born to teenage mothers have worse outcomes, including poorer health, less schooling, and lower earnings in adulthood (Hofferth 1987; Francesconi 2008; Aizer et al 2020). We know also that teen pregnancy has substantial costs for the young mothers, including low educational attainment and earnings (Maynard and Hoffman 2008). As in all of these variables, the correlation between teen pregnancy and, say, children outcomes includes both selection effects as well as some potential "direct" causal impacts.

The variable Many Children takes value of 1 if the woman has three or more children, and 0 otherwise. Associations have been found between the number of siblings and various children's outcomes. Also, when interacted with other of the variables, having to care for a larger number of children imposes more demands on the mother.

[7] This is consistent with the argument (and empirical evidence for Chile) presented in Torche and Abufhele (2021) that the positive correlation between marriage and welfare of children seems to be declining as "the normativity of marriage" declines. This is because the selection effects of being married or not are different over time.

[8] Appendix B describes how the thresholds for cathegorizing the "Y" variables were decided and shows the underlying distributions.

The variable Never Married takes the value of 1 if the woman has ever been married and 0 otherwise (which in our dataset implies 1 or 2 marriages). There is a long literature exploring "the marriage premium." Children born to married parents have better health, behavioral, educational, and economic outcomes than children of unmarried mothers. The advantages associated with marriage start at birth and persist into adulthood. Worldwide, infants born to married mothers are less likely to be low-weight, preterm, and small for gestational age than children of unmarried mothers are, and are less likely to die before their first birthday. Children who grow up with married parents have higher levels of educational attainment and better health, cognitive, and behavioral outcomes than those who grow up in other family settings. As adults, they have higher levels of employment and income, lower rates of nonmarital parenting, and lower rates of incarceration. (Torche and Abufhele 2020 and references there).

The variable Multipartner Fertility takes a value of 1 if the woman has had children with more than one partner, and 0 if she has had children with only one partner. Having children with multiple partners is associated with significant family instability due to repeated changes in family structure (Fomby and Cherlin, 2007; Osborne and McLanahan, 2007), as well as with a number of outcomes for children (Guzzo 2014. Fomby and Osborne 2017).

In order to explore the connection of these trajectory variables with various socioeconomic correlates we combine them in two ways. On the one hand we construct an index which is the sum of the four variables, which have been defined and normalized in such a way that it goes from low to high fragility, with range from 0 to 4. On the other, we construct a set of trajectory "types" using cluster methodology.

As the four clustering variables are binary, we use a mode-based algorithm (K-modes) developed by Huang (1997) to form clusters. K-modes takes as its measure of similarity the distance between an observation and the mode of a cluster. We constructed eight clusters of women using Huang's (1997) algorithm.[9] After the analysis, the results recommended configuring either six, eight, or sixteen clusters for optimal performance. Taking into consideration the trade-off between the number of clusters and the number of observations in each cluster, we decided to form eight groups of women.

Table 2 displays the eight clusters resulting from grouping individuals based on the variables Multipartner Fertility, Never Married, Many Children and Teenage Birth. The numbers inside Table 2, either 0 or 1, represent the modes of these four variables in each

[9] A more extensive explanation of this methodology and the metrics we rely on to select clusters can be found in Appendix C.

cluster.[10]

Table 2 - Clusters

| Cluster | Multipartner Fertility | Never Married | Many Children | Teen Birth | Index | Obs. | Type of trajectory |
|---|---|---|---|---|---|---|---|
| **1** | 0 | 0 | 0 | 0 | 0 | 205 | Classic |
| **2** | 1 | 0 | 0 | 0 | 1 | 18 | Classic/Modern |
| **3** | 0 | 1 | 0 | 0 | 1 | 118 | Modern |
| **4** | 0 | 0 | 1 | 0 | 1 | 85 | Catholic |
| **5** | 1 | 0 | 1 | 0 | 2 | 19 | |
| **6** | 1 | 1 | 1 | 0 | 3 | 16 | |
| **7** | 1 | 0 | 1 | 1 | 3 | 9 | |
| **8** | 1 | 1 | 1 | 1 | 4 | 20 | Fragile |
| **Total** | | | | | | 490 | |

In all cases, the number 1 represents higher fragility in one of the four dimensions considered. We took the liberty of assigning a name to some of the clusters. The least fragile women are referred to as Classic (cluster 1). These women are mothers who had children with only one partner, were married once or twice, had fewer than three children, and did not experience a teenage pregnancy. At the opposite end of the fragility spectrum are the women classified as Fragile (cluster 8). Most of them had three or more children with two or three different partners and never got married. Additionally, all of them experienced an early pregnancy. Women who differ from cluster 1 by never having been married are classified as

[10] Since the values in Table 2 represent modes, not all women in each cluster necessarily have the same values in each variable. Nevertheless, some clusters are entirely homogeneous. In clusters 5, 6, and 7, all women exhibit identical values for the four variables under consideration. In clusters 1, 2 and 4, all women share the same values for the first three variables, but there is some heterogeneity in teenage pregnancy. In particular, 2% of women in cluster 1, 16% of women in cluster 2, and 9% of women in cluster 4 had children at 19 or earlier. Cluster 8 is entirely homogeneous with regard to the variables *Never Married* and *Teen Birth*. However, 25% of women in this group had children with only one partner, and 15% had fewer than three children. Finally, cluster 3 is more heterogeneous than the previous ones. While all women in this group share the characteristic of never having been married, 8% had children with multiple partners, 14% had three or more children, and 2% had children at the age of 19 or earlier.

Modern (cluster 3). Women who have had three or more children, but are otherwise similar to those in cluster 1, are classified as Catholic (cluster 4) – as religion has been extensively associated with higher fertility.

Table 2 also presents the Fragility Index, which is the sum of the four variables we use to create the clusters. Since these variables are binary, the index takes discrete values between 0 and 4. Furthermore, as mentioned above, each clustering variable takes a value of 1 to indicate fragility in a particular dimension. Therefore, the index reaches its maximum value when Multipartner Fertility, Never Married, Many Children, and Teen Birth all have a value of 1, indicating the highest level of fragility. Cluster number 8 is the only one with an index of 4. Conversely, the lowest index value occurs when all four variables equal 0, indicating the lowest fragility. Only cluster 1 has an index of 0, as it is the only cluster where Multipartner Fertility, Never Married, Many Children, and Teen Birth are all 0. In between, there are clusters with indices of 1, 2, or 3, indicating fragility in one, two, or three dimensions respectively.

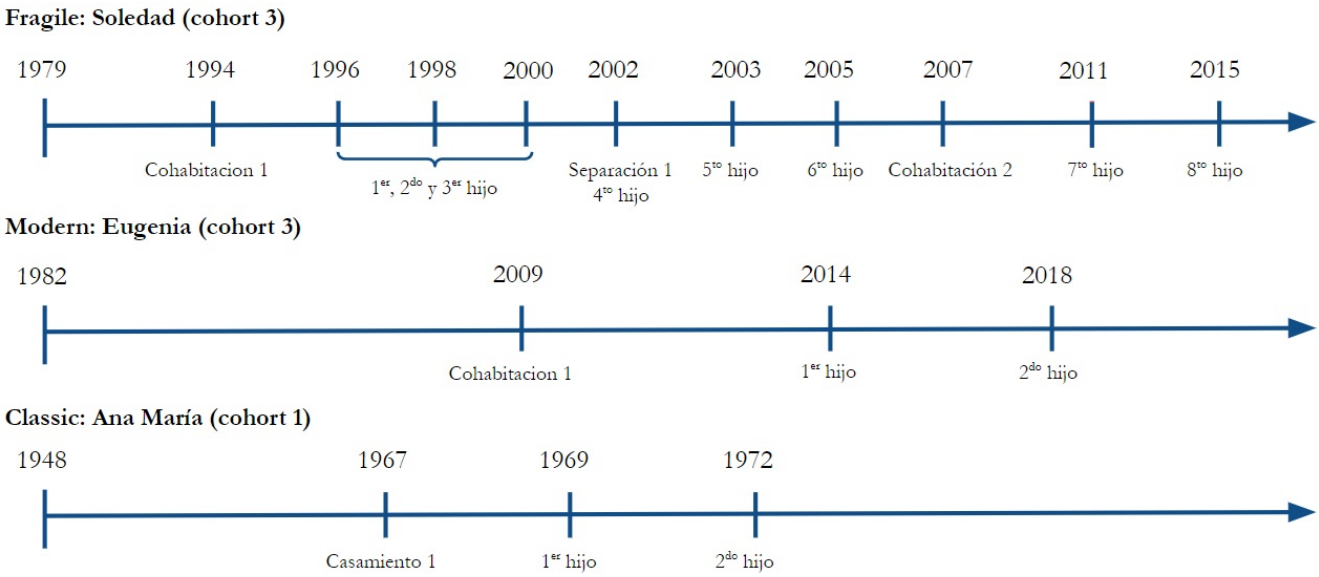
To exemplify the types of trajectories and our clusters, we pick three women in the dataset, assigning them fictitious names. The first story is that of Soledad, a woman born in 1979 (belonging to the third cohort), who at the time of the survey was 40 years old. According to our classification, Soledad is a fragile woman. Let's see why. She cohabits with her first partner at age 17 (in 1994) and two years later they have their first child (1996). This was a teen birth since Soledad was 19 years old at the time she became a mother. With this partner she had three more children (1998, 2000 and 2002), and when the fourth child was born, they separated (2002). Later, Soledad has two children being single (2003 and 2005) and found a rather stable partnership at age 28 (2007). Within this second couple Soledad became a mother for the seventh time at the age of 32 and for the eighth time at the age of 36. In summary, Soledad has all the "red flags" of a fragile woman: she was a teenage mother, never married, had children from different parents, and many more children than the average mother.

