Neighborhood effects on family size

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1 Introduction

Peer effects on fertility behavior are examined in a large and growing body of research. Social interaction effects can amplify the effects of small changes, with peers acting as 'social multipliers' (Glaeser et al. 2003; see also Manski & Mayshar 2003). Peers provide information on the costs and benefits of additional children; they may act as role models or simply as a reference for what is seen as normal or desirable family size. Unfortunately, peer effects are notoriously hard to detect, both due to individuals choosing peers who are similar to themselves, and peers being influenced by shared environment. Previous studies indicate that fertility behavior is influenced by friends (Balbo & Barban 2014), siblings (Lyngstad & Prskawetz 2010), colleagues (Pink et al. 2014) and network members in general (Lois & Becker 2014).

Neighbors are another example of peers that may influence fertility. Fertility behavior is known to be correlated within residential areas (see e.g. Boyle et al. 2007; Meggiolaro 2011). The mechanisms behind this are not yet well understood. In most previous studies it remains unclear whether the correlation reflects families with similar characteristics selecting into the same neighborhood, a common environment, or endogenous peer effects. To test the latter explanation, we ask whether the decision to have a larger-than-typical family is linked to the proportion of close neighbors who have at least three children themselves.

We handle selection and correlated effects by using the 'sex mix instrumental variable' (see Angrist & Pischke 1998). Having two first born children of the same sex significantly increases the propensity to have a third child, as many parents prefer having one child of each sex. As child sex is random, the sex composition of the two first born children should not be correlated with characteristics of the neighborhood or neighbors. If so, neighbors' children sex mix provides us with a plausible instrument to identify the effect of neighbors' family size on a couple's decision to have another child.

2 Background

Neighbors form an interesting case for the study of social influence, because at least for families neighbors are quite present in everyday life, whether it is at the local kindergarten, school or playground. Neighbors may exchange ideas, knowledge and perceptions of norms. Through such social learning neighbors have the potential to shape what is seen as a normal or desirable number of children, and in turn influence each other's fertility behavior (Bernardi & Klärner 2014). Still, our (causal) knowledge of the influence of neighbors on fertility behavior remains very limited.

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Social influence on the transition to parenthood has been documented for other peer groups. Individuals whose friends, acquaintances and siblings have young children are more likely to become parents, net of initial childbearing intentions (Lois & Becker 2014). An individual's risk of becoming a parent has also been found to increase after siblings (Lyngstad & Prskawetz 2010) and high school friends childbearing (Balbo & Barban 2014), and the year after a colleague gives birth to a child (Pink et al. 2014). Pink et al. (2014) emphasizes perceived similarity as an important amplifier for social learning effects, arguing that this should imply a parity specific social influence.

Social influence among neighbors is examined for a range of individual outcomes (e.g. Maurin & Moschion 2009; Sampson et al. 2002), but fertility contagion among neighbors has been studied mostly in high-fertility contexts (Jennings & Barber 2013; Weeks et al. 2004). Still, there is evidence that contextual factors such as settlement size or opportunity structures for families in a municipality also matter for fertility behavior in low-fertility countries (e.g. Kulu et al. 2007; Kravdal 2002; Rindfuss et al. 2010). However, no study has yet tested causal interaction effects of neighbors' family behavior in a low-fertility context.

As we are interested in variations in family size, our study focuses on immediate neighbors' family sizes and their effect on further childbearing. Among Norwegian women in the birth cohorts we study, three children represent a typical larger family size.[1] Two-child parents are usually more settled and more prone to interact with neighboring parents, for example at the local playground, which means that social influence among neighbors should be most detectable among them.

3 Data and methods

This study is based on combined individual level records from several Norwegian administrative registers covering the whole population of Norway. Our study sample (index persons) is women aged 25 to 35 who gave birth to a second child in 2004 or 2005 (~ 30 000 individuals), and our main outcome of interest is the probability of having a third child before censoring (2014).

