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The Community Role of Schools in Jicamarca and Villa El Salvador (Peru): Crosscutting Behavior Settings in Personal Networks

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ABSTRACT

The personal networks of 138 parents of children participating in a child labor prevention initiative in three schools in Lima (Peru) are analyzed. First, relevant behavior settings in two informal population settlements in the periphery of the big city were detected. Second, the distribution of personal relationships in that small set of community contexts served to describe the everyday interaction in the neighborhood. Each interviewee provided information on the 45 persons with whom he/she interacts regularly, indicating in each case the context where that relationship preferably takes place. They also reported on the involvement of families in school and citizen participation initiatives in their community. The clustered graphs technique showed that the school is the second most relevant space for the development of interpersonal relationships in the neighborhood. Relationships among different family households were the most powerful predictor of community integration in the neighborhood of residence. The highest rates of child labor coincide with the most recently created community environments, with more fragmented personal networks, and with a less structured community as a whole. School is a community hub that facilitates interaction between the families of the neighborhood and connect to value resources outside of their usual place of residence.

El rol comunitario de las escuelas en Jicamarca y Villa El Salvador (Perú): sección transversal de configuraciones de comportamiento en las redes personales

RESUMEN

Se analizan las redes personales de 138 padres de niños que participaron en una iniciativa de prevención del trabajo infantil en tres escuelas de Lima (Perú). En primer lugar, se detectaron configuraciones de comportamientos relevantes en dos asentamientos informales de población en la periferia de la gran ciudad. En segundo lugar, la distribución de las relaciones personales en ese pequeño conjunto de contextos comunitarios sirvió para describir la interacción cotidiana en el vecindario. Cada entrevistador facilitó información sobre las 45 personas con las que interaccionaba habitualmente, indicando en cada caso el contexto en el que tenía lugar preferentemente dicha interacción. También informaron sobre la implicación de las familias en la escuela y de las iniciativas de participación ciudadana en su comunidad. La técnica de gráficos agrupados muestra que la escuela es el segundo espacio más importante en el desarrollo de relaciones interpersonales en el vecindario. Las relaciones entre diferentes familias vecinas constituían el mejor predictor de la integración comunitaria en el vecindario de residencia. Los mayores índices de trabajo infantil coinciden con los entornos comunitarios más recientemente creados y con una comunidad menos estructurada en conjunto. La escuela constituye un núcleo que facilita la interacción entre familias en el vecindario y conecta con los recursos de valores fuera de su lugar habitual de residencia.

Schools are institutions primarily designed to provide a space for teaching and learning. However, in practice they have multiple functions. Various social and cultural activities of the location regularly take place in schools (Oetting & Donnenmeyer, 1998; Simons, 2011; Valli, Stefanski, & Jacobson, 2014). Schools are also places of socialization for both children and families (Neal & Neal, 2012), and sometimes allow contact between groups of different social backgrounds (Nast & Bokland 2013). Schools also coordinate their day-to-day activities in cooperation with the social and health services of the community (Peters, 1994; Worton et al., 2014), and

are an ideal scenario for the implementation of preventive and promotion programs (Elias, Gager, & Leon, 1997; Neal & Neal, 2012; Pate et al., 2006; Story, Kaphingst, & French, 2006; Valli et al., 2014), in part because they provide wide-reaching access to the population and reduce accessibility problems (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Naylor & McKay, 2009). In addition, in the last years, schools have introduced various orientation programs and schools for parents (Dryfoos, 1995; Worton et al., 2014), among other services for the families and the community.

Schools are community hubs (Clandfield & Martell, 2010; Neal & Neal, 2012), where privileged behavioral settings of the community where they are located converge. In ecological psychology, behavioral settings refer to spatiotemporal contexts that are associated with a standing pattern of behavior (Barker, 1968). Over time this has led to the study of the contexts that produce predictable relationships between participants (or social regularities), which persist over time regardless of the individuals involved (Seidman, 1988, 1990). Educational institutions were among the first to be analyzed with the behavior settings approach, focusing, among other things, on the size of the school (Barker & Gump, 1964; Wicker, 1968), participation in extracurricular activities (Gump & Friedsen, 1964), and how spaces are defined physically (Moore, 1986). Classes, where formal lessons are taught, and playgrounds are the two key spaces that structure children's behavior in primary and pre-school (Kounin & Sherman, 1979), along with reading circles, gym, or music lessons (Moore, 1986). Although the concept of "behavioral setting" has not been very productive in later empirical research (Popov & Chompalov, 2012), the combination of stable patterns of behavior and dynamic social interaction with the identification of relevant community spaces make it a tool with enormous descriptive potential.

