



# Keep your friends close: The effect of local social networks on child human capital outcomes



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## ARTICLE INFO

### Article history:

Received 18 July 2011

Received in revised form 11 March 2013

Accepted 20 March 2013

### JEL classification:

I12

O10

Z10

### Keywords:

Nutrition

Health

Social networks

Uganda

## ABSTRACT

Social networks can affect demand for human capital investments by relaxing household time or budget constraints or by defining and reinforcing human capital preferences. However, empirically identifying the effect of social networks on human capital investment is usually problematic because households self-select their networks in ways that may be correlated with their abilities to make these investments. In Northern Ugandan Internally Displaced Persons Camps, networks were not entirely self-selected. Rebel activity, which forced households into camps in 2002, disrupted pre-existing social networks in ways that were exogenous to household human capital preferences. This paper uses the exogenous variation in network disruption to identify a positive impact of networks on children's long-term nutritional outcomes.

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## 1. Introduction

Local social networks – the people that a household spends time with on a daily basis – can critically influence time-sensitive household behaviors. In particular, these local networks may affect the level of households' daily investments in children's nutrition, which is determined largely by the interaction of time-consuming care-giving practices and food and health resource availability. In most cases, it is impossible to demonstrate whether or not these networks ultimately improve child nutritional outcomes because households self-select into networks in ways that may be correlated with their abilities to invest in their children's nutrition. Using data collected in Northern Uganda, this study takes advantage of an exogenous disruption to households' local social networks, caused by a rapid escalation of a long-standing civil conflict, to show that the presence of a household's local network improves nutritional outcomes of the household's youngest members.

Recent empirical work has demonstrated the importance of a household's social network to a number of economic outcomes and decisions, such as access to employment (e.g. [Ioannides and Loury, 2004](#); [Magruder, 2010](#); [Munshi, 2003](#); [Topa, 2001](#)), participation in social

programs ([Aizer and Currie, 2004](#); [Bertrand et al., 2000](#)), and retirement investment decisions ([Duflo and Saez, 2003](#)). In developing countries, the role of social networks may be more important as a means of overcoming market failures or the absence of other institutions. Trust relationships function in the absence of contract-enforcement mechanisms ([Fafchamps, 2004](#); [Greif, 1993](#)), and networks provide insurance and credit systems where formal markets do not ([Besley, 1995](#); [Grimard, 1997](#); [Rosenzweig, 1988](#); [Townsend, 1995](#)). Finally, networks are a significant source of information about technology, health care, and returns to investment ([Conley and Udry, 2010](#); [Leonard, 2007](#); [Yamauchi, 2007](#)), and affect use of health care technologies ([Oster and Thornton, 2009](#)).

This paper focuses on a specific type of network, the local social network, that influences households' investments in child nutrition through daily contact with household members. The cumulative effect of these daily investments improves nutritional outcomes. A household's social network in general can influence the household's ability to make nutritional or health investments by expanding the household resource pool or reducing investment risks. Local social networks increase investments in child nutrition in ways requiring more frequent contact and stronger ties, such as through coordinating daily activities and framing and reinforcing certain health-seeking behaviors. For example, members of sufficiently large localized networks benefit from economies of scale in human capital production by sharing child care and home production activities. Local social networks also can increase nutritional investments by restricting the

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household's resource allocation choices to those that are potentially better for young children.<sup>1</sup> As the network grows, the ability of the network to monitor and reinforce these norms and the possibilities for coordination also increase.

Studies of social networks' relationship to any outcome or household behavior suffer from serious identification problems stemming from the fact that households are not assigned to networks, but choose whether to join, choose whether to live in places where there are networks, and choose whether to form networks. Some unobservable aspects of a household's ability to invest in child health, such as income, access to formal credit, or preferences for child health or health knowledge, may be correlated with the household's ability to form and maintain networks. Moreover, measuring the size of the network that might influence nutritional investment is difficult. Some past studies have used neighborhood or ethnic group to proxy for the network (for example, Aizer and Currie, 2004; Bertrand et al., 2000), however, not all members of a neighborhood or ethnic group may influence a household's demand for health, introducing an errors-in-variables problem.

In this study, I overcome both the problem of self-selection into networks and of network measurement using data from Ugandan internally displaced persons (IDP) camps. In these camps, the size of a household's network has an exogenous component. The civil war that forced households into IDP camps significantly disrupted all aspects of families' lives, including whether they ended up living near the people with whom they had previously shared their lives.<sup>2</sup> Some households ended up with smaller local social networks for reasons out of their control. Because the civil war spread unpredictably over the region, households were forced to move to IDP camps at different times and under different circumstances. Villagers living in areas of heavy fighting moved to the camps first and were generally more likely to find space to build with friends and family. These households typically suffered less disruption to their networks. However, within months of the conflict's intensification, the military evacuated the remaining villages, giving households 48 h to move into camps. The chaos associated with such a large influx into the camps made coordination with friends and family virtually impossible. As a result, some part of the local network that a household was left with in the camp was exogenous to the households' preferences for social network size and its ability to make nutritional investments.

