Childhood neighborhood and the transition to parenthood in Sweden

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Abstract

This thesis is exploring the association between childhood neighborhood and the time of the transition to parenthood. In addition, it also explores the relationship between neighborhood and individual attitudes related to fertility behavior.

For this purpose, two different datasets were combined. The Swedish Housing and Life Course Cohort Study (HOLK) was used to attain longitudinal housing data, as well as individual level attitudes and control variables for the year 2005, from birth cohorts 1964 and 1974. Neighborhood variables for the year 1990 were attained from the research project ResSegr – Residential segregation in five European countries.

By using the same methods as earlier research concerning scalable neighborhoods, five different neighborhood characteristics were identified for parishes in Sweden in 1990; elite, foreign-born, low income, high employment and social assistance. These characteristics were used as independent variables in order to explore any association that might exist between neighborhood at age 16 and the transition to parenthood, using ordinal logistic, logistic and cox proportional models.

The result indicated an association between neighborhood characteristic at age 16 and transition to parenthood. Where growing up in a neighborhood characterized with high income and completed tertiary education causes a delay in the timing of the transition to parenthood. Attitudes were also observed to be affected by neighborhood characteristics from age 16. Indicating neighborhood characteristics having a long-lasting effect of influencing the individuals attitude even 15-25 years later.

Keywords

Neighborhood, Fertility, Parenthood, Attitude, Value, Scalable neighborhood, Segregation, Sweden
Contents

1 Introduction ........................................................................................................... 1
2 Earlier Research .................................................................................................... 4
  2.1 Neighborhood effects from childhood ................................................................. 4
  2.2 Attitude effects on fertility .................................................................................. 6
  2.3 Linking context, attitudes and behavior ................................................................. 8
  2.4 Attitudes toward childbearing in Sweden .............................................................. 11
  2.5 Research on neighborhoods and fertility and its challenges ................................. 12
3 Method .................................................................................................................... 16
  3.1 Data .................................................................................................................... 16
  3.2 Contextual measures ......................................................................................... 17
  3.3 Dependent variables ......................................................................................... 22
  3.4 Family background variables and control variables ............................................ 23
  3.5 Models ............................................................................................................... 24
4 Result ....................................................................................................................... 25
  4.1 Attitudes ............................................................................................................ 25
    4.1.1 Family background, gender and birth cohort effects on attitudes ............... 25
    4.1.2 Neighborhood ............................................................................................... 26
  4.2 Transition to parenthood .................................................................................... 27
    4.2.1 Family background, gender and birth cohort effects on the transition to parenthood .......................................................................... 27
    4.2.2 Neighborhood effects on the transition to parenthood ................................ 28
5 Discussion ............................................................................................................... 31
6 Conclusion ............................................................................................................... 34
7 Acknowledgements ............................................................................................... 36
8 References ............................................................................................................. 37
9 Appendix ............................................................................................................... 42
  9.1 Figure A1 ............................................................................................................ 42
  9.2 Table A1 ............................................................................................................ 43
  9.3 Table A2 ............................................................................................................ 43
  9.4 Table A3 ............................................................................................................ 44
1 Introduction

The fertility question, understood as the probability of a person’s transition to parenthood, is an issue of interest for politicians and central for demographic research.

When it comes to effects from childhood, researchers have been interested in the family background effect, or in other words the intergenerational effect (e.g., Zimmer and Fulton, 1980; Thornton, 1980; McLanahan and Bumpass, 1988; Axinn et al., 1994; Murphy, 1999; Murphy and Wang, 2001; Murphy and Knudsen, 2002; Kolk, 2014).

While the individual characteristics of parents probably have an impact on a person’s choice of becoming a parent or not, studies like that by Anderson and colleagues demonstrate that also the neighborhood impacts people’s decision to become a parent (Andersson et al., 2015). The neighborhood effect can be understood as the spatial variation which exists between two individuals and the impact this variation may have on the individuals behavior (Sampson, 2012, p.44).

There has been a rising interest in the field of demographic on using spatial data. In a recent study by Kolk (2017), spatial data is used to see if the geographical distance between siblings, parents, and grandparents in Sweden changes over time. Hank (2003) uses census areas in Germany to see the effect it has on transition to marriage. Meggiolaro (2011) looks at women’s current residential location in Italy to see if there is an effect on fertility intentions.

When studying effects of your neighborhood on the transition to parenthood with a focus on teenage pregnancy, most studies have studied the effects of living in a socioeconomic disadvantaged neighborhoods. The result of the American studies has, however, not been conclusive in verifying a neighborhood effect related to teenage pregnancy. As in the American studies, teenage pregnancy in Sweden have proven to have weak to non-existent relationship to neighborhood (Hedman, 2014).

It was not until a recent study by Anderson and colleagues that neighborhood was shown to influence overall fertility (that is, not only focusing on teenage pregnancies) (Andersson et al., 2015). The study used a unique way of measuring the neighborhood area called scalable neighborhood. This approach created a so-called neighborhood type individualized neighborhood. These individualized neighborhoods were based on the number of individuals living within an area instead of using administrative boarders. This was done to deal with the scale problem that exist with in the
neighborhood research. The problem being, If the neighborhood is defined by a spatial area which is vast in size it might exclude effects that are found between individuals that lives relatively close to one another (Andersson and Musterd, 2010).

While this new innovative approach tries to deal with the scale problem there still an issue on how neighborhood characteristics from childhood affects fertility behavior. In most studies there is a premade assumption on neighborhood effects. Where growing up in impoverished neighborhood shapes the individual attitudes as an adult, which in turn affects the behavior. Attitudes can be defined as ‘‘the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question’’ (Ajzen 1991, p. 188). When it comes to fertility behavior, there is currently no study in Sweden exploring how this is interlinked with neighborhood characteristics and subsequent attitudes. Overall only one study, by Malmberg and colleagues (2014), can be found on exploring the relationship between neighborhood characteristics and attitudes in Sweden (Malmberg et al.,2014). The study showed that parental motives for choosing schools in Sweden are strongly influenced by the social and ethnic composition of their own and their adjacent neighborhoods (Malmberg et al.,2014). This neighborhood effect on attitudes even showed to be stronger than family background characteristics. While this study does not directly relate to fertility behavior it does show that the neighborhood can cause an effect on individuals attitudes.

By further exploring the relationship between neighborhood characteristics, individual attitudes and fertility behavior, one might better understand how neighborhood ends up affecting demographic behavior. Only focusing on family background characteristics for childhood might give an incomplete understanding for future fertility behavior or what potential policy that needs to be implemented. Therefore, one needs to further explore the effects neighborhood from childhood, otherwise one risk to apply the effects from neighborhood on family background. If certain type of neighborhood types leads to increase the fertility or decrease it, having policy in place to stimulate these types of neighborhoods can be a way of increasing the fertility. One of major challenges for neighborhood effects in Sweden have been able to capture within research. The welfare policy within Sweden can be argued to lead to diminishing effect for neighborhood (Andersson, 2006). Therefore, making use of different neighborhood types and scales might be the way to go in capturing childhood neighborhood effect on the transition to parenthood.

This study than provides the first application of using scalable neighborhood measurement on parish level data for fertility behavior, as Andersson and Colleagues are using geocoded data (Andersson et al., 2015). This study is also the first application of using scalable neighborhood measurement in exploring the relationship between childhood neighborhood and attitudes that have shown to relate to fertility intentions.
In line with this, this study objective is threefold. First, highlight the importance of considering childhood neighborhood characteristics as an important indicator for understanding fertility behavior. If childhood neighborhood impacts fertility behavior, knowing what neighborhood the individual lived in during their childhood could increase our understanding of future fertility behavior. *Childhood neighborhood characteristics* in this study refers to the contextual characteristics in the neighborhood which the individuals lived in at age of 16. *Fertility behavior* in this study refers to the transition to parenthood, which is when the individuals has their first child. Second, providing a conceptual framework researcher can make use of for explaining how neighborhood effect operates. While this is not something new, compared to others researcher (Galster and Killen, 1995; Forste and Tienda, 1996) the framework is based on the Aijzen (1991) planned behavior model, which is a quite common model that is used in demographic research for understanding how fertility intentions affect fertility behavior. Therefore, this might provide a more accessible explanation for people outside of the field in understanding how neighborhood effects operate, especially in regards of attitudes. Third, further extends on the scalable neighborhood method by introducing a variation that can be applicable for dataset that only have access to individual childhood parish. If proven successful one could use this neighborhood measurements when there is a lack of geographical coordinates on the observations.

With this in mind the following research questions were created:

1. What is the association between childhood neighborhood and the transition to parenthood?
2. What is the association between the childhood neighborhood and the individual attitudes in relation to the transition to parenthood?

The first question aims to see if there is a relationship between neighborhood and fertility behavior to begin with. This have previously been explored by Anderson and colleagues (2015), but it is important to see if similar findings can still be found with the variation of the scalable neighborhood measurement being used in this study (Andersson et al., 2015).

This thesis is only exploring the most rudimentary form of the relationship between attitudes and neighborhood. Therefore, the aim of the second research question is examining if there exist a potential connection between people’s attitudes which affect fertility intention and childhood neighborhood characteristics.
2 Earlier Research

2.1 Neighborhood effects from childhood

The current theories on neighborhood effects from childhood are heavily focused on explaining the effect disadvantaged neighborhood conditions during childhood have on the future outcomes (Dietz, 2002; Galster, et al, 2007; Ellen and Turner, 1997). At the moment there is no clear definition on how neighborhood mechanisms are thought to operate. Instead we have multiple different scholars suggesting both similar and different theories on how it functions (Jencks and Mayer, 1990; Sampson et al., 2002; Manski, 1993).