Using geographical coordinates for place of residence in 2005, we define a closer neighborhood for each individual woman, consisting of her 50 nearest female neighbors aged 20 to 44.[2] Among these 50 nearest neighbors we select as 'potential influencers' women aged 25 to 35 who gave birth to a second child during the years 2000, 2001, 2002 or 2003, meaning that the neighboring women's second child is aged 0-5 when the women in the study sample have a second child.[3] The 'children sex mix' instrumental variable is then derived from the proportion of potential influencers with two first born children of the same sex, and hence measured on the (local) aggregate level.

[1] As in many European countries there exists a strong two-child norm in Norway (Sobotka & Beaujoan 2014), and comparatively low shares of Norwegian mothers have one child only (Dommermuth et al 2015). While a substantial share of mothers has three children, parity transitions beyond the third are much more rare (Dommermuth et al. 2015). This makes the third parity transition particularly suited for the study of family size contagion in Norway, as this choice margin is the most relevant in Norway today (Cools 2013).

[2] In this first 'neighborhood finding'- step restrictions on female neighbors aged 20 to 44 are done to avoid double counts of neighboring families. Further delimitations are additionally set because mechanisms of social influence require a certain degree of similarity.

[3] Both for the females under study and their neighbors, we exclude those from the sample who have twins at the second birth.

4 Preliminary results

In Table 1, neighborhoods are grouped by shares of neighboring families with firstborns of the same sex. We show neighborhoods in the lowest (row a) and highest quartile (row b) of this distribution and compute differences in characteristics between these two subgroups (last row). First, we test whether the instrument has a first stage, i.e. whether the proportion of neighbors with two first born children of the same sex indeed influences the proportion of neighbors with three children. Column 1 confirms this, showing that the proportion of influencers with three children is correlated significantly and positively with the proportion of influencers with three children. In column 2-5, we assess whether the instrument is randomly assigned with respect to observable characteristics. Reassuringly, column 2-5 show no significant differences in the index persons' characteristics by the sex composition of the neighbor's children, indicating random assignment.

Tab. 1: Demographic characteristics of index persons and neighboring mothers continued fertility, by share of neighboring families with firstborns of the same sex

		Neighbors	**Index persons**				
	N	*(1)* *3rd child within 2014*	*(2)* *Age in 2005*	*(3)* *Firstborns Same Sex*	*(4)* *Higher education*	*(5)* *Highest income quartile*	*(6)* *3rd child within 2014*
(a) < 0.25	6761	0.436	30.981	0.512	0.500	0.258	0.399
		(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
(b) > 0.75	5161	0.485	30.917	0.508	0.506	0.273	0.397
		(0.01)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)
Difference (a) - (b)		-0.049***	0.064	0.005	-0.007	-0.015	0.002
		(0.01)	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)

Notes: Women aged 25-35, two children or more, second child born in 2004 or 2005 (N=29 981). Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The results thus also indicate that there is no significant increase in third birth probabilities among index persons in neighborhoods with high shares of families with two firstborns of the same sex (column 6). In other words, an index person's family size does not seem to be influenced by the neighbors' family size.

5 Discussion and plans for further analysis

Fertility behavior is known to be correlated within neighborhoods, yet the mechanisms behind often remain unclear. We test the explanatory power of social contagion for this phenomenon.

Our preliminary results indicate that the children sex mix instrument is valid, meaning it creates exogenous variation across neighborhoods in the distribution of couples with a larger-than-typical family. The present descriptive results indicate no significant effect of neighbors' family size on index persons' continued fertility, speaking against endogenous peer effects among neighbors as a plausible explanation for the correlation of family behavior within neighborhoods.

In the full paper, selection and correlated effects will be handled by an Instrumental Variable analysis (2SLS), using the sex composition of neighbors eldest children as an instrument for neighbors' family size. We also intend to explore whether fertility contagion varies across subgroups, with some individuals eventually being more prone to social influence by neighbors than others. Furthermore, we will use the same instrument to test whether selective moves of families can provide a causal explanation for the observed spatial correlation in fertility.

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