

# How family networks drive residential location choices:

Evidence from a stated preference field experiment in Bogotá, Colombia

*The rapid and unplanned urbanisation in developing world cities presents a variety of challenges for these areas. To address these challenges, developing cities are implementing large-scale programmes which radically transform these urban areas and have significant consequences for local social ecosystems. Aiga Stokenberga who conducted her doctoral research at Stanford University, focuses her research on developing a better understanding of the social context and drivers of residential mobility. This can lead to new economic models that are better adapted to the needs of these urban areas, such as Bogotá, Colombia.*

Population increase in developing world cities is predicted to account for nearly all the growth in global urban population between now and 2050. The rapid and largely unplanned urbanisation is creating a number of challenges in these cities, including an increased residential vulnerability to various risks and a threat to the economic livelihoods of the urban poor. As a result of these challenges, developing cities are beginning to implement large-scale urban development, redevelopment and housing programmes, which drastically change the urban environment, with potentially irreversible consequences on the local social ecosystems. Despite the implementation of such programmes, there is a lack of evidence on the role of these social ecosystems in improving the livelihood security of their poorest residents or in influencing residential location decisions. Focusing on the case of Bogotá, Colombia, Aiga Stokenberga's work aims to provide a deeper understanding of the environmental and social drivers of residential mobility, which can contribute to the development of more appropriate economic, and especially housing and

location choice, models for both Bogotá and other urban areas.

## ENVIRONMENTAL RISKS OF URBANISATION

The worldwide incidence of environmental hazards is increasing. Furthermore, the continuing urbanisation in hazard-prone areas is increasing the damage potential associated with the hazards. Urban flooding alone can cause global economic losses as high as \$40 billion annually. In light of the rapid urbanisation in developing cities, governments are looking for policy solutions to address the issues of land scarcity and environmental pressures.

Housing across the world has historically occupied a large percentage of urban land and also represents a major investment for many households. In Colombia, housing represents around 70% of the total household wealth. Understanding the factors which influence

housing consumption and residential mobility is important to inform and improve the allocation of resources, such as land. Stokenberga's research involved developing a hedonic pricing model to look at the extent to which exposure to environmental risk is internalised in housing values. Hedonic models identify price factors based upon the premise that price is determined both by internal characteristics of the good being sold and external factors affecting it. Her model included housing attributes (such as the number of rooms and utility access), socioeconomic and physical characteristics (such as population density, employment access, and share of residential land use) as well as flood and landslide risk.

Applying the hedonic pricing model to Bogotá, it was found that whilst flood and landslide risk have similar effects in the overall rental market, reducing average monthly rents by 19-26%, the effects were quite different depending on the housing type. Flood risk lowered home rent significantly more than landslide risk. This was different to apartments, where both types of risk had a comparable effect. Stokenberga's research suggests that aggregate economic benefits would thus be largest when focusing risk mitigation interventions on homes affected by floods and lowest if focusing on risk mitigation in the apartments sub-market in Bogotá. The rental discount associated with flood risk in Stokenberga's work was significantly higher than has been reported in previous studies. This is because such research has mostly focused on a different context – developed world cities – and applied a different modelling approach. Namely, the models used in other studies did not account for measurement error and endogeneity associated with formal risk designation, and may have omitted important variables, potentially leading to underestimation of the effect of environmental risks on the housing market. Stokenberga's research



thus emphasises the importance of accounting for omitted variable bias and measurement error associated with formal risk designation when assessing the environmental risks of urbanisation.

## FAMILY NETWORKS AND RESIDENTIAL LOCATION CHOICES

Previous research on housing choice has used a hedonic framework to explore individual preferences, assuming that people select housing by equating the benefits of each housing attribute to the price of each attribute. However, an increasing amount of studies use a stated preference method to estimate the effects of different housing and locational attributes on consumers' decisions. An advantage of the stated preference method is that it can include variables, such as personal network characteristics, which are not typically measured in other methods.

Stokenberga's research used the stated preference method to explore the relative importance of proximity to extended family networks in the stated residential location choices of Bogotá's low-to-middle-income residents. Her work found that individuals preferred living near their extended family and tended to prioritise this over accessibility to the central business district, the city's main formal

employment centre. Individuals who had relied on help from extended family members in a personal or economic crisis situation showed a stronger preference for living near extended family than those who had not. Individuals who relied upon extended family for childcare assistance also exhibited this preference.