One of the earlier surveys of the theories with in neighborhood field was done by Jencks and Mayer (1990). Their approach has been elaborated and refined, but its theoretical logic remains intact (Ainsworth 2002; Dietz, 2002; Ellen and Turner, 1997). They summarized the different theories existing in the field in to four different general categories. The first category is Contagion theories, where epidemic theory can be considered the purest form of it. In epidemic theory, peer influence as the main factor through which neighborhood effects operates, but the effect will only be realized after a certain threshold is reached within the population (Jencks and Mayer, 1990, p.114-115). For example, there might be a neighborhood where the teenage pregnancy keeps on rising every year and after a while it passes a threshold, which means that the number of teenagers having children are large enough to create a peer influence effect in the neighborhood. The second are theories of Collective socialization, which focuses mainly on the effects the adults in an area may have on the children living there. For example, if many adults in a neighborhood have two children, this fact might send the message that a family should consist of at least two children. In this way children in the area might be influenced to have certain type of attitudes regarding family formation. Social control is another way for adults of influencing children in the area, which comes from having adults present in the area where children interact. The adult's presence works as deterrent from deviant behavior and norm (Ainsworth, 2002). Social networks can also be considered being part of the collective socialization, were children will have access to different social networks depending on where they live. This difference in networks give as a result that children have access to different opportunities, such as help in getting jobs or help with homework (Ainsworth, 2002). The third category are Institutional theories, which mainly focuses on the effects of institutions such as schools and healthcare services can have (Jencks and Mayer, 1990, p.115). For example, the quality of health centers might differ depending on the neighborhood, where health centers in certain neighborhoods hold higher quality than those in other neighborhoods. Therefore, some neighborhoods might have a higher quality of the
information provided from health centers about childbearing and youth sexual behavior. The final theories are those Social Competition theories, which assumes that people with in a neighborhood compete with one another for scarce resources (Jencks and Mayer, 1990). For example, a neighborhood with high amount of teenage pregnancy might make it harder for individuals to get help from institutions as there are multiple people needing that help.

Another commonly used categorization for different ways neighborhood effects function is Manskis (1993) three classifications. The first one is the endogenous effect, which is when an individual’s behavior is based on actions taken by others. This can be considered functioning similar to the peer influence that is seen with in epidemic theory. The second one is contextual effects wherein the exogenous characteristic of the group is the driving factor for influencing behavioral changes. This is similar to effects observed in collective socialization. Third one is correlated effects, were similar behavior arises from individual in a neighborhood sharing similarities in individual characteristics or institutional exposure. This shares similarities with intuitional theory. The difference between these lies in endogenous and contextual effects are considered group effects and are based on human interaction, while correlated effect are more of a non-social phenomenon and lacks human interaction (Manski, 1993).

Looking more specifically in to relationship between neighborhood and attitudes in relation to fertility we can observe factors such as social network being a key element for spreading new ideas for fertility behavior (Lupton and Kneale, 2012). Social network is than see as a way of spreading attitudes changes that have been adopted by the general population, and thereby causing a change. The institutional effect on fertility have also been observed to operate through factors such as teachers’ educational expectations (Kneale, 2010). Forste and Tienda (1996) argues that the determinants for adolescent’s fertility behavior comes from family background, community characteristics, media exposure and biological factors. The effect from biological factors comes in to fruition through sexual behavior. For the other three factor the influence on fertility comes by first affecting adult supervision and role models, which in turn influences the desire, that then affects familial goals and sexual activity which in turn affects the fertility. Like Forste and Tienda (1996) George and colleagues argues that the decision-making process for youth’s fertility behavior are affected by values, aspirations and preferences from the local social network (Galster and Killen, 1995).

In all of these cases attitudes can be viewed as working in conjunction with neighborhood. Where neighborhood effects are operating through attitudes which is also is also the assumption this thesis is based on.
2.2 Attitude effects on fertility

Over the years different theories have been used to understand the driving force behind the transition to parenthood. Compared to the earlier 20th century, parents today can be seen to invest more emotionally in their children (Fawcett, 1988). This in turn makes the psychological benefits of having a child more relevant. Hoffman and Hoffman (1973) list different positive arguments, which causes individuals to desire having children; (1) having a child marks the transition to parenthood; (2) one has a moral obligation to have a child; (3) children are people to love; (4) having a child offers change and stimulation in one’s life; (5) watching a child develop offers a feeling of accomplishment and achievement; (6) parenthood offers the power to influence the child’s life; (7) children can give parents an edge in social comparison; (8) children are a way to live beyond one’s life span (Fawcett, 1988). Fawcett (1988) further expand on this by listing costs and disadvantages of having a child, which also needs to be accounted for; (1) direct economic costs; (2) income-related opportunity costs; (3) opportunity costs other than income; (4) psychological cost; (5) physical costs (Fawcett, 1988). These costs and disadvantages limit the effect these positive desires can have and influence the timing of the childbearing (Fawcett, 1988).

The problem with this type of list is that it suffers from not having an explanation to what would happen if these values would come into conflict with one another (Friedman et al., 1994). Friedman and colleagues thus suggest that one should build on rational choice theory to understand why some individuals have at least one child, while others have none (Friedman et al., 1994). These researchers assume that the rational actors’ main goal will always be to reduce uncertainty. At the same time, individuals in a marriage will aim to increase the solidarity within the marriage.

According to Miller (1994), one can summarize the effect psychological construct have on fertility in to four different steps; (1) the formation of traits; (2) the activation of traits to form desires; (3) the translation of desires into intentions; (4) the implementation of intentions in the form of behavior. Traits can be seen as different tendencies the individual have in behaving, when exposed to certain conditions (Miler, 1994). Desire can be seen as motivations, attitudes, and beliefs the individual bear towards a possible goals or objectives (Miller, 1994). Intentions are the product of the desires the individual hold and indicate someone actual plans towards a behavior. For instance, an individual can have a desire to have a certain number of children but after considering what others desire and what can actually be achieved they might end up with the intention of not having a child.

The theory of planned behavior is a decision-making model for fertility behavior that shares a lot of similarity of the concepts explained by Miller (1994). Especially the distinction between desire and
intention. It is also one of the most common used theories of how values influence fertility behavior (Miller, 1994). According to the theory, the individual's intention towards having children is affected by the expectation your surrounding have on fertility behavior and the values the individual have towards the fertility behavior (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). An individual’s own values towards childbearing, combined with expectations in the individual’s social surrounding will predict intentions and, in turn, subsequent actual behavior (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). Extending on this idea, the theory of planned behavior was then developed (Ajzen, 1991).

The theory of planned behavior, thus, offers a way to understand the interaction that is taking place between intentions and behavior.

To sum up: The factors that influence the intention to have a child can be divided into three distinct categories: (1) attitudes towards the behavior of having a child; (2) subjective norms; (3) perceived behavioral control. Attitudes toward the behavior is the opinion the individual have towards the behavior and not its intention. The subjective norms focus on societal pressure the individual has on them regarding a certain behavior (Ajzen 1991, p. 195). For example, one might see a societal pressure on individuals that first says that it is only appropriate to have children if you are married and secondly that you should have at least have two children. The perceived behavioral control focuses on the difficulties the individuals believe exist if they would decide to go through with the intention of having a child (Ajzen, 1991, p.196). For example, the individual might think that having children could lead them to having difficulties in completing their education, which could persuade the individual not to have children even if he/she has a positive attitude towards having children.

The conclusion is that if you understand both the perceived behavioral control and the intention, it is possible to predict the behavior (Ajzen, 1991, p.184). This means that an attitude will influence a behavior as long as a subjective norm does not override it and if the individual does not see any obstacles to it.

Barber (2001) argues that the aspect of competing attitudes is an external factor in the theory of planned behavior model that should be included. For example, one can observe that women in the USA who held a positive attitude towards career were less inclined to have children (Crimmins et al. 1991; Stolzenberg and Waite, 1977; Waite and Stolzenberg, 1976). Other attitudes such as having enough leisure time or finding the right partner might also end up causing a delay in the transition to parenthood. This leads to the conclusion that it is important to explore competitive attitudes for the individual as that may indirectly influence the intention of having a child.
2.3 Linking context, attitudes and behavior

One of the aims of this thesis was to further explore the relationship between individual attitudes related to fertility and neighborhood effects. Attitudes are often assumed in neighborhood research being one of the ways neighborhood effects are transmitted through (Galster and Killen, 1995; Forste and Tienda, 1996). I will be conceptualizing this relationship with the help of theory of planned behavior (see Figure 1). The planed behavior theory is more commonly used in fertility research for understanding the decision-making process. In using this as a basis, gives a common ground for individuals outside of the neighborhood research field to understand how neighborhood effects may function for fertility behavior. While it’s not shown in this model, family background effects also interact with the factors neighborhood effects are expressed through. This can be seen for instance in Forste and Tienda (1996), where other factors such as family background influence role models and adult supervision.

According to arrow c in Figure 1, the behavior of having a child is affected by the intention the person has towards having a child. This intention is in turn affected by individuals’ attitudes to having a child (see arrow a in Figure 1), individuals’ attitudes toward competing alternative behavior (see arrow g in Figure 1), societies’ subjective norms (see arrow b in Figure 1) and the individuals’ perceived behavioral control (see arrow d in Figure 1). This means that having a strong attitude in favor of having children might not actually lead to the behavior itself, as the intention is also affected by other factors.
Figure 1. Theoretical model on neighborhood effects through attitude on the transition to parenthood. An adaptation of Barber’s (2001) interpretation of Ajzen’s (1988) planned behavior model.
The first research question aims to see if there exists an effect from the childhood neighborhood on the transition to parenthood. If no association exists between neighborhood variables and transition to parenthood, including neighborhood in the theoretical model becomes redundant. At the same time, an association between neighborhood and the transition to parenthood does not necessarily mean that an observed effect only has its origin in the individual’s intention. This means that there can be an effect from the neighborhood which does not relate to the intention of the persons directly involved in the decision of having a child or not. This can be observed in Figure 1 through arrow k, which indicates the direct effect the neighborhood may have on the transition to parenthood, that is, the effect cannot be explained by attitudes regarding having children, or through subjective or perceived behavioral control.

The second research question aims to examine if there is a connection between individuals’ attitudes and neighborhood characteristics. In Figure 1, arrows i and j signifies the relationship that is to be explored between individuals’ attitudes and neighborhood characteristics such as the composition in terms of education, family forms, employment, and equivalent. It is through these two arrows the neighborhood theories are expected to affect individuals’ attitudes towards having children.