There are several types of spaces with similar function in the neighborhoods. For example, green zones allow social connection between neighbors and promote sports and recreational activities (Cilliers, Timmermans, Van den Goorbergh, & Slijkhuis, 2015). Community organizations have a mediating role in developing a sense of community (Hughey, Speer, & Peterson, 1999) and in empowering neighbors (Berger & Neuhaus, 1977). Cafés, hairdressers, or squares, among other "third places", are public spaces for meeting and informal conversation, which contribute to community integration (Oldenburg, 1989). Schools and workplaces consistently appear among spaces of sociability that emerge as conglomerates of relationships in personal networks (Maya-Jariego & Holgado, 2005, 2015). Each neighborhood offers different interaction opportunities based on urban design and existing community resources.

Residents develop relationships in these contexts depending on local circumstances, whether influenced by mere physical closeness or by interaction dynamics between people with similar characteristics (Neal & Neal, 2014). However, the use of spaces depends at least in part on the time they spend in the neighborhood. People with limited resources or less geographic mobility tend to have a more local lifestyle and less potential to integrate into broader and more diverse social structures (Chavis & Wandersman, 1990; Maya-Jariego & Holgado, 2015). In contrast, others who are more mobile spend only a small part of their time in residential settings and are more closely linked to the institutions in which they study or work (Chaix et al., 2013).

Previous research has focused mostly on structured, stable urban environments with some degree of community organization. Less attention has been given to developing residential contexts. In this study, we focus on three informal human settlements in suburban areas in Lima (Peru). These populations are at the periphery of the urban core often formed through irregular invasion of lands of public property. Low-income families from rural, often Andean environments usually carry out such an invasion. The resulting neighborhoods lack basic urban infrastructures (Meneses, 1998). The comparison of settlements that differ in their time of existence and the degree

of community structuring allows us to put in perspective the role of contexts for local interaction in the life of the neighborhood. In these areas in the periphery, especially in the initial stages, schools often depend on the villagers' own initiative. Eventually, schools are one of the first public facilities in neighborhoods that lack other services. This second case is more frequent in settlements with larger population and with more time of existence.

In this work, we assume that communities based on the locality (e.g., neighborhoods, districts) can be efficiently described through a selection of significant behavior settings and the relationships between them. To do this, we use a relational approach based on samples of personal networks in three specific communities to describe the patterns of relationships that occur among the most frequented places in each neighborhood, and pay particular attention to the role of schools in each case.

From Places to Relationships

Some places are relevant for the formation of relationships, which in turn can have an important impact on the care of children and on the prevention of child labor. The neighborhood may be regarded as an environment consisting of various behavioral settings where families exchange social support, develop a shared emotional connection, and establish links that contribute to the maintenance of social norms. Such type of interactions and shared experiences potentially promotes the sense of community and the flow of relevant resources for the care of children.

The family context is one of the key factors in predicting child labor. The size of the family is related to the specialization of its members: larger families usually decide that some of their children (sometimes depending on the child's birth order) should be involved in work activities (Patrinos & Psacharopoulos, 1997; Ravallion & Wodon, 2000). The general level of education in the family and the parents' schooling (the greater the level of education of the mother, the lower the chances that the children are engaged in labor activities) are also important (Emerson & Souza, 2007; Mukherjee & Das, 2008). Finally, the norms and values of families on child labor have a significant impact. Parents' attitudes can be favorable to early work experiences, which are considered opportunities for learning and knowledge of the environment (Kim & Zepeda, 2004). The responsibility to contribute income is also associated with respect for adults and may reflect an obligation of reciprocity towards parents.

So far, little is known on how families relate to each other and the consequent impact of such relationships on childcare and child labor. Relationships between families can influence the informational, social, and economic resources available to them to educate their children. They can also have an indirect impact on community cohesion and social control processes. Accordingly, this study aims to describe the relationships between families in the neighborhood's usual behavioral settings, and to explore the impact of relationships between families on child labor.

Study Area

The research was carried out in two public schools located in Villa El Salvador (VES) and a small school in the most recent sector of San Juan de Lurigancho (SJL). These two zones are separated by more than 40 kilometers of distance, both of them in the outskirts of the urban nucleus (Figure 1). VES is a district of the southern area of metropolitan Lima with about 543,000 inhabitants (Municipality of Villa El Salvador, 2014). Originating in the 70s, this zone was constituted as a self-organized community. The residents themselves, from rural inner Peru, built their houses and laid down the criteria of the main urban organization of the district. The Peruano Suizo School is located in the first sector of the urbanization Pachacamac, one of

the oldest sectors of VES, while the Max Uhle School is located in sector 2 of a more recent construction in Las Brisas de Pachacamac.

SJL, in the northeast of Lima, is the most populous district of Peru, with more than one million inhabitants (Censo Nacional de Población; Instituto Nacional de Estadística e Informática del Perú, 2013). The areas in the periphery of this district grew significantly during the 80s, coinciding with forced displacement due to political violence, at the time when the guerrilla of Sendero Luminoso was most active (Meneses, 1998). Jicamarca is a human settlement that has grown through successive waves of rural immigrants occupying undeveloped land. Nassae is a small privately run school, linked to the Peru's movement of working children, which is located in the most recent invasion hills. The area does not have water supply, electricity, sewage system, or paved road, amongst other deficiencies in basic urban infrastructure.