Another cluster we could exemplify is the modern woman. To illustrate this, we will describe the life trajectory of Eugenia, a 37-year-old mother at the time of the survey. Eugenia has only one partner, with whom she has been living together since she was 27 years until she was interviewed (2019). She never married, so that they cohabited those 10 years. During that time they had tow children, the first one when Eugenia was 32 and the second child when she was 36, interestingly, the same ages at which Soledad had her $7^{th}$ and $8^{th}$ child respectively. Given that Eugenia never married, but in turn only had children with one partner, had a "small" number of children and did not have a teenage pregnancy, we categorize her as Modern.

Finally, Ana Maria typifies what we call a classic woman. This woman belongs to the

first cohort – at the time EDER 2019 was conducted, Ana Maria was 71 years old. Ana María married her ongoing partner at the age of 19, they have their first child together at the age of 21 and their second child at the age of 24. By the time of the survey they had been married and living together for over 50 years.

Figure 2 - Women life trajectories




## 5. Results

In this section, we present the results of our classification based on different topics, including intergenerational, educational, labor, and other outcomes. To provide a general overview, we have included Table 1D (see Appendix D), which summarizes the means of the characteristics of women and the Fragility Index for each cluster. The clusters are ordered from least fragile (Fragility Index equal to 0), to most fragile (Fragility Index equal to 4).

On average, women with a lower Fragility Index tend to achieve better outcomes than those with a higher fragility. Regarding education, there is generally a correlation between lower socioeconomic status and lower educational attainment. With respect to labor market characteristics, although the proportion of years of employment is fairly uniform across the eight categories, the same pattern is not observed with the proportion of years spent in informal employment. Specifically, there is a positive correlation between informality and fragility. Also based on Table 1D we can also observe that our index shows that greater fragility correlates with worse living conditions in childhood, i.e. more years spent in substandard housing. Furthermore, it has been observed that higher fragility in the clusters is on average associated with lower contraceptive use by women during their reproductive years. Finally, a positive

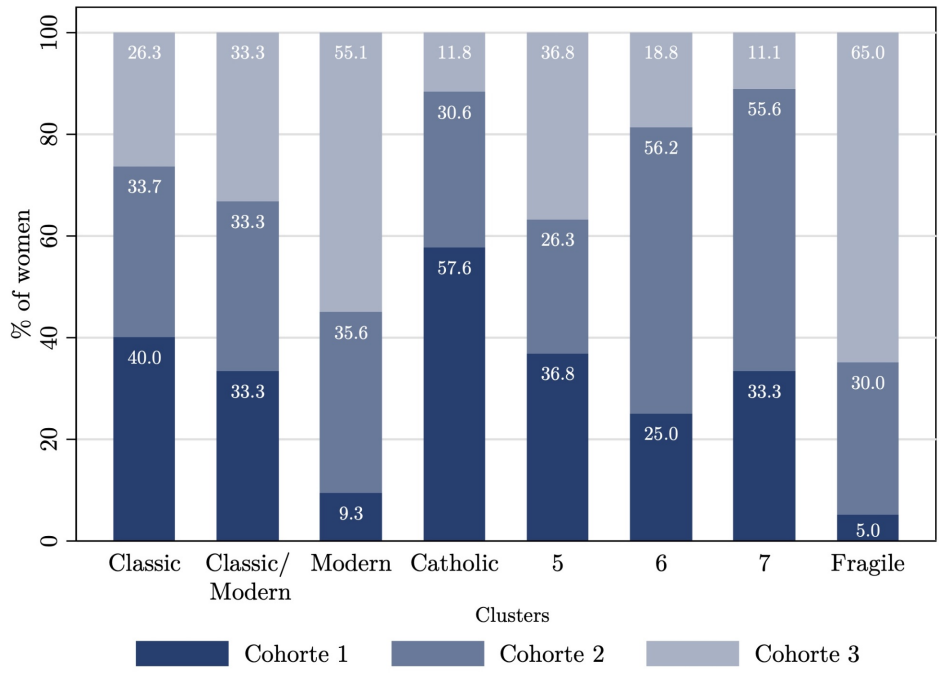
relationship between both indices of fragility and vulnerability can be highlighted.

### 5.1. How did the cohorts change?

The transformation of gender roles and social expectations has been a significant phenomenon in recent decades. In a context where social norms, educational, and professional opportunities have undergone remarkable modifications, it is useful to examine how women of different generations have responded to these changes. Our analysis specifically focuses on the marital and educational dimensions. It outlines the emerging trends and possible sociocultural implications of the variations observed across these three cohorts. Through this exploration, we aim to gain a deeper and more nuanced understanding of the similarities and differences between women in the first cohort (born between 1948 and 1952) and those in the more recent (second and third) cohorts (born in 1968 and 1972, and between 1978 and 1982, respectively).

Figure 3 illustrates the evolution of the different types of women across the cohorts. This allows us to gain insight into the relative importance of each type as societal dynamics shifted over time.

Figure 3 - Types of women by cohort



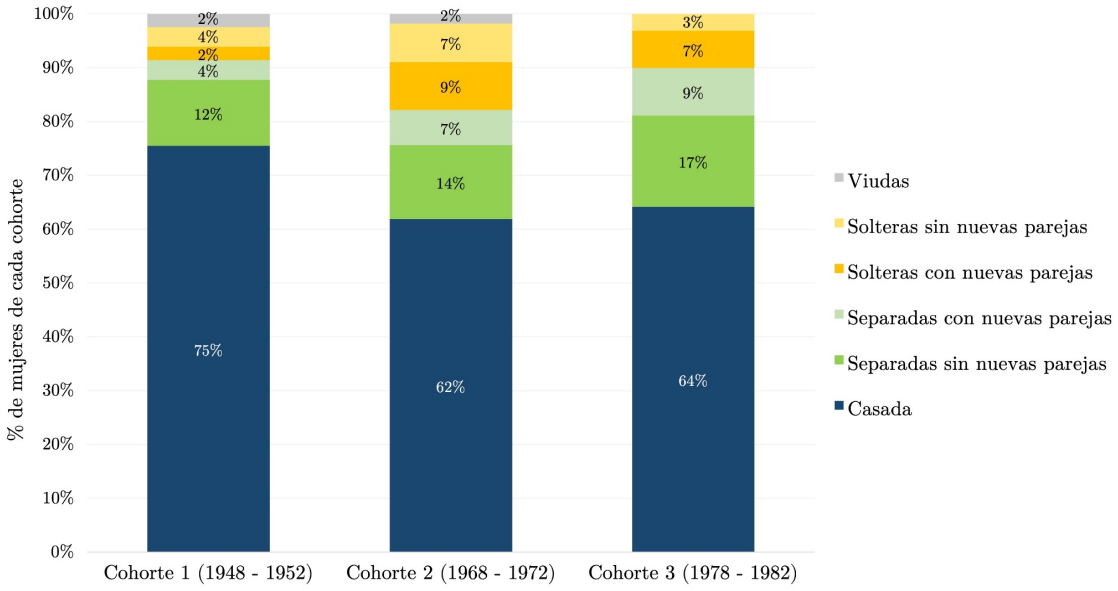

Source: own elaboration based on EDER 2019

Furthermore, this figure confirms the validity of the types defined from the clusters. Firstly, we observe that the proportion of classical women remains consistent throughout the three cohorts. Secondly, it can be observed that the proportion of modern women has increased from 9.3% to 55.1% between cohorts 1 and 3. This indicates that this style of mothering has

become more prevalent in recent years, as societal modernization has occurred. Conversely, the proportion of Catholic women has decreased with cohort number. A very salient fact is that the proportion of women we classify as having fragile trajectories, has increases substantially.