One important aspect to note is that neighborhood is seen to influence the transition to parenthood through the intention of having children. This intention of having children is what is assumed neighborhood is influencing indirectly. This can be observed in Figure 1, were neighborhood is influencing attitudes through arrows i and j, which in turn affects the intention of having children through arrow g and a, which end up affecting the fertility behavior through arrow c. The attitudes regarding competing behavior also play a significant role. For example, an individual can have a strong attitude in favor of having children, but because they believe they need a job first it might cause them to delay the transition into parenthood. The competing attitudes then affects attitudes towards childbearing as seen in arrow f in Figure 1 and hence affects the intention itself also through arrow g.

In the end, to be able to predict future fertility behavior well, one would need to account for the social norms and perceived behavior control that exist, as seen in figure 1. By doing so, one can predict the actual intention towards the behavior. The practical problem here is that attitudes towards having children, subjective norms and perceived behavioral control also interacts with one another. Therefore, to be able to determine the neighborhood effect expressed through attitudes, would also need to account for the effects neighborhood can have through social norms, perceived behavioral control and other unaccounted effects (see arrow k in Figure 1).
2.4 Attitudes toward childbearing in Sweden

In 2009 a report was published by SCB (2009:2) that explored men and women’s attitudes towards childbearing. The report contains the view of 7000 women from age 20-40 and men from age 20-44 that were childless in the end of 2008 or hade their first or second child during 2006 (SCB, 2009:2). The findings showed that most individuals that was childless still wanted to have children in the future and those that already hade child did not want any more than two children (SCB, 2009:2). At the same time research have also found that in addition of Swedes having a strong two-child norm there is a strong preference of having at least one girl and boy, indicated by the fact that mothers of two same-sex children are more likely than mothers of two mixed-sex children to have a third child (Andersson et al, 2006).

Research has thus demonstrated a strong two-child norm existing in Sweden accompanied by a strong gender preference of having one child of each sex. Despite this, there is still an impact from attitudes which can cause a delay in the transition to parenthood. The report by SCB (2009:2) also showed both men and women in Sweden expressing the importance of experiencing other parts of life before having a child. For young Swedish men one of the major concerns was the restriction of personal freedom that comes with having a child (Bergnéhr and Bernhardt, 2011). Female postgraduate students expressed that they are content with having their first child around the age of 31, which is later than the general population (Skoog Svanberg et al., 2006). Despite this delay, they still want to have two to three children (Skoog Svanberg et al., 2006).

One of the most common factors interfering with individuals’ fertility desire in Europe is the problem of finding the right partner for raising children (Testa, 2007). The same is true for Sweden, where both men and women express a desire to finding the right partner before having a child (SCB, 2009:2). But even if they found the right partner, the relationship dynamic itself plays a key role in the decision of having a child or not. For example, in egalitarian couples, the man’s enthusiasm towards having child and his comfort of sharing the burden of bringing up a child is the driving force for the couple’s transition to parenthood. While the transition to parenthood of a traditional couple will rely more on the woman’s idea of the potential benefits of having a child (Bernhardt and Goldscheider, 2006).
2.5 Research on neighborhoods and fertility and its challenges

2.5.1 Childhood neighborhoods and fertility in USA

One of the more impactful studies in the later 20th century on neighborhood was done by Wilson (1987). Wilson argues that individuals growing up in poor neighborhoods such as inner-city ghettos are exposed to different neighborhood characteristics, which leads them to be less likely to seek education or employment, and more likely to experience teenage pregnancy. This has led to a lot of the research in USA having a strong emphasizes on understanding the effect of growing up in a poor neighborhood (having dwindling number of individuals that are employed, educated and high-income earners) to non-poor neighborhood. Making teenage pregnancy one of the major topics of interest.

Individuals that have grown up in poor neighborhood in USA have been observed to have a higher chance of experience teenage pregnancy and nonmartial childbearing compared to those not from a poor neighborhood (Hoga and Kitigawa, 1985; Wilson, 1996; Forste and Tienda, 1996; South and Crowder, 1999; Ginther, Haveman, Wolfe, 2000; Harding, 2003; Galster, et al., 2007; South, and Crowder 2010; Wodkte, 2013;). This effect seems to be more prominent and increase the longer the individual stays in the neighborhood (Wodkte, 2013). The effect also seems to increase if the poor neighborhoods are surrounded by economically advantaged neighborhoods, indicating a spillover effect from neighborhoods (South and Crowder, 2010). Neighborhood effect have also shown to vary in strength depending on individuals racial or ethnic background (Forste and Maria, 1996).

2.5.2 Selection bias and omitted individual and family characteristics

While research in USA indicates neighborhood effect on fertility, one does not know fully if it’s coming from neighborhood. When other variables such as family characteristic are controlled for, neighborhood effect tends to diminish, making it unclear if the effect is coming from neighborhood (Galster et al., 2007; Ginther et al., 2000; Thornberry et al., 1997). This can be a product of factor such as selection bias or omitted individual and family characteristic, which may cause an overestimation on neighborhood effects (Dietz, 2002; Ellen and Tuner, 1997; Sampson et al., 2002).

Unobserved family characteristics is a common problem in neighborhood research. For example, while education and income of parents might give some information on family characteristics it does not fully cover the effect that comes from families (Dietz, 2002). Using fixed effect models with siblings would help to deal with this problem of not accounting for family characteristics. Selection bias can be considered one of the biggest challenges neighborhood-level research has today (Sampson et al., 2002; Galster et al., 2007; Hedman, 2014). The problems lie in
determining if the effect observed from neighborhood is actually form neighborhood or product of certain type of individuals being drawn to living in different type of areas. For example, a teenager that ends up having child within high teenage pregnancy neighborhood would attribute the effect to neighborhood. Individuals are not randomly placed between different neighborhoods. They have different preferences and circumstances influencing their decision on where to live. Let's say the real reason for teenager having a child in this case, is the lack of use of contraceptive. This comes from the teenager having strong religious belief with is also shared by the parents. It is also because of their religious belief they decided to move to this neighborhood, as it allowed them to live closer to their church. As such, the effect comes from religion, which leads the teenager being present within a high teenage pregnancy neighborhood and the reason for it having child. Using models such as fixed effect on siblings, random effect models or instrumental variable techniques (IV), would lessen the effect of selection bias (Dietz, 2002; Hedman, 2014).

Most neighborhood studies don’t account for selection bias or control fully for the family characteristics, as such one should be cautious when interpreting the strength of the neighborhood effect in such studies (Ellen and Tuner, 1997; Sampson et al., 2002). The mixed result can product of not controlling for omitted family background characteristics and selection bias (Hedman, 2014).

2.5.3 Neighborhoods and fertility in Western European countries

With the mixed results found in the USA, finding neighborhood effects from childhood on fertility in European countries can prove to be even more problematic. The European countries have policies in place negating potential effects from growing up in a socioeconomic disadvantaged neighborhoods (Friedrichs et al., 2010). Even if neighborhood effects are observed for fertility, fertility is normally better explained by the individual and household characteristics (McCulloch, 2001; Meggiolaro, 2011; Hedman, 2014). Compared to Western European countries, USA also have an overall higher amount of the population experiencing teenage pregnancy (Danielsson et al., 2001). According to Danielsson and colleagues, countries such as Sweden, UK and France have easier access to contraceptives and other reproductive health services than USA, which leads to lower rate of teenage pregnancy (Danielsson et al., 2001).

Still neighborhood effects have been observed in UK. For example, Ermish and Pevalin (2003) measured the labor market effects by using travel-to-work-area (TTWA). The result indicates that individuals in TTWA areas with high employment rates are more likely to have a child in the coming year. In another study Lupton and Kneale (2012) the TTWA was observed to have no effect on teenage pregnancy. There are some differences in the structure of both these studies but Lupton and Kneale (2012) argues that the effect observed in Ermish and Pevalin (2003) can be a product of using
a limited set of controls. When using electoral ward for neighborhood area, Lupton and Kneale (2012) result indicated effects coming from neighborhood on teenage pregnancy. Young woman that grew up in wards with high proportion of social workers, high amount young married people or low educated people were more likely to experience teenage pregnancy. Lupton and Kneale (20012) argues that the effect was relative weak and as selection bias was not accounted for there is a risk of the estimates being inflated, making the results questionable (Lupton and Kneale, 2012).

Hedman (2014) is one of the few studies that have been done on neighborhood effect on fertility. For this study the neighborhood area was defined using SAMS (Small Area Market Statistics) areas. To reduce the selection bias, Hedman (2014) made use of random effect model with Mundlak (1978) correction and compares it to an OLS model, which does not control selection bias. The OLS model reported very small effect on individuals that resided in areas with high teenage pregnancy from the year 16-20. When using the random effects model with a Mundlak correction the effect was even less making it basically non-existent.

2.5.4 Scale dependency within Neighborhoods

A central aspect in neighborhood research is the geographical size of the neighborhood and its boarders. In the literature, Census geography, tracts or higher geographical aggregations have been used to define the size and boarders of the neighborhood (Sampson et al, 2002). This means that neighborhood effect is usually analyzed at bigger scales, forgoing effects that might exist on smaller scales (Sampson et al, 2002). There are multiple ways constructing neighborhood area, and instead one should let the explanatory variables of interest decide the size rather than letting the data being the constricting factor (Nakaya, 2000). Otherwise the lack of observation of neighborhood effect can be product of having incorrect size and borders. For example, according to Andersson and Mustard (2010) “It is reasonable to assume that if endogenous neighborhood effects are in operation, such effects would be greater in the immediate surroundings of an individual and they would decrease as the size of the unit increases” (p.28). In measuring different scales, the possibility of observing neighborhood effects with in the data increases (Andersson and Mustard, 2010)

In contrast to previous studies on neighborhood effect on fertility, Anderson and colleagues made use of the so called ”scalable neighborhood measurement” (Andersson et al., 2015). The neighborhoods, in this case, are self-created and use the proximity between individuals as the delimitating factor of the neighborhood-border. In this way the neighborhoods that are created are formed by individuals living a set distance from one another. In this way the neighborhoods that are created are formed by individuals living a set distance from one another.
They were able to identify different neighborhood types, such as “Elite area”, defined as neighborhoods that had a high proportion of individuals with completed tertiary education and who belonged to the highest income decile. In Anderson and colleagues’ study, living in an “Elite area” or an area with a high proportion of foreign-born population caused a slower transition to parenthood, even after controlling for individual level characteristics (Andersson et al., 2015).