I also address the network measurement problem by collecting details about the size of households' farmers' groups, which are self-selected agricultural labor teams, before and after the displacement. As in many parts of Africa, Northern Ugandan farmers' groups play a critical role in defining and reinforcing household child-rearing behaviors and in supporting members in daily child care activities. Households share daily farm and household tasks, including meal preparation and child care, so members depend on each other to ensure income and for child health production. Group cohesion is based on reciprocity of labor and therefore demands long-term, trusting relationships. Given the financial and social significance of farmers' groups, households can easily recall in an interview the members of their farmers' group prior to displacement and where members lived during displacement. Therefore disruption to the farmers' group provides an easily-measured indicator of disruption to the networks that matter most to child outcomes. Moreover, while households did form new networks within the camps, quantitative and qualitative data collected for this study show that these networks were not

significant influences on household child-rearing behaviors in camps compared with networks established before displacement.

While initial variations in disruptions to households' social networks are exogenous to household preferences, some households may have been able to coordinate with pre-displacement farmers' group members during transition to live nearby in the camp. If the ability to coordinate is correlated with human capital preferences, then estimates of network size impacts based on an uninstrumented measure of network disruption may be biased. Moreover, some households may have relied more strongly on households that were not part of their farmers' group to support human capital investment. These network members would not be included in the network measure based on farmers' group disruption, presenting a potential errors-in-variables problem. Therefore, I use village-level fragmentation measures, which are unlikely to be correlated with households' human capital and network preferences, to instrument for the farmers' group disruption.

I infer variations in contributions to child health and nutrition from variations in children's height-for-age z-scores (HAZ). HAZ is a cumulative indicator of nutritional status and, for preschool-age children, is a function of lifetime dietary intake and morbidity, and genetics. Local network size can positively impact HAZ by increasing household contributions to nutrition and health. I find that an increase in local network size of one household (or roughly 25% of the average local network) leads to between a 0.06 and 0.22 standard deviation improvement in HAZ.<sup>3</sup>

## 2. Background: conflict and displacement in Uganda

This study was conducted in Lira and Pader Districts, Uganda, which are part of the ethnic Lango and Acholi sub-regions, respectively. At the time of the data collection, most residents in these districts were living in Internally Displaced Peoples (IDP) camps due to attacks by the rebel group, the Lord's Resistance Army (LRA) and fighting between the LRA and government forces, which intensified in these Districts in the early 2000s. IDP camps, unlike refugee camps, are government-run camps for the country's own residents and are not under the protection or control of the United Nations High Commissioner for Refugees.

The political agenda of the LRA, which began terrorizing districts to the west and north in the mid-late 1980s, are not clear (Gersony, 1997; International Crisis Group, 2004), which may explain the seemingly random nature of LRA attacks that has been documented in a number of recent sources (Blattman and Annan, 2010; Bøås and Hatløy, 2005; Lehrer, 2010; Nabudere, 2003). Until recently, LRA bases were held exclusively in Sudan and decentralized battalions would move throughout Acholiland. Battalions survived by ambushing and looting villages, and the decentralized nature of the movement meant that attacks were unanticipated and could occur simultaneously throughout the region. Attacks on Pader villages escalated in 2002. In October of 2002, the government forced all remaining Pader villages into camps with 48 h notice. In 2003, as the rebel army could no longer ambush Pader villages for supplies, they unexpectedly began to attack villages in Lira, driving these households into camps.

Conditions for health and nutrition production in Lira and Pader camps were poor throughout the conflict. Ugandan army restrictions and rebel threats limited movement outside the camps and hence

<sup>1</sup> This idea follows the literature showing that individuals may gain utility when their actions adhere to the ideal actions of their social groups (e.g. Akerlof and Kranton, 2000, 2002; Austen-Smith and Fryer, 2005; Bernheim, 1994). While the notion of restricted choice typically implies utility losses, and much of the peer effects literature focuses on negative aspects of adhering to peer group norms, restricting actions can improve long-run welfare in the presence of time-inconsistent preferences or coordination failures.

<sup>2</sup> Costa and Kahn (2007) employ a similar strategy by using exogenous disruptions to a preformed network to identify the effect of network size on survival in a POW camp.

<sup>3</sup> The nutrition literature has several studies showing that linear growth faltering occurs primarily in the first 3 years of life (Martorell, 1995; Shrimpton et al., 2001) and that growth lost in early childhood is only partially regained later in life if nutritional conditions improve (Martorell, 1995, 1999; Martorell et al., 1994; Simondon et al., 1998). Victora et al. (2008) provides a review of literature linking early childhood nutrition to adult outcomes. Several studies show malnourishment leads to lower likelihood of any education, delayed start to school for those who go, or fewer grades completed (e.g. Alderman, 2001; Alderman et al., 2006; Alderman et al., 2009; Glewwe and Jacoby, 1995, among others), which have clear implications for adult productivity.

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