Figure 4 shows the marital status of women at the time of the birth of their first child and in the 10 years following. We aim to obtain a temporal perspective that acknowledges the significance of the environment during the period of children's growth, particularly in their early years, rather than merely capturing a specific moment in time.

Figure 4 - Marital status of women by cohort




Source: own elaboration based on EDER 2019

Figure 4 shows a decline in the proportion of women choosing marriage. In the oldest cohort (cohort 1), 75% remain married, while in the most recent cohort only 64% remain married until their first child is 10. This decline may reflect a weakening of the social norm that views marriage as a lifelong commitment or the belief that getting married is the right thing to do. The decline in marriage rates is accompanied by a significant increase in separation and divorce rates without subsequent formation of new couples, indicating a shift in family dynamics over time. The increase from 12% to 17% between the first and last cohorts may suggest greater social acceptance of marriage dissolution without subsequent formation of new unions.

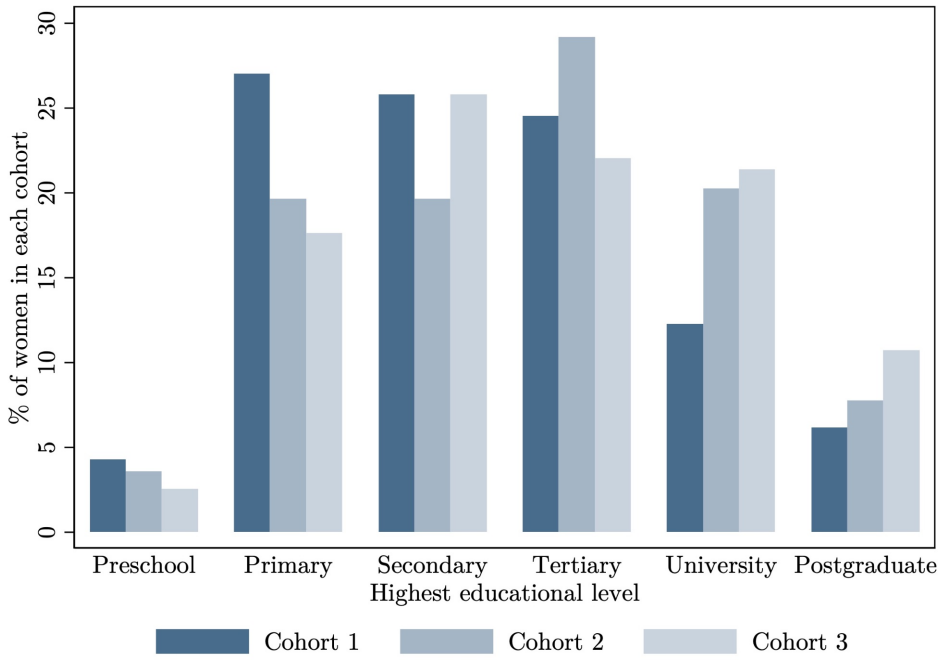
There was also an increase in the number of women who separated and established a new relationship before their child reached 10 years of age. The percentage rose from 4% in the first cohort to 9% in the third, suggesting an increase in step-families. This phenomenon may reflect an evolution in social conceptions about the formation of new unions after the

dissolution of previous ones, indicating greater flexibility in family structures and adaptation to changing circumstances.

Figure 4 also shows that there has been an increase in the number of single mothers, particularly those who form new relationships before their child reaches 10 years of age, in the younger generation. In the first cohort, only 2% of mothers had their child alone and initiated a relationship, compared to 9% in the second cohort and 7% in the third cohort. This may indicate a shift in cultural attitudes towards single motherhood, potentially demonstrating increased acceptance and acknowledgment of women's capacity to manage and organize their own family lives.

Figure 5 presents an analysis of the change in the highest educational level attained by the three cohorts in our sample. The first cohort had a remarkably low proportion of women who obtained university or postgraduate degrees compared to more recent cohorts. Note the high proportion of women in cohort 1 who had only completed primary education. The limited access to higher education at that time may have reflected socio-economic and cultural barriers that limited women's educational opportunities.

Figure 5 - Percentage of women who completed a level of education by cohort




Source: own elaboration based on EDER 2019

In contrast, the increase in the proportion of women who complete university or postgraduate studies in cohorts 2 and 3 indicates progress in education of women over time. This change may be related to the evolution of social perceptions and educational policies that have promoted more equitable access to educational opportunities for women. Additionally,

the relatively high percentage of women in cohort 2 who completed tertiary non-university education is noteworthy. Strategic decisions based on employment opportunities and labor market demands in that period could have influenced the preference for obtaining tertiary degrees. It is possible that the existence of professions traditionally accessible to women at that time, such as teaching and nursing, played a role in this trend, indicating the intersection of gender and socioeconomic factors in educational decisions, and suggesting a transitional phase until in the later cohort university education became more common.

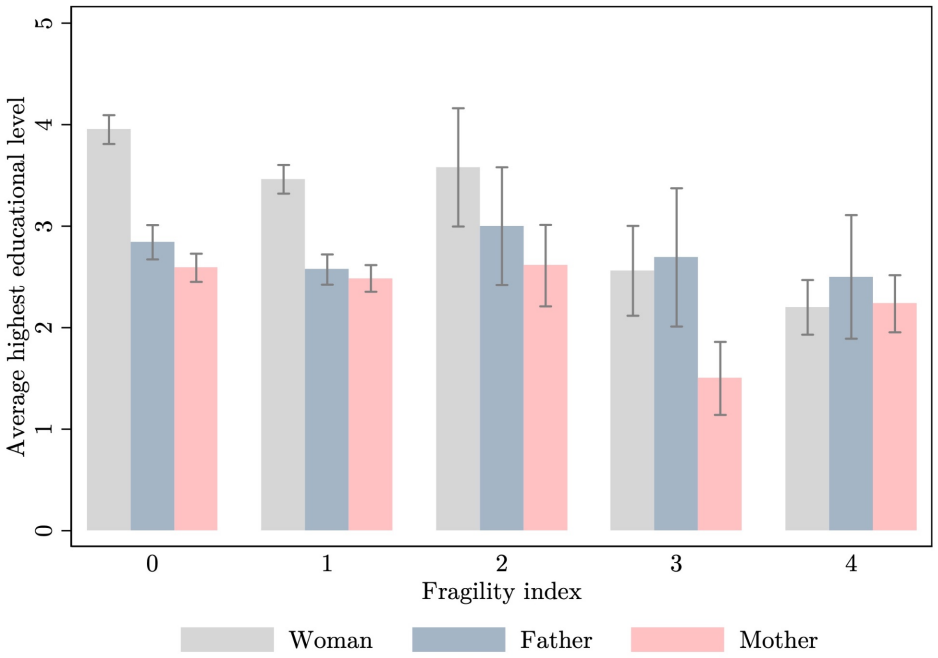
Taken together, these results point to a complex interplay between historical, sociocultural, and economic factors that have influenced the configuration of family structures and the educational trajectories of women in different cohorts. The decline in the preference for marriage, accompanied by an increase in the separation rate without remarriage, suggests a change in perceptions of the continuity of marital unions and the weakening of certain social norms. The rise in the number of women who choose to separate and form new relationships, as well as the increase in single mothers, particularly those who enter new partnerships before their children reach the age of 10, also indicates an adaptation to changing social perceptions about the formation of new unions. There is also evidence of gradual progress towards greater educational achievements for women.