The use of the scalable neighborhood measurement could be one of the reasons why such an effect could be observed. For example, in Sweden the scalable neighborhood measurement has shown to be three times better than using Small Area Market Statistics (SAMS) areas for measuring contextual effects on educational attainment (Andersson and Malmberg, 2015). In addition, scalable neighborhood has also shown evidence of being effective for school choice attitudes and employment (Musterd and Andersson, 2006; Malmberg et al., 2014). This makes it evident that using scalable neighborhood measurement for neighborhood studies in Sweden have been quite effective.

2.5.5 Neighbourhood and competitive attitudes

For attitudes, I earlier acknowledged the importance of also exploring competing attitudes to childbearing. In line with this, it is essential to understand neighborhood research that focus on other outcomes than having a child. For example, children growing up in poor neighborhoods could be expected to have children earlier as they are less likely to pursue education. For instance, growing up in a poor neighborhood in the USA mostly have shown to lower the aspiration for education and increase the dropout rate at high school (Datcher, 1982; Ainsworth, 2002). Individuals coming from socioeconomic deprived areas have also shown to have less income in the future and a higher unemployment rate (Vartanian, 1999; Chetty and Hendren, 2016). In Sweden, growing up in neighborhood from age 14-16 with a high number of individuals with university degrees, increases the likelihood of having more completed years of education 10 years later, while a high number of blue-collar workers have the opposite effect (Andersson and Subramanian, 2006). The family background has however been shown to have stronger effect than the neighborhood when it comes to educational attainment (Lindahl, 2011). As for employment, there are indications that individuals living in areas with higher unemployment are more likely to stay unemployed longer (Musterd and Andersson, 2006). For income, no strong indication has been found that living in the same neighborhood from age 15-20 would influence a person’s future income (Andersson, 2004).
3 Method

3.1 Data

The data that is used for this study is the Swedish Housing and Life Course Cohort Study (HOLK). HOLK is a combination of survey and register data and was designed to study the relationship between housing and childbearing. It follows individuals from three different birth cohorts; 1956, 1964 and 1974. The survey was conducted during spring 2005 and has been updated with register data, with a response rate of 60% the data consist of 2242 observation (Ström, 2012).

HOLK includes time varying information about parish of residence. However, as will be discussed in more detail below, and as seen in Figure 2, the contextual variables linked to the parishes are constructed based on data from the year 1990 from another database. For the 1974 cohort, this corresponds perfectly to the year childhood parish is measured, and for the 1964 cohort, the contextual variables are constructed 10 years later, which is reasonable as neighborhoods generally do not change very quickly. However, for the 1956 cohort, the discrepancy is 18 years, which is on the verge of what could be considered reasonable. Therefore, the individuals born in 1956 were removed, reducing the sample to 1460 observations.

One of the main benefits of this dataset is the information it provides on the individuals’ housing history. While earlier studies have made use of the housing history data HOLK provides (Öst, 2012; Ström, 2010), none have yet applied the information on the residential information from the individuals’ childhoods.

![Figure 2. Overview on time periods the data have been taken and the ages of the cohort](image-url)
3.2 Contextual measures

This thesis also provides another dimension to the HOLK dataset, by combing it with contextual measurements derived from the ResSegr - Residential segregation in five European countries research project (Residential segregation in Europe, 2018). The ResSegr is an ongoing collaboration between 5 countries to produce a database for measuring residential segregation through individualized neighborhood. This thesis is making use of the Swedish part of the data. The data consist of 13 different indicators measured at nine different scale levels. It uses a Systems (GIS)-based approach for creating neighborhoods. This means that neighborhoods are created from the number of individuals living in a certain area instead of administrative borders. This is done by using data from the GeoStar (2015). The process involves setting a threshold value on the number of individuals you want in an area. For example, if you want education as a key variable to be measured on a scale of 800 people; the 800 nearest neighbors around an individual are defined and the number of individuals that completed a tertiary education of those 80 are reported.

As the data base still is a work in progress, which means that even if the ResSegr data base includes 9 scale measurement, additional scales are still available for Sweden. For this thesis I am using all the 14 different scales that are available with the following number of inhabitants:
50,100,200,400,800,1600,3200,6400,12800,25600,51200,102400,204800 and 409600.

As for the indicators 6 different indicators was picked from the ResSegr database.

(1) The first one is the share of individuals with low income and poverty. This was measured including all individuals above age 25 with a disposable income and examining how many had a disposable income below 60 % of the national median.

(2) The second measure was the share of foreign-born in the population.

(3) The third measure was the share of individuals with a tertiary education. This was measured by using the levels 5 and 6 from the ISCED code of 1997 (Nielsen et al., 2017).

(4) The forth measure was the share of individuals with high income. This measure is constructed by ranking all 25- to 64-year-old by their taxable earned income and grouping them into deciles. Individuals who are in the highest income decile are labeled as high-income earners.

(5) The fifth measure is the share of individuals with social assistance. This was defined as the share of all individuals aged 18 to 64 that had received social assistance support by the government at least once during 1990.

(6) The sixth measure captures share of individuals in employment. Here the ILO definition (Nielsen et al., 2017) is used to decide if an individual is employed or not. Individuals between ages 25 and 64 who worked more than one day or were self-employed in 1990 were labeled as employed.
The ResSegr database in its current form requires geographical coordinates for the observations. As the HOLK data only gives us information on parishes, further transformation on the individualized neighborhood from ResSegr data was needed. To be able to perform the transformation, additional information was needed for every parish’s administrative border around years 1980 and 1990. I was, however, not able to attain this data and instead had to use the parish border information for the years 1955 and 2008. This means that some of the parish code that is found in the HOLK dataset could not be identified, which means that a parish registered for a person when he/she was 16 years might have been removed or not existing. Because of this, 96 observations were excluded, reducing the sample to 1366 observations. In addition, individuals that had missing data or responded don’t know for the attitude questions in the HOLK data was removed. This led to a data sample of 1288 observation.

The transformation process consisted of placing the individual neighborhoods within administrative borders of a parish and the calculating the average for each corresponding indicator. For example, if you look at figure 3 you see the parish Munkfors (grey area in Figure 4). The red dots on top of Munkfors are the individual neighborhoods formed from the ResSegr data. For each increase in scale there would be fewer red dots with in the area, as more people are included. Each indicator from the ResSegr data is then calculated with in the individual neighborhood. All indicator values from individual neighborhoods that are within the border of Munkfors are then summarized. The average is then calculated for each indicator and represent the value for Munkfors. This was repeated then for all 6 indicators for all scales, creating 84 different contextual indicators.

![Image](image.png)

**Figure 3.** Individual neighborhood on top of the parish Munkfors. Grey area is the is Munkfors while the red dots are individual neighborhoods.

The number of contextual indicators needed to be reduced, as 84 variables are too many variables to include in a model. This study follows the same procedures as Anderson and colleagues (2015) and reduces the number of contextual indicators by using a principal component analysis (PCA) followed by a varimax rotation (Andersson et al., 2015). To find the best fitted factor model a scree plot of the eigenvalues was used to identify a natural bend or break point in the data (Costello and Osborne, 2005). This resulted in a five-factor solution. The five-factor solution showed that the factors were
mostly influenced by the scales 50 to 12800, while the higher scale showed a steady decline in their loadings (see figure A1 in Appendix). Based on this the decision was made only to retain the scales of 50, 100, 200, 400, 800, 1600, 3200, 6400, 12800. A principal component analysis (PCA) followed by a varimax rotation was then performed for the 54 remaining contextual indicators. The final factor model contains five factors capturing 86.73% of the original covariation (see Figure 4). Regression-based factor scores were then generated for each parish. The regression-based factor scores are standardized scores (Distefano et al., 2009).

Overall the factor model helped to identify five distinctive parish types for Sweden at 1990, (see Figure 5):

- Elite (factor 1): The first factor described areas that have a lot of individuals that are in the highest income decile and have completed tertiary education. Weak positive loadings are also observed for immigrant and employment, while a weak negative loading can be observed for low income (see Figure 5).
- Foreign-born (factor 2): The second factor is heavily characterized by foreign born individuals. Some weak positive loadings were also observed for Social assistance and Income in the highest decile (see Figure 5).
- Low income (factor 3): The third factor captures areas with a high number of individuals with low income. Weaker negative factor loadings are also observed for foreign born and being in the highest income decile. While the negative factor loading for highest income decile can be expected since it is a low-income area. The negative foreign-born loading indicates that these low-income areas might be low income areas with a majority of native-born population (see Figure 5).
- Employment (factor 4): The fourth factor is characterized by high employment. Weaker negative factor loadings are also observed on social assistance and low disposable income, while income in the highest decile show a weak positive factor loading (see Figure 5).
- Social assistance (factor 5): The fifth factor is heavily characterized by High number of individuals with social assistance. Weaker positive loadings can also be seen on the immigrant and weak negative loadings on employment and income in the highest decile. This indicates that these areas with high social assistance also contain more foreign-born individuals with the addition of having lower number of individuals that are employed and belongs to the high-income decile (see Figure 5).
By using PCA with a varimax rotation, we can reduce the observation data and creating neighborhood types with scale dependency. It also allows the use of heavily correlated indicators reducing potential multicollinearity between the neighborhood indicators (Andersson et al., 2015). Indicators such as high income and education are not independent from one another, by having factor such as Elite area instead of only having education or income we allow for the other indicators to also show their influence conjunction with these two. It is also important to remember this process is not identify all neighborhoods types in Sweden, as there is a limitation in the number of indicators which are available to be used. Other indicators can be of relevance when observing neighborhood related to fertility.

