

Fertility in Context: Exploring Egocentric Neighborhoods in Accra, Ghana

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Extended Abstract

There is a substantial literature on the relationship between health behaviors/outcomes and the kind of neighborhood (the context) in which one lives. While the magnitude of effects varies, the overall conclusion has been that many different types of behavior are related in some way or another to the environmental context. There remains, however, a host of unresolved theoretical and methodological issues (see, for example, Chaix et al. 2009). The principal theoretical concerns relate to what is expected from the environment—how does the environment influence behavior? Will some types of environments influence certain behaviors differently than others? Should we be focusing on residential context or activity spaces or some other conceptualization of the environment in which a person lives? (Kwan et al. 2008; Matthews 2008). This latter issue flows into the methodological question of how a neighborhood or, more generally context, is to be measured. The vast majority of research has employed a territorial measure of neighborhood and assumed that all people within a defined territory/neighborhood/context are affected in the same way by that environment. A new set of studies, small in number so far (e.g., Logan et al. 2011; Matthews 2011), looks at egocentric neighborhoods—environmental contexts that are unique to each individual. In this paper, we compare these two approaches using data that we have collected in Accra, Ghana.

We employ data from the Women’s Health Survey of Accra (WHSA). The first wave of data (WHSA-1) was collected in 2003 from a multi-stage cluster probability sample of 3,000 women residing in 200 of Accra’s 1,774 EAs (Hill et al. 2007). The survey was repeated by our team in 2008-09 (WHSA-2) and 1,810 of the original respondents were re-interviewed, while an additional 1,004 respondents were substituted for those women who had died, moved, or otherwise could not be found. The location of each household in which a woman was interviewed in 2008-09 was recorded with a handheld GPS unit, so for those 1,810 women who were interviewed at the same home in both surveys we have data for two points in time. We have a range of health, reproductive health, sociodemographic, and housing data for each woman, and we have data classified from high spatial resolution satellite images for two dates close to each survey. These imagery data provide a way of contextualizing the natural and built environment within a given distance around each woman’s residence (Weeks et al. forthcoming), and represent our implementation of an egocentric neighborhood.

Our interest is in the relationship between fertility levels and the environmental context in which women live, following up on our earlier finding that certain kinds of territorial neighborhood boundaries in Accra do help to explain the variability in fertility from one part of the city to another (Weeks et al. 2010). We want to know if this conclusion is stronger (our expected alternative hypothesis) or no different (the null hypothesis) when we derive an environment based specifically on the location of a woman’s household—an egocentric neighborhood.

Note that we do not assume direct causality between the environment and fertility. Such causality is conceptually viable when the dependent variable is, for example, blood pressure that might be influenced by neighborhood walkability, or a respiratory disease that might be influenced by local environmental air pollution (see, for example, Sallis and Owen 2002; Lee, Ewing, and Sesso 2009). The number of children a woman bears is unlikely to be directly affected by the place in which she lives. Rather, we view measures of the physical and built environment as proxies for (indicators of) other unmeasured variables (beyond her or her partner's sociodemographic characteristics) that influence the decisions that women make about marriage, fertility preferences, and the use of various methods of fertility control to achieve the preferred family size. A novel element in our research is that we define the environmental context in terms of the physical and built environment as classified from high spatial resolution commercial satellite imagery. We then create buffers (isotropic zones) around the GPS point representing each woman's household. We use buffers of varying size and explore multiple aspects of the imagery to test the sensitivity of fertility rates to different egocentric contexts.

An important methodological difference between territorial neighborhoods and egocentric neighborhoods is that the former represent a second analytical level in a multilevel regression model, whereas the latter are attributes of individuals and are thus analyzed statistically at the same level as other individual characteristics. We will be evaluating the differential ability to predict fertility levels from these two different approaches. At the same time, since egocentric zones may overlap among women, we will test and, if necessary, control for the presence of spatial autocorrelation.

Overall, the results will expand our understanding of the way in which territorial contexts differ from egocentric contexts, and will improve our knowledge of the way in which context is related to reproductive behavior among women in a major city of a developing country.

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