### 5.2. Intergenerational outcomes

In this section, we will limit the database to women who provided concrete information about their past. Fortunately, most of the mothers in the original survey responded to questions about their background, resulting in 396 observations. From there we attempt to draw some conclusions regarding intergenerational transmission.

In Figure 6 we observe the highest level of education attained on average by women, their mothers, and their fathers. This result is differentiated by the Fragility Index.

Figure 6 - Intergenerational transmission of education per index




Source: own elaboration based on EDER 2019

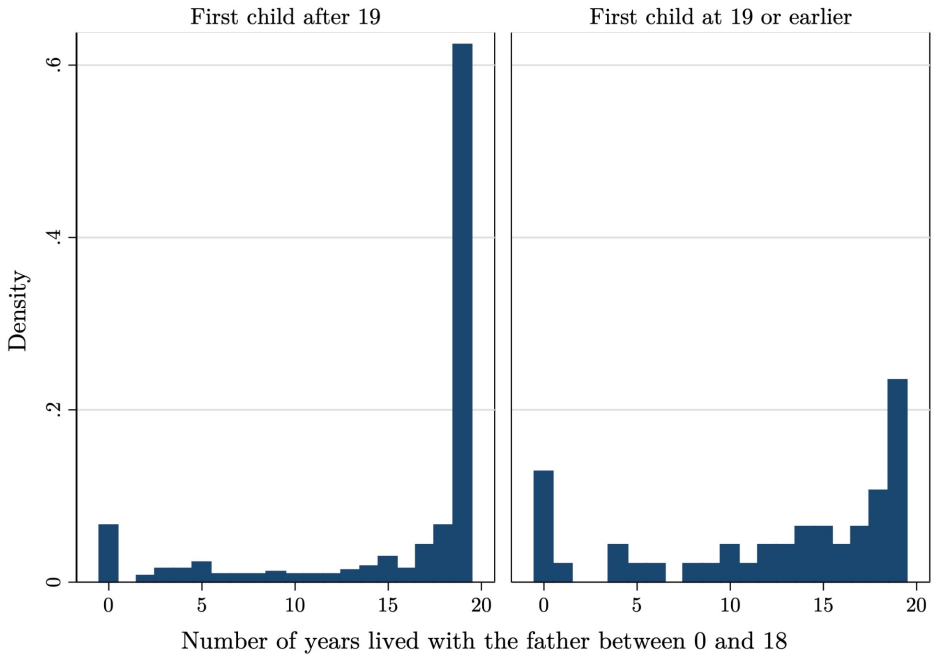
Note: The error bars were constructed using 90% confidence intervals.

Two main conclusions can be drawn from Figure 6. The first is that, for fragility indexes from 0 to 2, women's fathers tend to have a higher level of education than their mothers. This reflects that in the past generation, there has been a clear bias towards the higher education of men, at least within the less fragile women. Social and cultural norms, which tend to be sexist, may have contributed to this pronounced gradient. For example, in the previous generation, women were responsible for domestic and family tasks, so their education was subordinated to fulfilling these tasks. Meanwhile, the role of "provider and protector" in the home was generally assumed by the man in the same family.

Second, one can conclude that female education decreases with increasing fragility. Furthermore, women's education tends to outperform that of their ancestors. Women who are less fragile exceed the education of both their parents. Conversely, the most fragile women inherit the low education of their parents and only surpass their mother's education.

Figure 7 shows the distribution of the number of years a woman lived with her father from birth to 18, distinguishing between women who were teenage mothers and those who were not.

Figure 7 - Distribution of the number of years lived with the father by teenage pregnancy



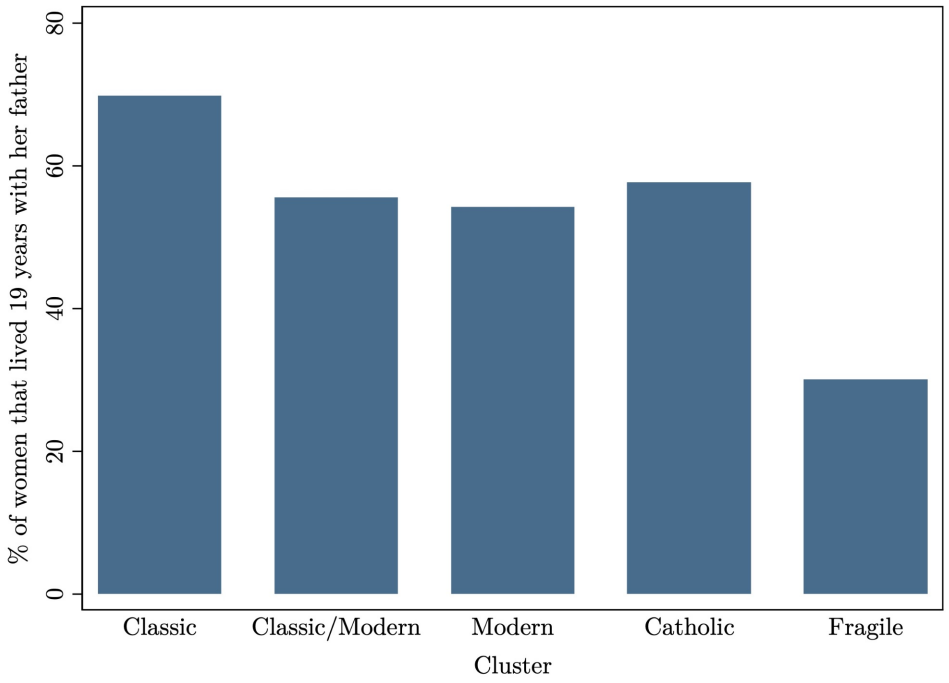

Source: own elaboration based on EDER 2019

In the left panel of Figure 7, we see that the variable of interest has a distribution concentrated in the right tail. This reflects the fact that most women who became mothers after the age of 19 lived with their father throughout their adolescence. On the other hand, the right panel of the same figure shows a more uniform distribution. The latter implies that there is heterogeneity in the number of years that women who were teenage mothers lived with their fathers. Therefore, these results allow us to conclude that women who have a child before the age of 19 have, on average, lived with their father for fewer years during their childhood and adolescence than those who have not had a teenage pregnancy.

The relationship between paternal absence and adolescent pregnancy can be explained in various ways. Firstly, early pregnancy and single-parent (maternal) families are more common among lower-income families (Azevedo et al., 2012). Secondly, paternal absence may lead to a lack of guidance, supervision, or role models, which can affect the likelihood of early pregnancy.

More generally, we can observe how cohabitation with the father during childhood and adolescence varies across the clusters. As shown in Figure 8, there is a positive correlation between fragility and the presence of a paternal figure. 70% of Classic women live with their fathers until the age of 19, while only approximately 30% of Fragile women cohabit with their fathers until the age of 19.