Figure 4. Scree plot of the eigenvalues for the final factor model and factors variance. Eigenvalues on the y-axis and component numbers on the x-axis.
Figure 5. Factor loadings at different scales. Loadings on the y-axis and k number of closest neighbors on the x-axis.
3.3 Dependent variables

**Attitudes**

The dependent variable for the first research question uses the attitude variables found in the HOLK data set. The individuals were asked the following question: People have different opinions on what is important in life. Please grade how important you find the following areas of life. Each question could be answered on a scale of 1-5, were 1 was unimportant and 5 very important. Individuals were also given the opportunity to answer, “don’t know”. Six questions were selected to represent the individual’s attitude: (1) To be successful in your occupation; (2) To do well financially; (3) To have a good education; (4) To live in a good couple relation; (5) To have children; (6) To have a lot of time for leisure, e.g. sports and hobbies. These questions were selected based on the information gained from SCB (2009:2) report and earlier neighborhood research which indicated that they are likely to influence fertility behavior.

The answers on the attitude scales center around the values 4-5, indicating a positive bias in the sample (see Table 1). On all the attitude questions, the values of 1-2 have few answers. Consequently, the 1 and 2 have been combined, transforming all the attitude variables to a four-point scale, with the following meaning: 1 unimportant, 2 neutral, 3 important and 4 very important (see Table 1).

**Transition to parenthood**

The other dependent variable is the transition to parenthood. An individual will be considered a parent if he/she has at least one child. If a person has no child, he/she is considered a non-parent. For both men and women, the propensity of having a child will start being observed at the age of 16 until the data collection year for HOLK, which is 2005. This means that the 1974 cohort is observed from age 16-31 and 1964 cohort from age 16-41.

The majority of the 1964 cohort have already transitioned to parenthood in 2005, whereas the members of the 1974 cohort are evenly distributed between the positions of having and not having children (see Table 1). This means that the majority of the individuals that have not yet transitioned to parenthood are from the 1974 cohort.
Table 1. Descriptive data on the dependent variables (%)

<table>
<thead>
<tr>
<th>Scale 1-5 were 1 is unimportant and 5 is very important</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of being successful in your occupation</td>
<td>2.11</td>
<td>4.84</td>
<td>30.37</td>
<td>44.73</td>
<td>17.95</td>
</tr>
<tr>
<td>Importance to do well financially</td>
<td>0</td>
<td>0.94</td>
<td>10.77</td>
<td>45.90</td>
<td>42.39</td>
</tr>
<tr>
<td>Importance of good education</td>
<td>2.19</td>
<td>7.49</td>
<td>30.91</td>
<td>39.97</td>
<td>19.44</td>
</tr>
<tr>
<td>Importance of good couple's relationship</td>
<td>1.01</td>
<td>2.19</td>
<td>6.79</td>
<td>19.44</td>
<td>70.57</td>
</tr>
<tr>
<td>Importance of having children</td>
<td>3.43</td>
<td>3.67</td>
<td>11.48</td>
<td>24.91</td>
<td>56.52</td>
</tr>
<tr>
<td>Importance of having time for leisure, sports and hobbies</td>
<td>0.94</td>
<td>4.84</td>
<td>22.64</td>
<td>37.70</td>
<td>33.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transition to parenthood per birth cohort</th>
<th>1964</th>
<th>1974</th>
<th>Entire sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have transitioned to parenthood</td>
<td>85.71</td>
<td>49.26</td>
<td>66.59</td>
</tr>
<tr>
<td>Have not transitioned to parenthood</td>
<td>14.29</td>
<td>50.74</td>
<td>33.41</td>
</tr>
</tbody>
</table>

3.4 Family background variables and control variables

Family background variables

To account for the influence from family background on the transition to parenthood, 3 indicators of parental background were included. These are: The household’s disposable income when the individual was 16, Single mother household and Parents’ occupational background.

(1) The household’s disposable income when the individual was 16 years tells us how much disposable income the parents had during that time.

(2) The occupational variable is measured by asking the respondent what type of occupation their parent had when the individual was 16 years. The occupational status in then classified by the Swedish socio-economic classification (SEI), by Statistics Sweden. The parent with the highest SEI is used for the analysis.

(3) The single parent household variable is measured by asking the respondent if they grew up with both or one of their parents. Everyone that did not grow up with a single parent is coded as other. Of the 124 people that grew up in a single parent household, only 8 grew up with a single father. The variable mostly reflects growing up with a single mother. More descriptive information can be found in Table A1 in appendix.

Control variables

The control variables are: gender, birth cohort, education and disposable income.

(1) Gender. While gender is being used as a variable in the analysis, for analyses on fertility it would have been desirable to estimate two different models to account for different patterns for
women and men. Here, this would however reduce the sample size too much and therefore a
gender dummy is used to absorb any differences that would exist because of gender.

(2) Birth cohort. Like gender, different models can be developed for the birth cohort variable as
the data set only contains two birth cohorts. As this would also reduce the sample size in a similar
way as gender, a birth cohort dummy is used instead to account for any differences that stems from
belonging to a different birth cohort.

(3) Education. The education variable is coded by three-digit SUN 2000 codes. Only 8
observations were observed for postgraduate education. Instead of removing these, they were
added to the category ”post-secondary education”, two years or longer. Primary and lower
secondary education will be the reference category when education is used.

(4) Disposable income. As for disposable income one extreme observation was observed and
removed. The individual’s education and income will only be used in model 10 in Table 6, as the
main purpose of these is to see if the final result still holds even when these variables are present.
More descriptive information can be found in Table A2, in the appendix.

3.5 Models

Nine different models are being used to explore the relationship between neighborhood
characteristics, attitudes and the transition to parenthood.

Models 1 through 6 in Table 2 explores the relationship between neighborhood characteristics and
attitudes. All models in Table 2 have attitudes as the dependent variables, which are of ordinal
character. When the dependent variable is of ordinal character, one can make use of models such as
multinomial, ordered logit or generalized order logit (Fullerton, 2009). Compared to multinomial
models the ordered logit and generalized ordered logit models, make use of the information contained
in the ordering (Fullerton, 2009). The ordered logit model requires the researcher to fulfill the
proportional odds assumption, otherwise one would end up with biased estimates (Fullerton, 2009).
This assumption entitles that an individual variable should have the same proportional increase or
decline compared to its counterpart, making the intercept the only coefficient which does not stay the
same (Fullerton, 2009). One can make use of the Brant test to control for this assumption (Brant,
1990). When the proportional assumption does not hold one can instead use generalized ordinal
models or multinomial models (Fullerton, 2009). As none of the models in this study failed the Brant
test, there was no need to use any other type of model. All these models are interpreted from odds
ratio. The odds ratio indicates the likelihood of something occurring when compared to the base line
category. For example, for gender the baseline is man, so if woman has a value higher than 1, this
means that women have a higher likelihood of experience it than men, while a lower value than means
the opposite.
Models 7 and 8 in Table 3 uses the transition to parenthood as the dependent variable for examining fertility outcomes. Both models examine if there exist a relationship between neighborhood characteristics and fertility. Model 7 describes results from a logistic regression while Model 8 contains results from a Cox proportional hazard model (Blossfeld et al., 2007). The difference between the two is that the logistic model measures the likelihood of having a child before the age of 31 or 41 respectively, while the Cox model takes into consideration the entire time duration until the individual experience of having a child. Because of this the word risk is used when discussing cox proportional model as the variables hazard rates express the risk over time for the individual to experience transition to parenthood. In addition, a ninth logistic model is added to see if the effect observed in Model 7 stays consistent when education and income is added. The same can’t not be done for the cox model. As it requires the information about the timing of other time varying events, so that the correct exposure can be distributed, otherwise you end up doing an anticipatory analysis, leading to having biased results. Both education and the income variable have a lot missing observation over time. This also makes it less suitable in studying factors such as attitudes if one can’t pinpoint the timing when attitude was attained.

Normally the Cox proportional model is also used when the baseline hazard is unknown, which is not the case for the chance of having a first child, which is known to increase in younger persons and steadily decline after a certain age. Despite this, a Cox model is still used in this study in order to be consistent with the previous study done by Andersson and colleagues on the effect of individualized neighborhood on the timing of fertility (Andersson et al., 2015).

4 Result

4.1 Attitudes

4.1.1 Family background, gender and birth cohort effects on attitudes

The first step is to examine how neighborhood characteristics are associated with attitudes. Starting with the control variables, women are more likely than men to value having a good education, do well financially, having children and being in good couple relation, while men are more likely to value the importance of being successful in their occupation (see Models 1 through 5 in Table 2). The biggest difference can be observed in the importance of having children, were women are more likely to value it higher than men. For the birth cohorts, the only significant result was observed for the importance
of leisure time, sport and hobbies, where the 1974 cohort are less likely than the 1964 cohort to value it highly (see Model 6 in Table 2).

The importance of parental background can mainly be seen in attitudes regarding the importance of having a good education and being successful in your occupation (see Models 1 and 2 in Table 2). Individuals who grew up in families were the highest employment of the parent are Intermediate non-manual employment or Professional non-manual employment, have odd ratio around 1.5, indicating a higher likelihood to value education higher compared to those with parents described as Unskilled (employment). As for occupation, the individuals who grew up in families where the highest employment of the parents was Professional non-manual employment, have an odds ratio around 1.5, indicating a higher likelihood to value occupational higher than those that grew up with Unskilled parents.

4.1.2 Neighborhood

For the attitudes, three of the six attitudes appear to be affected by neighborhood context, namely attitudes regarding the importance of education, children and leisure time (Models 1, 5 and 6 in Table 2).

For the sake of interpretation, the contextual factors have been standardized. Standardized scores use a reference point, which in this case in the average value for all the parishes in 1990 for the corresponding indicator. This reference point is set as the value 0. Having a higher or lower value than 0 indicates how much the neighborhood differs from the average. Hence a positive value means that the neighborhood share of individuals for that indicator is higher than the average, while negative values means the opposite. From here on the word baseline value will be used to describe the average value for all the parishes in 1990. All the models that have the neighborhood variable in them shows the effect of individuals that lived in neighborhoods with a standard deviation of 1. Depending on what neighborhood the individual grew up in the effect of the neighborhood variables will change.