Stokenberga's work expands the notion of 'economic rationality' by more thoroughly characterising the preferences of the urban poor. In doing so, her research elucidates a possible causal mechanism behind the housing choices which might appear irrational. This includes the choice to stay in settlements of poor structural quality, with poor connectivity to the central business district or those which are prone to environmental hazards.

## SOCIAL NETWORKS AND LIVELIHOOD SECURITY

Social networks not only influence economic decisions in everyday life but also hold the potential to improve economic conditions and livelihood security for the most vulnerable households. Furthermore, economic development or decline, as well as the changes in the physical and spatial planning patterns of communities that often follow, can change the existing social structures and personal network characteristics. For both social and economic policy purposes, it is important to understand if in a given society individuals are isolated or receive support from others and if informal networks can provide access to personal support, economic, and informational resources that may not be available

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through public institutions and formal support networks.

Stokenberga applied social network analysis tools to uncover some of the socioeconomic boundaries present in personal social networks and the way in which these boundaries influence access to resources that are important for personal well-being and livelihood security in Bogotá. Her research found that most individuals' social networks were spatially very concentrated and the vast majority of the contacts belonged to the same socioeconomic group. When any socioeconomic or educational achievement diversity within networks did exist, it was a result of upward socioeconomic mobility of the people of one's own family (specifically children) rather than due to meeting diverse people outside the family through recreational, employment, or other types of activities.

Stokenberga's research also emphasised the importance of the socioeconomic diversity of non-family network ties as well as highlighted the improved resource access through networks dominated by family ties. Family ties were particularly indispensable for accessing personal advice and practical help. Non-family ties were found to be helpful for accessing resources for upward social mobility, such as education or specialised knowledge. The diversity of socioeconomic strata represented amongst these non-family ties and the diversity of their educational achievement were both found to have a significant positive effect on resource access.

Finally, Stokenberga's research found that the size and composition of individuals' support networks – and, therefore, resource access through these networks – was statistically related to the urban environment in which the individuals live. Better accessibility to the city centre



Candelaria neighborhood, Bogotá.

was found to enhance resource access through its positive impact on network size and its mean education level. Greater density of the built environment was associated with improved resource access through its negative effect on the spatial dispersion of network ties. Land use homogeneity reduced resource access by negatively affecting the networks' socioeconomic diversity. Many of the socioeconomic characteristics and behaviours of individuals were predictive of the characteristics of their personal social networks and resource access through the networks. For example, participation in virtual networks played a large role, particularly in accessing resources through non-family ties.

#### RESULT AND CONTRIBUTION

Stokenberga's work exploring the relationships between the urban physical environment and the social environment makes an important contribution to the research literature. It places economic decisions, such as those related to housing consumption, in a social context and expands the notion of 'economic rationality' by more thoroughly characterising the livelihood strategies of the poor living in Bogotá. In doing so, the research uncovered possible causal mechanisms behind seemingly irrational choices and revealed common drivers behind such choices. Her research highlighted that when considering 'economic rationality', it is important to account for the portion of the overall quality of life delivered through embeddedness in social structures, especially in extended family networks. For residents in Bogotá, this aspect of life quality was equally important in housing choices as the quality of the physical environment.

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# Behind the Research

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### Research Objectives

This research aims to investigate the environmental and social drivers of residential mobility in urban areas, which can contribute to the development of improved economic models and public policies that are more suited to these areas.

### Detail

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#### Bio

Aiga Stokenberga holds a BA from Franklin University Switzerland, an MA from Johns Hopkins University School of Advanced International Studies, and a PhD from Stanford University. Prior to starting the PhD programme at Stanford's Emmett Interdisciplinary Program in Environment and Resources (EIPER), Aiga worked as a researcher at the World Resources Institute, the Ross Center for Sustainable cities, and the World Bank's Sustainable Development Department. After finishing her PhD, Aiga returned to the World Bank in late 2016.

#### Funding

Stanford Interdisciplinary Graduate Fellowship (SIGF) and summer research support from Emmett Interdisciplinary Program in Environment and Resources (EIPER).

#### Collaborators

- James Sweeney, Daniel McFarland, Leonard Ortolano at Stanford University.
- Daniel Chatman at University of California at Berkeley.

### References

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### Personal Response

#### Where do you see the focus of your research within the next five years?

My current analytical work focuses on the accessibility and poverty impacts of large urban transport investments in developing country cities, as well as on developing spatial analysis methods and tools that can inform land use and territorial planning at a regional level. My longer-term research interests relate to better understanding the interactions between different types of informality in affecting the economic productivity of developing cities, including the labour and housing market informality as well as continued high reliance on informal public transport systems.



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