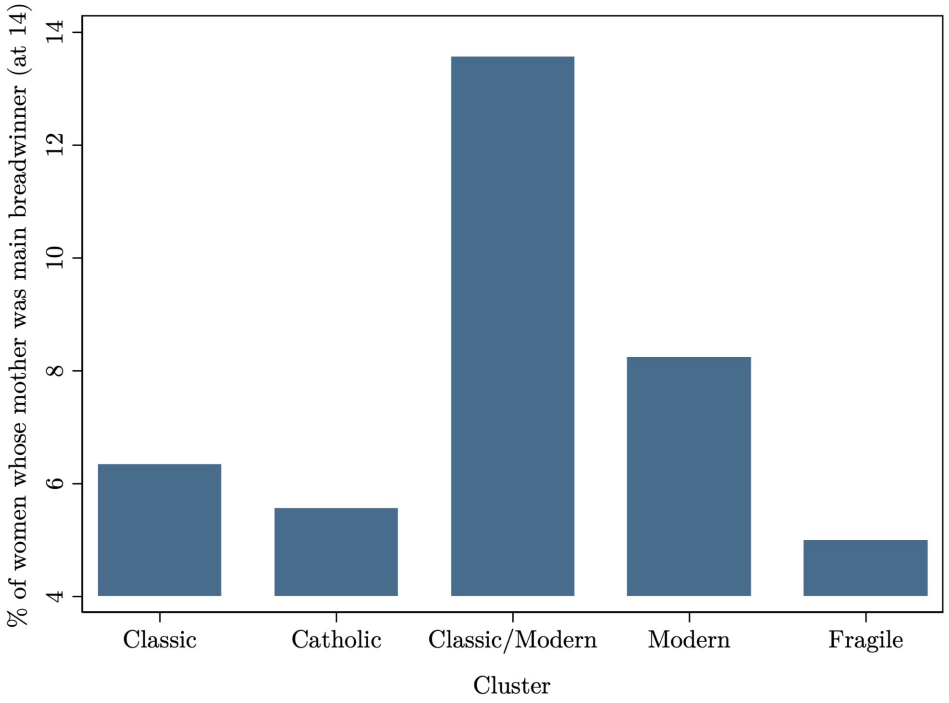
Figure 8 - Distribution of the number of years lived with the father by cluster




Source: own elaboration based on EDER 2019

Finally, we can analyze Figure 9, which illustrates the percentage of women in each cluster whose mother was the main breadwinner when they were 14 years old. We observe a correlation between who was the breadwinner in childhood and the type of woman today. Although most women were raised in households where both parents or only the father was the main breadwinner when they were 14, in comparison with the other clusters, many Modern or Classic/Modern women grew up in households where their mothers were the primary breadwinners. This outcome may be indicative of an intergenerational transmission of the role of women. In households where mothers were the primary source of income, women exhibited a greater propensity for adopting more "modern" behaviors, including a tendency not to marry or have children with numerous partners.

Figure 9 - Distribution of Main Breadwinner at 14 by cluster




Source: own elaboration based on EDER 2019

In summary, these results demonstrate that our place of birth, parental background, and home environment are significant factors in shaping our identities. Exogenous factors, as illustrated in Figure 1, play a crucial role in explaining who we are today. Therefore, it is not surprising to find that women who grew up in atypical families, such as single-parent households with an absent father, are more likely to exhibit signs of fragility, such as teenage pregnancy. However, external factors do not solely determine our path; there is still room for change.

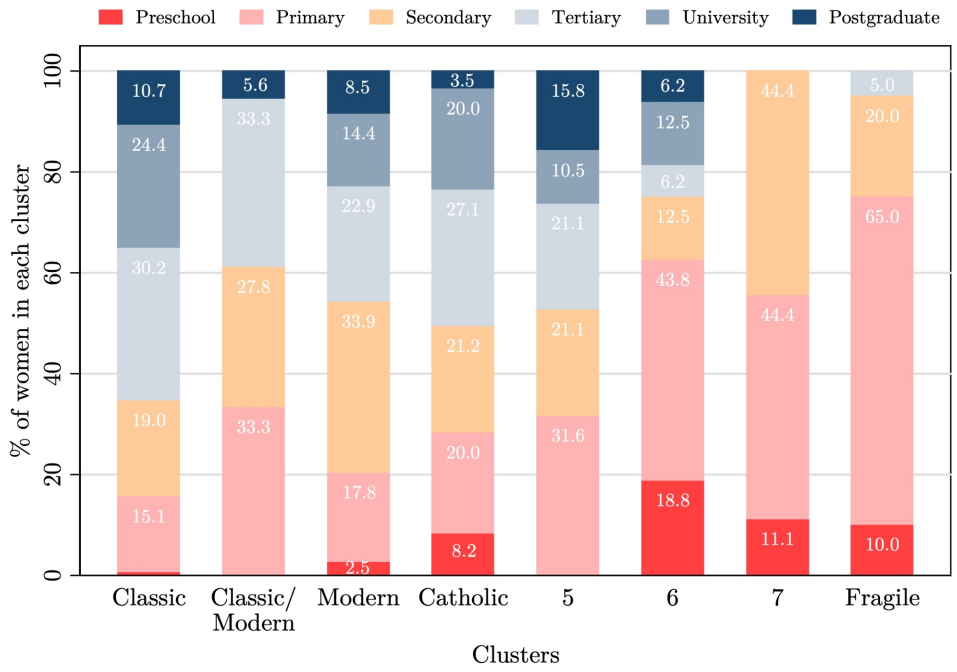
### 5.3. Education and fragility

To gain a more comprehensive understanding of fragility dynamics, it is important to examine the education levels of women in different clusters. This section examines the relationship between the education levels of the women in our sample, the fragility of the constructed clusters, and the variables that constitute the Fragility Index.

Figure 10 provides a visual representation of the educational levels attained by women belonging to different clusters. The least fragile clusters (clusters 1 to 5) have a lower proportion of women with initial and primary education levels. In contrast, the most fragile clusters, located on the right, have a higher proportion of women with initial and primary education levels. At the same time, more women in the less fragile clusters, attained to complete higher levels of education. They complete a tertiary, a university or even a

postgraduate education. This suggests a link between higher levels of education and lower levels of fragility.

Figure 10 - Percentage of women in each level of education by cluster




Source: own elaboration based on EDER 2019

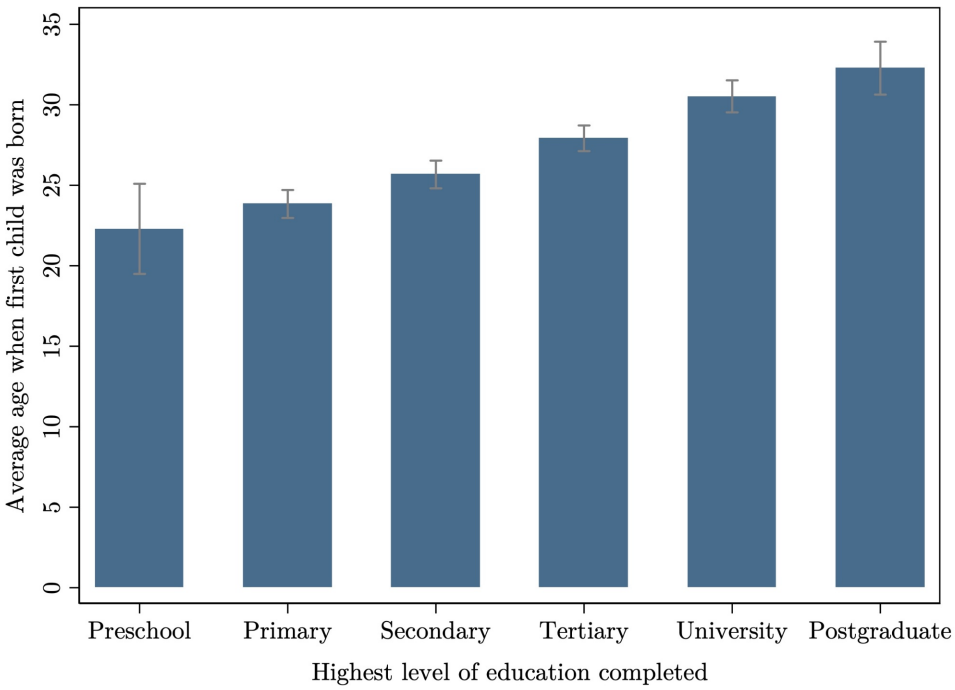
The link between education and fragility is a crucial element in addressing social inequalities. Various factors can contribute to why certain groups of women achieve better education. For example, differential access to financial resources may be one such economic factor. Investment in education, which involves both direct and indirect costs, may be more feasible for women who are less financially vulnerable. Furthermore, the intergenerational cycle of education, as studied in the previous section, may have contributed to a situation where the significance of education is not fully appreciated, due to the historical lack of access to education. This could have a lasting impact on current decision-making processes. Furthermore, women in vulnerable groups may find themselves in economic environments where job opportunities do not demand advanced education levels or, in cultural contexts where education is not considered a crucial element for success.

In addition to describing educational levels according to clusters, it is crucial to analyze the relationship between education and family planning. For instance, Figure 11 and Figure 12 demonstrate, respectively, the correlation between a woman's level of education and the age at which she has her first child, as well as the number of children she has.