For example, if an individual grows up in an area characterized by an elite factor of one standard deviation higher than the mean, this increases the odds ratio of valuing education highly with 9 % compared to that of an individual from a parish with an average level of elite composition (Table 2, Model 1), and decreases the odds ratio of valuing children highly by 7 % (Table 2, Model 5).

Overall, growing up in areas characterized by elite composition increases the likelihood of valuing education higher and decrease in likelihood to value having children higher. While these effects might seem quite small, one needs to remember the value only shows the effect for neighborhoods with an elite factor of 1 standard deviation from the mean. Neighborhoods that for instance have a value of 6.5 (which is the highest value in the dataset for elite factor) will increase the odds ratio for a positive
view of education with 77% when compared to the bassline. While the odds ratio for a positive view on having children decreases 62% when compared to the bassline. Note, however that those observation are quite few as 6.5 is quite high standard deviation, therefore most observation will be within 1 standard deviation effect. The important aspect here is that the odds ratio is not the same for all neighborhood. Also, there exist extreme observation were the effect is a lot stronger compared to other neighborhoods.

Growing up in an area characterized by many foreign-born neighbors is associated with assigning higher value to education, and the same is the case for growing up in elite areas. A negative effect is observed on attitudes to the importance of education from growing up in a parish characterized by high employment but average levels of education (Table 2, Model 1). This means that the importance of education increases for individuals growing up in areas characterized by a high proportion of tertiary educated, high-earners and foreign-born, while residing in areas characterized by a high proportion of employed individuals (although they do not have an exceptionally high education) lowers it.

As observed in the example, the importance of having a child is lower among individuals who grew up in areas characterized by a high proportion of tertiary educated and high-earners.

Attitudes regarding the importance of leisure time indicates that a higher proportion of foreign-born in the area might lead to an increase in the importance of this factor. At the same time the model’s chi2 is not significant, indicating that the model itself might not properly describe the connection.

One important implication of the found patterns is that they indicate long-lasting effects from neighborhoods on how individuals value education and children. The neighborhood effect was measured at the age of 16 whereas the attitudes are measured at age of 31 or 41. Despite of this 15-25 years gap from their childhood neighborhood, an effect can still be observed on their attitudes.

In the next step I will examine the effect neighborhood characteristics have on the transition to parenthood and see if similar result can be found as in Andersson and colleagues’ study (Andersson et al., 2015) (Table 3).

### 4.2 Transition to parenthood

#### 4.2.1 Family background, gender and birth cohort effects on the transition to parenthood

Table 3 contains first a logistic model (Model 7) that measures the likelihood for the individual to have children before age 31 or 41, depending on the cohort. The other model (Model 8) is a cox
proportional hazard model that measures the risk for the individual to experience the event to having a child.

Starting with the control variables, we see that women have almost twice the *likelihood* to have a child compared to men (Table 3, Model 7). In this regard Model 8 also shows that women have an increased propensity of having a child than men, when taking exposure over time into account.

As for cohort effects, the 1964 cohort has much higher likelihood to have children than the 1974 cohort (Table 3, Model 7). The 1964 cohort consists of individuals that are aged 41 in 2005. Therefore, one might think that the difference is the result of these individuals having had more time to have children. Model 8 in Table 3 shows that the 1974 cohort have a lower chance of transitioning at the younger ages compared to the 1964 cohort even when the time under risk is adjusted for. Even if we only examine the time until age 31 for both cohorts (Figure 6) it can be observed that 1974 cohort have children slightly later.

None of the family background variables are found to be significant.

4.2.2 Neighborhood effects on the transition to parenthood

The result from the cox model (see Table 3, Model 8) indicates that the more heavily a neighborhood was characterized by an elite factor, the lower the propensity was in experience a transition to parenthood. The logistic model (See Table 3, model 7) shows similar results as model 8. Individual’s lived in an elite area with a standard deviation with 1 or higher at age 16 have lower likelihood of transitioning to parenthood at age 31 and 41. When current income and education where controlled for the effect of neighborhood stayed still stayed the same (see Table A3, in the appendix).
Table 2. Parameter estimates for ordinal logistic model, on contextual effects on attitudes

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Importance of having a good</td>
<td>Importance of being successful</td>
<td>Importance to do well</td>
<td>Importance of live</td>
<td>Importance of having</td>
<td>Importance of having time for</td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>in your occupation</td>
<td>financially</td>
<td>in a good couple relation</td>
<td>children</td>
<td>leisure, sports and hobbies</td>
</tr>
<tr>
<td></td>
<td>odds ratio</td>
<td>odds ratio</td>
<td>odds ratio</td>
<td>odds ratio</td>
<td>odds ratio</td>
<td>odds ratio</td>
</tr>
<tr>
<td></td>
<td>se</td>
<td>se</td>
<td>se</td>
<td>se</td>
<td>se</td>
<td>se</td>
</tr>
<tr>
<td>Woman compared to men</td>
<td>1.873***</td>
<td>0.654***</td>
<td>1.368***</td>
<td>1.728***</td>
<td>2.240***</td>
<td>0.976</td>
</tr>
<tr>
<td></td>
<td>(0.198)</td>
<td>(0.069)</td>
<td>(0.149)</td>
<td>(0.214)</td>
<td>(0.250)</td>
<td>(0.102)</td>
</tr>
<tr>
<td>Being born in 1974 compared to</td>
<td>0.851 (0.106)</td>
<td>0.986 (0.123)</td>
<td>1.026 (0.132)</td>
<td>1.129 (0.167)</td>
<td>0.875 (0.116)</td>
<td>0.796* (0.098)</td>
</tr>
<tr>
<td>1964</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled emp. compared to</td>
<td>1.121 (0.209)</td>
<td>1.293 (0.248)</td>
<td>0.998 (0.197)</td>
<td>1.088 (0.254)</td>
<td>1.133 (0.230)</td>
<td>0.923 (0.172)</td>
</tr>
<tr>
<td>unskilled emp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistant non-manual emp.</td>
<td>0.941 (0.175)</td>
<td>1.101 (0.212)</td>
<td>0.878 (0.172)</td>
<td>0.695* (0.153)</td>
<td>0.828 (0.161)</td>
<td>1.177 (0.222)</td>
</tr>
<tr>
<td>compared to unskilled emp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate non-manual emp.</td>
<td>1.513** (0.273)</td>
<td>1.204 (0.221)</td>
<td>0.884 (0.167)</td>
<td>0.772 (0.167)</td>
<td>1.059 (0.207)</td>
<td>1.082 (0.196)</td>
</tr>
<tr>
<td>compared to unskilled emp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionals non-manual emp.</td>
<td>1.565** (0.298)</td>
<td>1.680*** (0.324)</td>
<td>0.954 (0.191)</td>
<td>0.745 (0.171)</td>
<td>1.127 (0.231)</td>
<td>1.039 (0.198)</td>
</tr>
<tr>
<td>compared to unskilled emp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self emp. compared to</td>
<td>1.170 (0.221)</td>
<td>1.335 (0.260)</td>
<td>0.845 (0.168)</td>
<td>0.852 (0.196)</td>
<td>0.987 (0.200)</td>
<td>1.085 (0.209)</td>
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<td>unskilled emp.</td>
<td></td>
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<tr>
<td>Household disposable income at</td>
<td>1.000 (0.000)</td>
<td>1.000 (0.000)</td>
<td>1.000 (0.000)</td>
<td>1.000* (0.000)</td>
<td>1.000* (0.000)</td>
<td>1.000 (0.000)</td>
</tr>
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<td>16</td>
<td></td>
<td></td>
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<td>Single mother household</td>
<td>1.136 (0.226)</td>
<td>1.064 (0.218)</td>
<td>0.959 (0.202)</td>
<td>1.163 (0.279)</td>
<td>1.551** (0.346)</td>
<td>0.757 (0.148)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Factor1 Elite areas</td>
<td>1.092** (0.044)</td>
<td>0.992 (0.040)</td>
<td>1.014 (0.042)</td>
<td>1.001 (0.048)</td>
<td>0.928* (0.039)</td>
<td>1.034 (0.042)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor2 Foreign-born</td>
<td>1.073* (0.042)</td>
<td>1.032 (0.041)</td>
<td>1.027 (0.042)</td>
<td>1.009 (0.048)</td>
<td>1.027 (0.044)</td>
<td>1.098** (0.043)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor3 Low income non-migrant</td>
<td>0.916 (0.068)</td>
<td>0.996 (0.076)</td>
<td>0.897 (0.070)</td>
<td>1.021 (0.093)</td>
<td>0.975 (0.079)</td>
<td>0.914 (0.068)</td>
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<tr>
<td>Factor4 High employment low</td>
<td>0.872*** (0.046)</td>
<td>0.931 (0.050)</td>
<td>1.004 (0.055)</td>
<td>1.079 (0.067)</td>
<td>1.067 (0.061)</td>
<td>0.943 (0.050)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Factor5 Social assistance</td>
<td>1.006 (0.044)</td>
<td>1.010 (0.045)</td>
<td>1.014 (0.047)</td>
<td>1.059 (0.057)</td>
<td>0.995 (0.047)</td>
<td>1.017 (0.045)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Chi-square without</td>
<td>59.20</td>
<td>29.21</td>
<td>11.70</td>
<td>32.89</td>
<td>61.05</td>
<td>10.68</td>
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<td>neighborhood effects</td>
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<td>Chi-square with neighborhood</td>
<td>72.42</td>
<td>31.62</td>
<td>13.75</td>
<td>35.79</td>
<td>67.18</td>
<td>18.33</td>
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<td>effects added</td>
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<tr>
<td>Prob &gt; chi2 for contextual-</td>
<td>7.02e-10</td>
<td>0.00453</td>
<td>0.469</td>
<td>0.00112</td>
<td>6.22e-09</td>
<td>0.192</td>
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<td>level models</td>
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</table>

Notes: *** p<0.01, ** p<0.05, * p<0.1
Table 3. Parameter estimates for logistic regression (7) and cox proportional (8), on contextual effect on transition to parenthood