Figure 11 illustrates a positive correlation between the level of education attained and the age at which women have their first child. On average, women who attain a university

level have their first child around the age of 30. This finding supports Becker's (1993) hypothesis that women's economic independence is a key factor in delaying childbirth in industrialized contexts. This phenomenon may be attributed to the pursuit of economic stability before taking on family responsibilities. In contrast, women who only complete primary education tend to become mothers at around 22 years of age, thus confirming the link between leaving the educational system early and early motherhood. These observations highlight the intricate interplay of social and economic factors that impact women's reproductive choices.

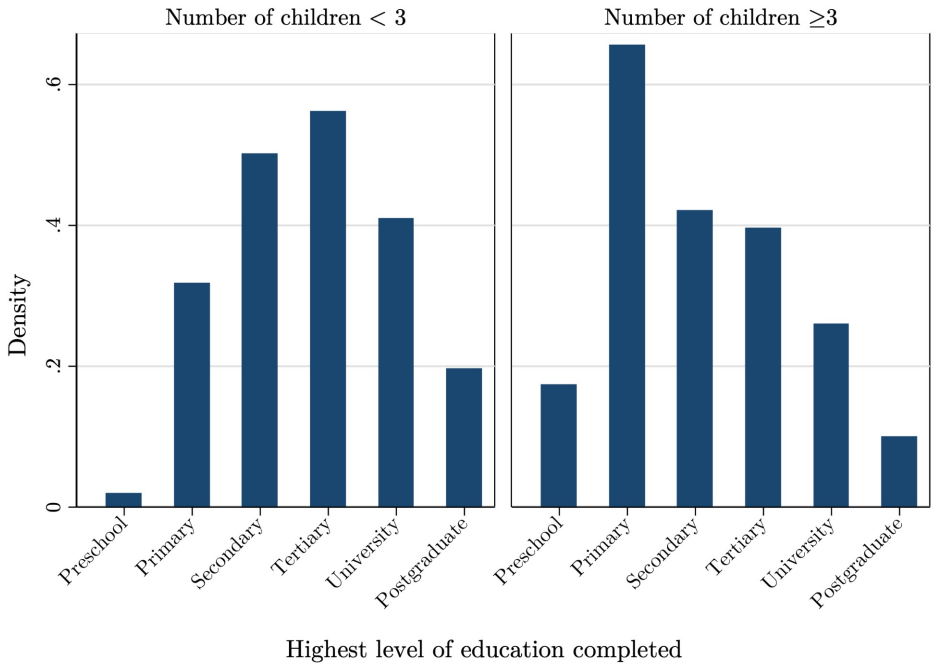
Figure 11 - Age of first childbirth by level of education




Source: own elaboration based on EDER 2019

Figure 12 shows the correlation between the educational level of women and the number of children they have. Women with less than three children have a distribution that resembles a normal, with a higher density in the postgraduate category (upper end) compared to the preschool category (lower end). In particular, the tertiary level shows the most density. Also, higher levels of education (university and postgraduate) have a higher concentration of women with smaller offspring compared to the more basic levels (initial and primary). This pattern suggests that women with smaller offspring tend to be concentrated at higher educational levels. The lower burden of family responsibilities may enable these women to dedicate more time and resources to education.

Figure 12 - Distribution of level of education by number of children




Source: own elaboration based on EDER 2019

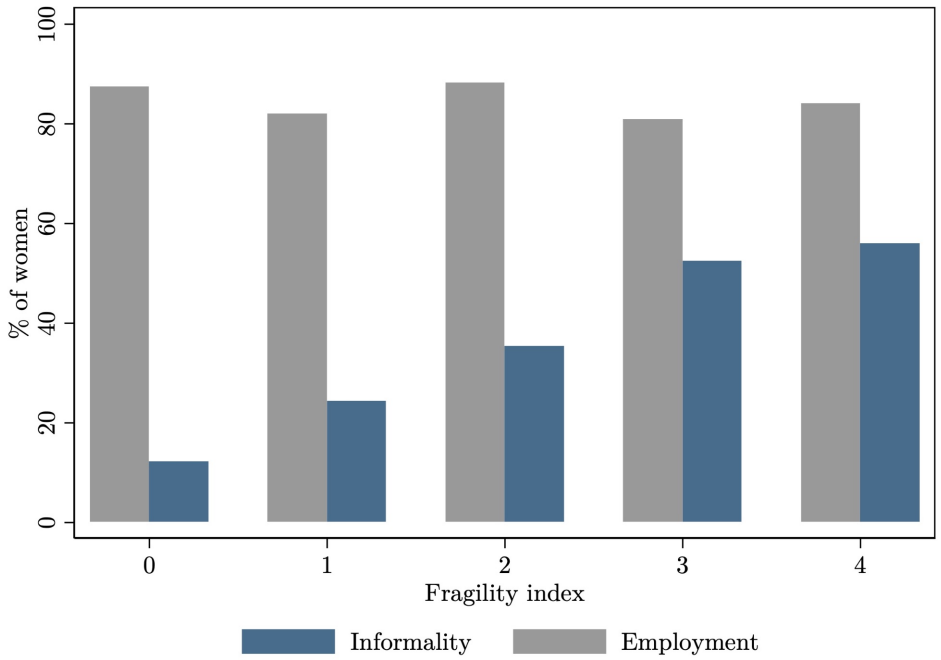
In contrast, mothers with three or more children exhibit a left-skewed distribution, with a high density at the primary level and little density at the postgraduate degree. The peak of the distribution at the primary level and the higher density at the initial level, compared to mothers with fewer children, support the hypothesis of a negative correlation between the number of children and educational level. This relationship can be understood by considering that caring for and raising more children may require significant time, which could negatively impact mothers' participation in the educational system.

In summary, cluster-based analysis confirms that low education is another indicator of fragility. Clusters that are more fragile in terms of family trajectories tend to be formed by women with lower levels of education. In contrast, less fragile clusters exhibit a significant proportion of women with higher education. Expanding our approach to investigate the correlation between education, number of children, and age at first motherhood, we discovered that women with fewer children or who became mothers at an older age tend to have higher levels of education. This suggests that there may be a link between having fewer family responsibilities and greater opportunities for academic success. In contrast, individuals with more children or those who become mothers at a younger age tend to have lower educational levels. This reflects the relationship that may exist between the responsibilities of parenthood and the pursuit of higher education.

### 5.4. Informality and Fragility: two sides of the same coin

In this last section of results, we will analyze the labor market results. Figure 13 illustrates that percentage of women who have more than 25% of employment and informality (in their lives), across the Frailty Index. Most women were engaged in some form of employment for at least 25% of their lives, regardless of their fragility index. However, there is a positive correlation between the Fragility Index and the proportion of years that women spend in informal employment. Fewer than 20% of women classified as Index 1 spent over a quarter of their lives employed in the informal economy. Conversely, almost 60% of the most fragile women (index 4) spent a quarter of their lives working in the informal sector.

Figure 13 - Percentage of women who have more than 25% of employment and informality (in their lives) by fragility index




Source: own elaboration based on EDER 2019

One should note that informality and its counterpart, formality, are not the same phenomenon. According to CAF (2018), formal jobs offer numerous benefits such as higher salaries, access to social benefits, the right to unionization, protection against occupational accidents, vacations, and maternity/paternity leave. However, transitioning from informality to formality is not an easy process. This is due to the high barriers to entry into the formal sector compared to the informal sector, as well as the taxes and contributions that must be paid, which include the loss of cash transfers and social benefits.

In summary, our findings indicate that women who have more children, experience teenage pregnancy, or have a greater number of partners tend to exhibit a higher level of informality in their professional lives. This may be a cause for concern, as informality can have various negative consequences. The women classified as the most fragile are also, on average, the most informal. This creates a vicious circle that could perpetuate their vulnerability. Informality results in short-term disadvantages, such as low wages or poor working conditions, as well as long-term disadvantages, such as the lack of a pension.

## 6. Conclusions

The current context of changing family structures raises questions about the women who adopt different family arrangements, their characteristics, and trajectories. Women's paths show

significant differences, particularly in terms of their socioeconomic position. These differences are relevant because mothers' choices and experiences shape the environment in which their children develop. Taking this into consideration, we suggest classifying and characterizing various conjugal trajectories, with a focus on women residing in the City of Buenos Aires.