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman compared to men</td>
<td>1.849*** (0.311)</td>
<td>1.560*** (0.112)</td>
</tr>
<tr>
<td>Being born in 1974 compared to 1964</td>
<td>0.156*** (0.028)</td>
<td>0.652*** (0.058)</td>
</tr>
<tr>
<td>Skilled emp. compared to unskilled emp.</td>
<td>1.019 (0.253)</td>
<td>0.949 (0.117)</td>
</tr>
<tr>
<td>Assistant non-manual emp. compared to unskilled emp.</td>
<td>0.953 (0.230)</td>
<td>0.915 (0.111)</td>
</tr>
<tr>
<td>Intermediate non-manual emp. compared to unskilled emp.</td>
<td>0.919 (0.240)</td>
<td>0.906 (0.109)</td>
</tr>
<tr>
<td>Professionals non-manual emp. compared to unskilled emp.</td>
<td>0.888 (0.248)</td>
<td>0.810 (0.104)</td>
</tr>
<tr>
<td>Self emp. compared to unskilled emp.</td>
<td>0.936 (0.244)</td>
<td>0.897 (0.112)</td>
</tr>
<tr>
<td>Household disposable income at 16</td>
<td>1.000 (0.000)</td>
<td>1.000 (0.000)</td>
</tr>
<tr>
<td>Single mother household</td>
<td>0.984 (0.245)</td>
<td>0.893 (0.118)</td>
</tr>
<tr>
<td>Factor1 Elite areas</td>
<td>0.862*** (0.044)</td>
<td>0.906*** (0.026)</td>
</tr>
<tr>
<td>Factor2 Foreign-born</td>
<td>0.978 (0.050)</td>
<td>1.004 (0.025)</td>
</tr>
<tr>
<td>Factor3 Low income non-migrant</td>
<td>0.984 (0.098)</td>
<td>1.001 (0.050)</td>
</tr>
<tr>
<td>Factor4 High employment low social assistance</td>
<td>1.038 (0.073)</td>
<td>1.042 (0.037)</td>
</tr>
<tr>
<td>Factor5 Social assistance</td>
<td>0.957 (0.054)</td>
<td>0.956 (0.028)</td>
</tr>
</tbody>
</table>

Chi-square without neighborhood effects                                      | 226.7            | 83.86           |
Chi-square with neighborhood effects added                                   | 238              | 99.69           |
Prob>chi2                                                                   | 0               | 0               |

Notes: *** p>0.01, **p<0.5, *p<0.1

Figure 6. Kaplan-Meier survival estimates for transition to parenthood. Percentage of individuals that have experiences the event on the y-axis and analyze time in years on the x-axis.
5 Discussion

For this thesis the following research questions were explored:

1. What is the association between childhood neighborhood and the transition to parenthood?
2. What is the association between the childhood neighborhood and the individual attitudes in relation to the transition to parenthood?

By using these questions, the aim was to achieve the following three objectives: (1) Proving the importance of including contextual effects from childhood for predicting fertility behavior; (2) Providing a better understanding on how childhood neighborhood interacts with attitudes in regard of transition to parenthood; (3) Providing an alternative on measuring neighborhood effects when parish data is only available.

For the first question results from the cox proportional and logistic model (See table 3) indicated that childhood neighborhoods with high elite area characteristics leads to a delay in transition to parenthood. This implies, that by knowing the elite area characteristics of individuals neighborhood at age 16 allows one to better predict the timing of the transition to parenthood. For the second question, the ordinal logistic models (see Table 2) indicated neighborhood characteristics affected attitudes even when family backgrounds characteristics were controlled for. This implies, that by knowing the neighborhood characteristics at age 16, will increase ones understanding on what type of attitudes people have as an adult. Which in turn might lead to a better understanding on the fertility intention the individual might attain.

Based on the findings, growing up in an area characterized by being elite would mean that there is a high number of adults that are high income earners and who have finished their tertiary education. According to Jencks and Mayer’s (1990) concept of collective socialization theories or Manski’s (1993) contextual effects, adults in the neighborhood function as role models to the children within a neighborhood. For example, the children observe that most adults in their surrounding have finished their education and have a high income. Therefore, they themselves also want to achieve the same thing. This would mean that these individuals would be more likely to pursue education and a career, which might cause a delay in having children.

The effect from elite area is consistent with previous study from Anderson and colleagues (Andersson et al., 2015). They also observed a delay in the transition to parenthood from individuals growing up in neighborhood characterized by high number of foreign-born individuals, which was not significant in this thesis. Also, in this thesis none of the family background variables were significant, while
Andersson and colleagues found significant results for men growing up in single parent household in delaying the transition to parenthood. The study also showed a longer delay in the transition the higher the parent’s disposable income was when the individual observed was 16 years old. Compared to the study by Andersson and colleagues, this study does not perform separate analyses for men and woman (Andersson et al., 2015). The reason is that a similar separation would in this study reduce the sample to about the half, which would cause problems with statistical power.

The difference in results might come from this study using a watered-down version of the measurement. The original method of applying scalable neighborhoods uses the individual’s location data to create individualized neighborhoods of different scales. This study uses a watered-down version of it, where the average for each individualized neighborhood within a parish is calculated for each scale and then applied to the individual. Despite this, similar neighborhood types were identified as Andersson and colleagues (Andersson et al., 2015). So even in a less optimal form, the averages for each neighborhood scale by parish produce similar results. This indicate that using the parish variation for scalable neighborhood measurement is effective when looking at neighborhood effects in Sweden.

There are relatively few studies that have been done in Sweden for childhood neighborhood effects on fertility behavior. The one done by Hedman (2014) on teenage pregnancy showed no effect from neighborhood. Both this study and the one done by Andersson and colleagues have shown indication of childhood neighborhood affecting the timing of the transition to parenthood (Andersson et al., 2015). By observing the fertility behavior over time and not only during teenage years it seems a neighborhood effect can be observed in Sweden. One of the contributing reasons for this effect being observed can lie in the use of scalable neighborhood measurement. As seen in Andersson and Malmberg (2015), the neighborhood effects were five times better at predicting educational attainment then the use of SAMS area. While no similar comparative analyzes have been done in regards of fertility, it’s not unlikely that the same might hold true for fertility.

It should be noted that both this thesis and the study done by Anderson and colleagues are not accounting for selection bias fully (Andersson et al., 2015). Therefore, there is a risk of an overestimation of the neighborhood effect. For example, Hedman (2014) did observe a neighborhood effect but when controlling for selection bias the effect became almost nonexistent.

For the second question the assumption was neighborhood influencing attitudes related to fertility. Specifically, the attitudes of valuing having children. As observed individuals were seen to have lower propensity towards valuing having children if they grew up in neighborhood characterized by an elite area effect. This above behavior stays consistent with the first part of the theoretical model (see Figure 1 at page 9).
The theoretical model (see Figure 1 at page 9) dictates that neighborhood effect comes from factors such as role models, social network, peer influence etc. Which in turn affects the attitude towards having children or other competing attitudes. These attitudes are then seen to influence the intention of having children. Individuals from neighborhood heavily characterized by elite area effect, were less likely to feel that children are important in life. At the same time, these individuals were more likely to feel that education is important. This can be an aspect of the competitive attitude coming into play. As seen in figure 1 (see page 9), arrow f signifies the effect competitive attitudes can have on attitudes towards having children. Therefore, having strong attitude towards education might end up diminishing the effect of feeling that having children is important. The elite factor could be seen to operate through attitude such as importance of education.

As seen in figure 6, most individuals end up having children. Which is consistent with the sentiment expressed by Swedish population (SCB, 2009:2). The two main reasons for Swedes in delaying transition to parenthood was not finding the right partner and the importance of experiencing other parts of life first (SCB, 2009:2). None of the neighborhood characteristics was found to affect the attitude of importance of life in a good couple relation, which was the estimation used for not finding the right partner attitude. For experiencing other parts of life first the importance of having time for leisure, sports and hobbies was used. In this regard neighborhoods characterized with foreign-born factors were positively related. While not in this thesis, Anderson and colleagues did find in their study an effect from the foreign-born characteristic (Andersson et al., 2015). It could be argued that some of the effect from the foreign-born characteristics is showing itself through wanting to of experiencing other parts of life first.

All the analyzes here on neighborhood effect and attitudes in relation to fertility is highly tentative in this thesis. No actual model has been done for estimating attitudes as mediating effect, as this thesis is only exploring the most rudimentary form of the relationship between attitudes and neighborhood. Even in attitude part the self-selection bias is not controlled for fully, increasing the risk of having overestimated the neighborhood effect. Neither perceived behavioral control nor subjective norm were studied in this thesis. Subjective norm has proven to be more effective than attitude and perceived behavioral control for the intention to become a parent (Billari et al., 2009). A two-child norm could potentially be reinforced by having a high number of adults in the area that have two children. The strong gender preference for having one child of each sex in Sweden is strong enough to drive individuals to have a third child just to attain it (Andersson et al, 2006). This can be observed as another type of normative pressure. Attitude on the other hand, have been more relevant in higher-order births (Billari et al., 2009).
There is however a high probability that the lack of results might be a product of the limitations of the data used. Currently, this study only uses one question for each type of attitude. Also, Table 1 indicated a strong positive bias in the answers on the attitude questions. This means the current measurements by themselves do not do a good job in differencing the individuals from one another. Using more indicators, or more elaborate measures, to classify individuals’ attitudes may have given a better estimation compared to only using these general questions separately but was not possible within the scope of this thesis. Attitudes are also being measured at age 31 and 41. Around this age a lot of individuals already have had children as seen in figure 6. One could also assume that education have already being attained. The attitudes measured during this time point might differ a lot form attitude measured in earlier tweenies.

Further, the parishes not being geocoded data, which is the intended use for the scalable neighborhood measurement. Instead of observing how the neighborhood context was at age 16 for the 1964 birth cohort, neighborhood characteristics 10 years after is being applied (see figure 2 at page 16). A lot of missing data is present in the data set causing the initial observation to drop from 2242 to 288 observations. Research have indicated that neighborhood effects seem to be stronger the longer the individual are present in the area (Wodkte, 2013; Chetty and Hendren, 2016). If the entire duration would have been controlled for the neighborhood effects, the estimators might have been stronger.