We conduct a cluster analysis to form eight groups of women using four grouping variables: Multipartner fertility, Never married, Many children, and Teen birth. To perform the analysis, we used data from the Demographic Retrospective Survey (EDER) conducted in 2019 in the Ciudad of Buenos Aires. The survey provides information on the sociodemographic processes experienced by the population of CABA during the second half of the 20th century and the beginning of the 21st century.

This analysis identifies changes among women in the City of Buenos Aires. Specifically, we observed differences and transitions between mothers in the first cohorts and younger mothers. Among the main findings across cohorts, we observe that fragility has increased substantially, as well as education, with a transitional effect in which non-university tertiary careers picked earlier than university studies for women who are mothers. Additionally, we find that "modern" lifestyles, as captured by our indicators, have increased (what validates our clustering), marriage has declined, and single motherhood has increased across women cohorts.

Another important finding is the role of intergenerational transmission. More fragile women inherited their parents' low level of education, whereas women who were less fragile managed to surpass their parents' education, sometimes by a wide margin. Additionally, we discovered that women are less likely to become teen mothers if they lived with their father. Furthermore, we found that the identity of the breadwinner during childhood is associated with the type of trajectory a woman has – women in whose home of origin the mother was the main breadwinner are more likely to have modern lifestyles.

The classification of the women in the sample into eight clusters enables the study of correlations between their conjugal trajectories and certain observable characteristics. Specifically, having children with multiple partners, remaining unmarried, having many children, and experiencing teenage pregnancy are indications of fragility. The cluster analysis, along with the constructed index, suggests that more fragile trajectories are associated with poorer outcomes, such as lower levels of education, greater labor informality, and increased vulnerability.

Classifying women's trajectories is important not only as a purely economic and descriptive exercise but also for the purposes of public policy. Such categorization can be useful to identify, broadly speaking, those women who are more disadvantaged and who should be

targeted by certain social assistance programs. Although this study may have limitations in terms of external validity as it only considers women from CABA, it is a good initial step towards understanding the marital trajectories of our country. Ideally, the clusters created should be extrapolated to any sample, at least in Argentina. This possibility is left open for future research.

# Appendix

## Appendix A: Modification of the database

The main problem with the EDER is that it reports the situation of women in each retrospective to each child and partner. This implies that there is more than one observation per person per year for those who had more than one partner or child in their life. To illustrate this we can turn to Figure 1A, which shows an example of a woman with two children and two spouses (one married and one cohabiting).

Panel A of Figure 1A illustrates the issue for the woman with ID 52-1-1, there are two observations for each year due to the reporting of both her children, even before their birth. Similarly, Panel B shows that although the woman was married to her first spouse in 1998 and had no relationship with the second, the existence of the second partner is still reported. In 2008, despite having divorced her first spouse, the woman continued to report her situation with respect to her second partner. Additionally, her cohabitation with the second spouse is also reported.

The database's unconventional structure presents challenges for working with it. To address this, we converted it to a cross-sectional format. This modification ensures that each observation corresponds to a single woman and reflects her life trajectory. Figure 2A displays the resulting data structure. In variables related to couples, the indexes denote the number of partners. When referring to variables related to children, the first index corresponds to the number of children and the second to the number of spouses.

Figure 1A - Illustration of the database problem

| Spouse database | | | | Children database | | | |
|---|---|---|---|---|---|---|---|
| ID | Spouse | Marital status | Year | ID | Child | Year of birth | Year |
| 52-1-1 | 1 | Marriage | 1998 | 52-1-1 | 1 | 1999 | 1998 |
| 52-1-1 | 2 | - | 1998 | 52-1-1 | 2 | 2010 | 1998 |
| 52-1-1 | ... | ... | ... | 52-1-1 | ... | ... | ... |
| 52-1-1 | 1 | Divorce | 2001 | 52-1-1 | 1 | 1999 | 2001 |
| 52-1-1 | 2 | - | 2001 | 52-1-1 | 2 | 2010 | 2001 |
| 52-1-1 | ... | ... | ... | 52-1-1 | ... | ... | ... |
| 52-1-1 | 1 | Divorce | 2008 | 52-1-1 | 1 | 1999 | 2008 |
| 52-1-1 | 2 | Cohabitation | 2008 | 52-1-1 | 2 | 2010 | 2008 |

Panel A Panel B

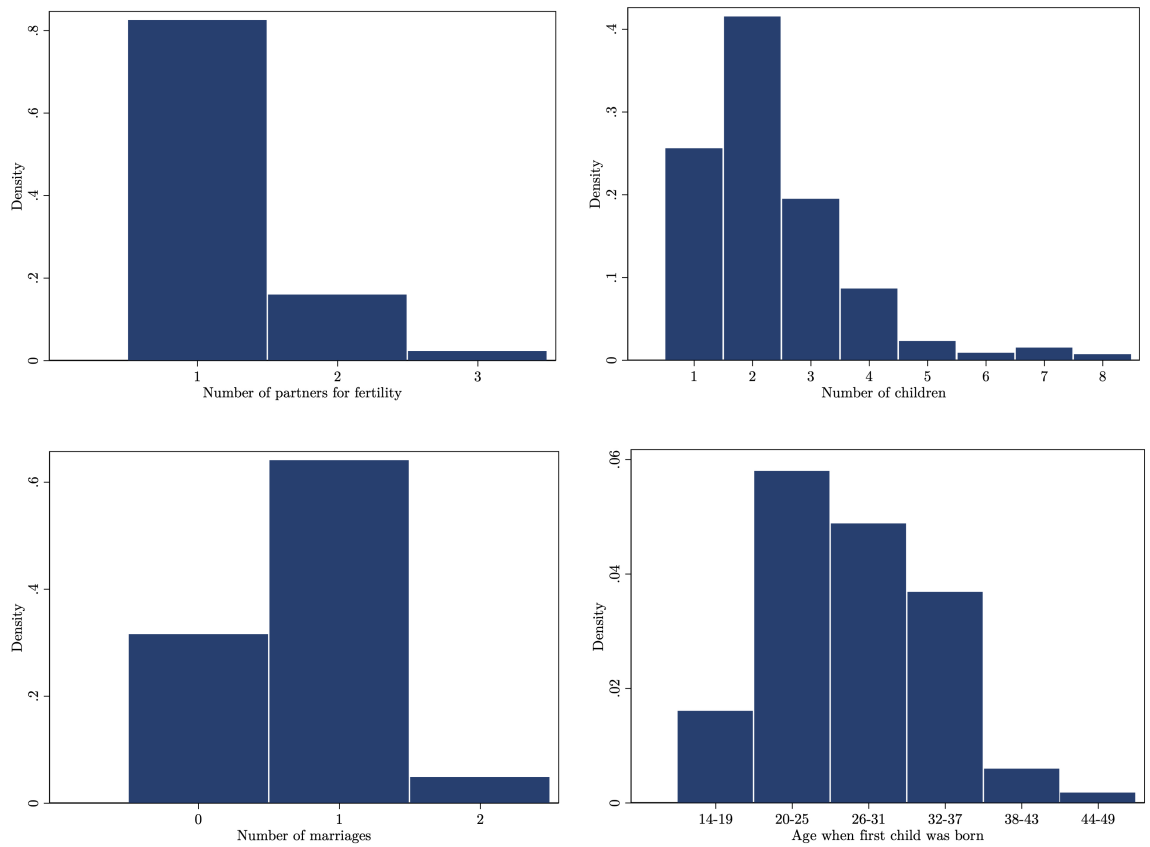
Figure 2A - Illustration of the solution (cross-section format)

| Id | marriage1 | year_marriage1 | divorce1 | year_divorce1 | cohabitation2 | year_cohabitation2 | child1_1 | year_birth_child1_1 | child2_2 | year_birth_child2_2 |
|---|---|---|---|---|---|---|---|---|---|---|
| 52-1-1 | 1 | 1998 | 1 | 2001 | 1 | 2008 | 1 | 1999 | 1 | 2010 |

## Appendix B: Threshold and Distributions of our Y Variables

When deciding the categories for each of these four binary variables, we used different criteria. Our interest was in the extensive margin for both Multipartner Fertility and Never Married. This means that we aimed to differentiate those women who had children with only one partner from those who had children with many partners, regardless of the number of partners. Similarly, we aimed to differentiate between women who never married and those who have been married at least once, regardless of the number of times. Conversely, in order to define the threshold of the variable Many Children, it was considered that the average number of children a woman has is approximately two, not only in Argentina but also in the rest of Latin American countries (Ministerio del Interior Argentina, 2021). Therefore, it was determined that having many children implies exceeding this average. Regarding the Teen Birth variable, we adopt the definition used in previous literature (CEPAL, 2007), which defines early pregnancy as occurring when the woman is 19 years old or younger. Appendix B presents the distributions of the number of children, marriages, couples for fertility, and age at which the women in the sample had their first child.

Figure 1B - Distributions




## Appendix C: Selection of the number of clusters

Huang's (1997) algorithm uses a dissimilarity measure to compare categorical data and quantify differences between two objects. The dissimilarity measure between two categorical objects X and Y with m attributes is defined as the total number of mismatches in the corresponding attribute categories of the two objects. Formally:

$$d(X, Y) = \sum_{j=1}^{m} \delta(x_j, y_j) \quad (1)$$

where $\delta(x_j, y_j) = 1[x_j = y_j]$. The fewer the number of mismatches, the more similar the two objects will be, and the smaller the distance. The K-modes algorithm minimizes the following cost function to construct the clusters:

$$C = \sum_{l=1}^{k} \sum_{i=1}^{n} y_{i,l} d(X_i, Q_l) \quad (2)$$

where k indicates the number of clusters; n refers to observations; $y_{i,l}$ is an element of the partition matrix $Y_{n \times k}$ (a tabular representation showing how data is assigned to different clusters); $X_i$ is a vector of categorical objects for individual i; $Q_l$ is the mode vector of cluster l; and d is defined as in (1). In simple terms, a woman is assigned to cluster l if she is closer to the mode of l in each of the four mentioned clustering variables.

The K-modes algorithm requires the predefinition of the number of clusters. Two criteria are considered for this purpose. On one hand, we analyze the silhouette score, an index

that assesses the accuracy of assigning an observation to a particular group rather than another by measuring both inter-group and intra-group separation (Rousseeuw, 1987). The silhouette score is used to measure the similarity of observations within a cluster and their distinctness from other clusters. On the other hand, the cost function is examined, which indicates higher similarity as its value decreases. We evaluate the values obtained in both measures for a range of clusters between two and sixteen.

There is a trade-off between the number of clusters and the number of observations in each cluster. A larger number of clusters can be beneficial because it implies more homogeneity among individuals in the same group. However, it also reduces the number of observations within each cluster. Due to this trade-off, there is no objectively correct number of clusters. Therefore, as we have outlined, we rely on the silhouette score and clustering cost to determine the optimal number of clusters.

Figure 1C displays the Silhouette score for a range of clusters from two to sixteen. A higher score indicates better clustering of observations, with lower dissimilarity within each cluster than between clusters (Rousseeuw, 1987). Similarly, Figure 2C shows the cost of the clustering process. It is observed that with six, eight, or sixteen clusters, the score reaches relatively high values, and the costs reach local minimum values. However, creating sixteen clusters would result in too few observations within each cluster. On the other hand, while creating six clusters may not be a bad option, we believe that creating eight clusters is a better choice. We could improve the homogeneity of the groups by forming eight clusters instead of six, without a significant loss in the number of observations. Therefore, we divided the women in our database into eight groups.

Figure 1C - Silhouette score for optimal $k$

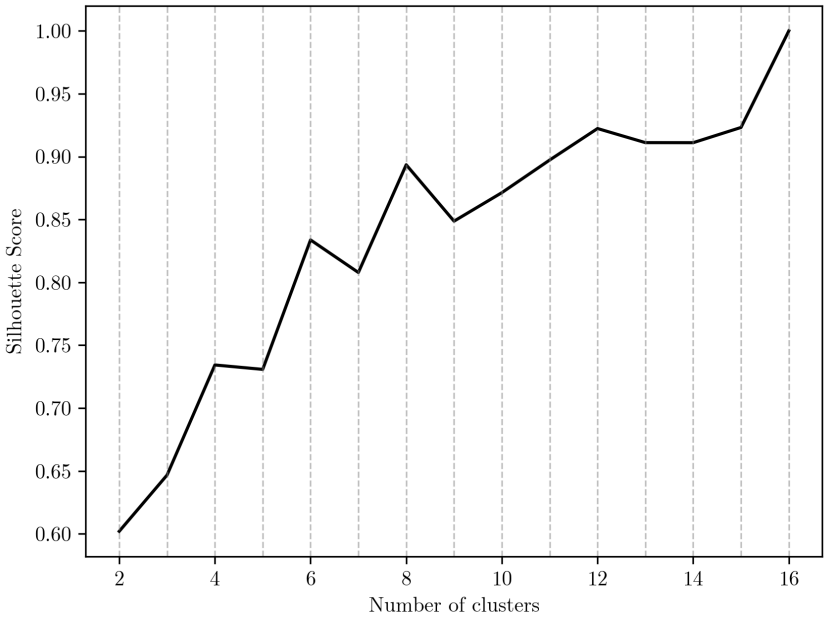
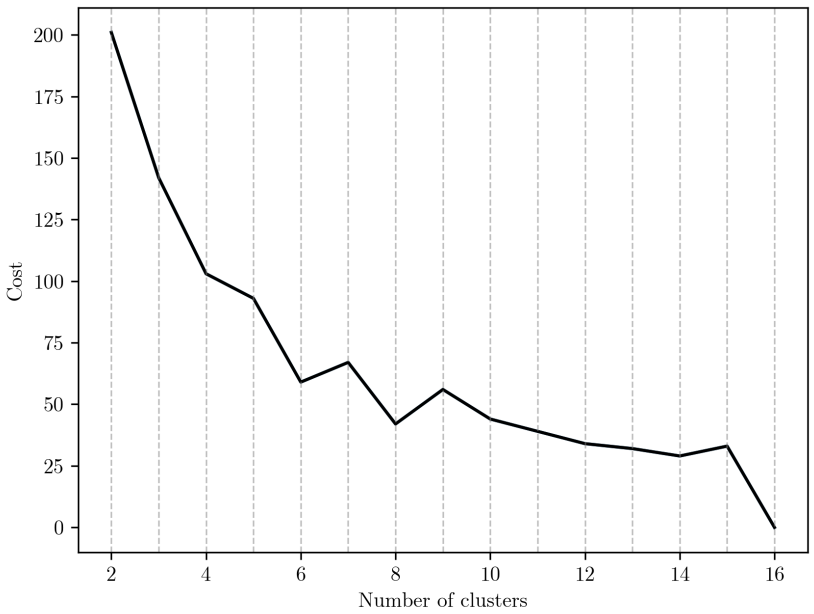



Figure 2C - Cost function for optimal $k$



## Appendix D: General results

Table 1D - Variables averages by cluster

| | Clusters | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Classic | Classic/Modern | Modern | Catholic | 5 | 6 | 7 | Fragile |
| Highest level of education completed | 3.925 | 3.680 | 3.631 | 3.364 | 2.182 | 3.412 | 2.381 | 2.160 |
| Employment (proportion) | 0.486 | 0.479 | 0.506 | 0.357 | 0.444 | 0.531 | 0.446 | 0.489 |
| Informality (proportion) | 0.095 | 0.167 | 0.150 | 0.145 | 0.271 | 0.202 | 0.290 | 0.336 |
| Substandard housing during childhood (years) | 0.804 | 0.520 | 2.369 | 1.182 | 6.091 | 2.471 | 3.571 | 4.960 |
| Substandard housing during adulthood (years) | 0.306 | 0.560 | 0.777 | 0.864 | 4.500 | 1.588 | 1.619 | 1.600 |
| Contraceptives use (proportion) | 0.731 | 0.678 | 0.804 | 0.680 | 0.621 | 0.748 | 0.639 | 0.563 |
| Vulnerability Index | 0.543 | 0.868 | 0.856 | 0.897 | 1.543 | 1.242 | 1.656 | 1.874 |
| Observations | 255 | 25 | 103 | 22 | 22 | 17 | 21 | 25 |
| Fragility Index | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 4 |

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