With the limitations from the data set and not accounting for selection bias, this results and analysis should be interpreted with caution. Despite this we do observe an effect form neighborhood on both attitudes and the transition to parenthood. One of the more interesting findings being a neighborhood effect on attitudes that are measured at age 31 and 41. Indicating neighborhood effects from childhood remains even after 25 years in regards of attitudes.

6 Conclusion

This thesis hade three main objectives: (1) Proving the importance of including contextual effects from childhood for predicting fertility behavior; (2) Providing a better understanding on how childhood neighborhood interacts with attitudes in regard of transition toparenthood; (3) Providing an alternative on measuring neighborhood effects when parish data is only available.

The findings here demonstrate that growing up in an elite area in Sweden makes one more likely to experience a delay in the transition to parenthood. This have been observed in this thesis, and in a prior study done by Andersson and colleagues (Andersson et al, 2015). Based on its findings this
thesis argues that neighborhood effect should be a factor which researcher focusing on fertility behavior should account for. Only focusing on family background effects might give an incomplete picture on the effects from childhood.

With the parish measurement version of scalable neighborhood method being successful in capturing similar effects as Anderson and colleagues, this study fulfils the objective of providing an alternative of measuring neighborhood effects when parish data is only available. The neighborhood indicators used are from the ResSegr dataset, which aims to create a European database with segregation measures that are comparable across cities and countries (Residential segregation in Europe, 2018). Making the possible of using the parish variation of it applicable for research in other countries.

The relationship between fertility related attitudes and neighborhood effects in relation to attitude have been assumed to be one of the main ways for neighborhood effects are transmitted through. While attitude functioning as mediating effect is not something which have been fully studies in this thesis. By providing a conceptual framework on how the interaction between neighborhood effects and attitude, with the addition of observing neighborhood effects on attitudes even 15 years, this thesis can serve as basis on how future research might study neighborhood effects in combination with attitudes in regards of fertility behavior. Also, it is striking that we find neighborhood effects from childhood context even after 15-25 years. This is one of the more important results of this study.

Limitation of only using one attitude question as indicators and only from one time point lower the quality of the attitude indicator used. The lack of control of selection bias makes it unclear if the effect is coming from neighborhood. For example, family background effects are not being fully controlled for, causing a risk of overestimation of the neighborhood effect itself.

While this thesis found an effect from neighborhood, it’s not clear how and why growing up in an elite area is causing a delay in the transition to parenthood. As such this thesis argues for two different research avenues future researcher need to continue exploring. First, the definition and measuring of the neighborhood effect. The scalable neighborhood measurement shows indication in being successful in capturing effect in a Swedish context. But there are more ways in measuring neighborhood effect than only aggregating individual characteristics within an area (which what is being done in this thesis). For example, by using schools instead of neighborhood can be of more relevance as interaction between individuals occur causing contextual and endogenous effect being present. Another way would be to create neighborhood measurement by aggregating individual values within a neighborhood, this is one of the approaches argued by Sampson (2012) but requires a lot of resources. Malmberg (2014) made use of the approach argued by Sampson (2012) and found attitudes even being a stronger indicator than family background effects.
Second, identifying and explaining the causal relationship between neighborhood and individuals’ behavior. As argued by thesis and other researcher such as Forte and Tienda (1996), attitudes could be one of the ways neighborhood effects are transmitted through. For example, the findings for this thesis indicate a long-lasting effect coming from childhood neighborhood on attitudes. The next step would be to identify if this effect ends up influencing fertility behavior. With other factors such as perceived behavioral control and subjective norms being present, identifying the effect from attitude would require to also control for these factors. If one wants to better identify the effect which is coming from attitudes, making use of multiple different attitudes and more indicators for each attitude would be advisable. There is an importance in also measuring attitudes earlier than age of 31, as the effect could be non-linear. With a stronger effect in earlier twenties with declining effect over time. In this regard, making use of panel dataset such as Family and Working Life among Young Adults in the 21st Century the Young Adult Panel Study (YAPS) would be helpful. It offers wider survey of individuals’ attitudes at earlier adult ages. Even with better survey data one needs to better account for selection bias, which means using random effect models, instrumental models or fixed effect models as a base of comparison.

There is a lot of potential research that can be done for neighborhood. Hopefully more will be explored, as a lot of questions stills need to be answered before a proper assessment can be made on the role neighborhood effects from childhood have in regards of fertility

7 Acknowledgements

First of all, I would like to thank my two supervisors Bo Malmberg and Maria Brandén for guiding me throughout the thesis. Without their support this thesis would not have been possible. I am also grateful for the help provided by Stefan Ene in transforming the ResSegr dataset. His help on the use on ArcGIS have been invaluable. Finally, I would like to thank Gunilla Svingby, Francesco Rampazzo, Axel Lindqvist and my family with the feedback they have given me on the thesis. I believe with their help I was able to provide a thesis on complex subject but still make it understandable for people outside the field.
8 References


Statistics Sweden, Demographic reports 2009:2, Having children or not? Results from a questionnaire survey about women’s and men’s attitudes towards having children.


9 Appendix

9.1 Figure A1

Figure A1. Factor loadings at different scales. Loadings on the y-axis and k number of closest neighbors on the x-axis.
9.2 Table A1

Table A1. Descriptive for family background variables on having a child

<table>
<thead>
<tr>
<th>Highest SEI code of father and mother (grouped)</th>
<th>Freq.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unskilled emp.</td>
<td>188</td>
<td>14.68</td>
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<tr>
<td>Skilled emp.</td>
<td>196</td>
<td>15.30</td>
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<tr>
<td>Assistant non-manual emp.</td>
<td>204</td>
<td>15.93</td>
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<td>Intermediate non-manual emp.</td>
<td>248</td>
<td>19.26</td>
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<td>Professionals non-manual emp.</td>
<td>247</td>
<td>19.28</td>
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<tr>
<td>Self emp. other than professionals and farmers</td>
<td>198</td>
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<td>Family household</td>
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<td>Single Parent</td>
<td>1157</td>
<td>90.32</td>
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<td>Other</td>
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<table>
<thead>
<tr>
<th>Household disposable income at 16</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>90%</th>
<th>Mean</th>
<th>Std.dev</th>
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<td>251312</td>
<td>322672</td>
<td>388064</td>
<td>261351</td>
<td>109641</td>
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9.3 Table A2

Table A2. Descriptive for control variables on having a child

<table>
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<th>Highest SEI code of father and mother (grouped)</th>
<th>Freq.</th>
<th>Percent</th>
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</thead>
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<tr>
<td>Primary and lower secondary education</td>
<td>81</td>
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</tr>
<tr>
<td>Upper secondary education</td>
<td>644</td>
<td>50.27</td>
</tr>
<tr>
<td>Post-secondary education less than two years</td>
<td>98</td>
<td>7.65</td>
</tr>
<tr>
<td>Post secondary education, two years or longer</td>
<td>450</td>
<td>35.13</td>
</tr>
<tr>
<td>Postgraduate education</td>
<td>8</td>
<td>0.62</td>
</tr>
<tr>
<td>Birth cohorts</td>
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<td></td>
</tr>
<tr>
<td>1964</td>
<td>609</td>
<td>47.54</td>
</tr>
<tr>
<td>1974</td>
<td>672</td>
<td>2.46</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Man</td>
<td>570</td>
<td>44.50</td>
</tr>
<tr>
<td>Woman</td>
<td>711</td>
<td>55.50</td>
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<table>
<thead>
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<th>Disposable income at 2003</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>90%</th>
<th>Mean</th>
<th>Std.dev</th>
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<td>139260</td>
<td>173168</td>
<td>214498</td>
<td>263992</td>
<td>181261</td>
<td>71764.8</td>
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9.4 Table A3

**Table A3.** Parameter estimates for logistic regression on contextual effect on transition to parenthood with current income and education controlled for

<table>
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<tr>
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<th>Model 9</th>
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<tr>
<td></td>
<td>odds ratio</td>
<td>se</td>
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<td>Woman compared to men</td>
<td>2.204 ***</td>
<td>(0.311)</td>
</tr>
<tr>
<td>Being born in 1974 compared to 1964</td>
<td>0.169 ***</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Disposable income</td>
<td>1.00 ***</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Upper secondary education</td>
<td>1.50</td>
<td>(0.422)</td>
</tr>
<tr>
<td>Post-secondary education less than two years</td>
<td>0.483 ***</td>
<td>(0.172)</td>
</tr>
<tr>
<td>Post-secondary education two years or longer</td>
<td>0.782</td>
<td>(0.229)</td>
</tr>
<tr>
<td>Skilled emp. compared to unskilled emp.</td>
<td>1.05</td>
<td>(0.253)</td>
</tr>
<tr>
<td>Assistant non-manual emp. compared to unskilled emp.</td>
<td>0.923</td>
<td>(0.230)</td>
</tr>
<tr>
<td>Intermediate non-manual emp. compared to unskilled emp.</td>
<td>.99</td>
<td>(0.240)</td>
</tr>
<tr>
<td>Professionals non-manual emp. compared to unskilled emp.</td>
<td>0.988</td>
<td>(0.248)</td>
</tr>
<tr>
<td>Self emp. compared to unskilled emp.</td>
<td>0.956</td>
<td>(0.244)</td>
</tr>
<tr>
<td>Household disposable income at 16</td>
<td>1</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Single mother household</td>
<td>0.961</td>
<td>(0.245)</td>
</tr>
<tr>
<td>Factor1 Elite areas</td>
<td>0.857***</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Factor2 Foreign-born</td>
<td>0.981</td>
<td>(0.050)</td>
</tr>
<tr>
<td>Factor3 Low income non-migrant</td>
<td>0.980</td>
<td>(0.098)</td>
</tr>
<tr>
<td>Factor4 High employment low social assistance</td>
<td>1.03</td>
<td>(0.073)</td>
</tr>
<tr>
<td>Factor5 Social assistance</td>
<td>0.955</td>
<td>(0.054)</td>
</tr>
</tbody>
</table>

**Chi-square**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
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<tr>
<td>276.51</td>
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Prob>chi2

<p>| |</p>
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<td>0.00</td>
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*** p<0.01, ** p<0.05, * p<0.1