Both districts are representative of the exponential growth of the metropolitan area of Lima, which has multiplied by 9 its population since 1950 to become the fifth most populous city in Latin America (Thomas, 2014). These settlements have been formed with internal population displacement, whether forced by the armed conflict or as part of the migration from the countryside to the city (Meneses, 1998). However, the three community contexts differ in the duration of the settlement and, consequently, in the degree of structural urban development of the neighborhood (Holgado, Santolaya, Maya-Jariego, Cueto, & Anaya, 2015; Maya-Jariego, Aceituno, Santolaya, & Holgado, 2015). Specifically, they range from a self-managed community with more than forty years of existence (the community environment of the Peruano Suizo School in VES) to a human settlement of very recent occupation (the community environment of Nassae in Jicamarca). The Max Uhle School is in an intermediate position, although it shares more characteristics with the first school than with the second.
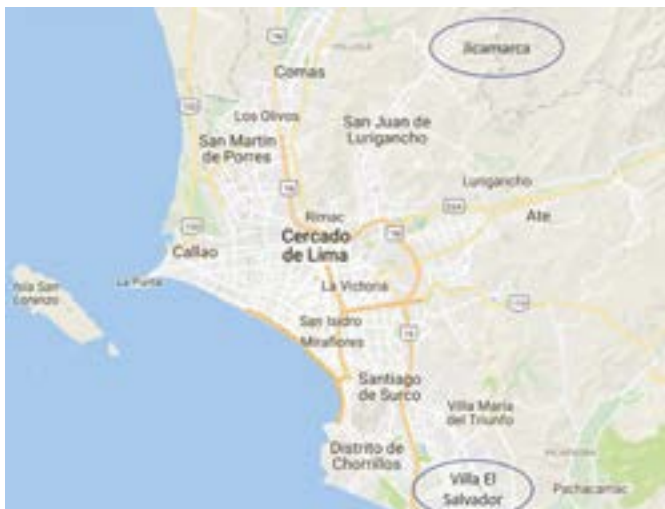

Figure 1. Villa El Salvador (SE) and Jicamarca (NE), in the Outskirts of Lima.

Method

Participants

We interviewed 138 parents or guardians of students in the Peruano Suizo (n = 61, 44.2%), Max Uhle (n = 58, 42%), and Nassae (n = 19, 13.8%) schools. The survey was addressed to all families of each participating child in a program for prevention of child labor, with a response rate of 95.4%. In each case, the father or mother was interviewed on behalf of the family group (in a few cases it was a

guardian). The interviews were voluntary, without any incentives, and were conducted face-to-face. Two facilitators of the program applied paper-and-pencil questionnaires, individually. Parent consent was obtained before completion of the questionnaire. The majority of the interviewees were women (n = 118, 85.5%), with a small number of males (n = 20, 14.5%), with a mean age of 38.1 years (SD = 9.04). The households of the interviewees are composed of 5.39 people on average (SD = 1.83), with an average income of 1,222.3 Peruvian soles (USD 373). There were no significant differences in the demographic variables and in the level of income between the three contexts studied.

The survey was conducted within/as part of the implementation of *Edúcame Primero Perú*, a program for the prevention of child labor. This program is an evidence-based practice that has been applied with positive results in several Latin American countries (Holgado, Maya-Jariego, Palacio, & Oviedo-Trespalacios, 2016; Holgado et al., 2014; Palacio, Sierra, & Aguilar, 2010). This type of intervention has been shown to be effective in improving academic performance, promoting the development of personal skills, and reducing the prevalence of child labor (Maya-Jariego, 2014; Maya-Jariego & Palacio, 2012, 2014).

The child participating in the *Edúcame Primero Perú* program (whether as an active participant or in comparison groups) is 10.38 years old on average (SD = 1.22), being mostly male (85, 61.6%). In total 57.6% of the children lived with the father and the mother, while 36.7% lived alone with the mother. The children attend 4th (67, 48.6%) and 5th grade (71, 51.4%), and most of them attend school regularly (129, 93.5%).

Instruments

Interviewees provided information on their personal networks, the involvement of the family at the school, social support in the neighborhood, the characteristics of the home, and the working conditions of their children if they performed any type of work activity.

Personal networks. To generate the personal network, the following question was asked: "Please give me a list of 45 people with whom you have a regular relationship throughout the week. I am interested in those people with whom you have a more frequent and regular contact. [They can be co-workers, neighbors, family, friends, people with whom you share hobbies, and so on. They can be from your neighborhood, from nearby neighborhoods or even from other districts. It's important that they are the 45 people with whom you have a more frequent relationship]." After obtaining the list of names, they were asked to indicate in which contexts they preferred to meet with their alteri in the neighborhood and the district. They also indicated the specific place in which they normally meet with them (for example, the school, home, or other parts of the neighborhood). The specific places were not suggested by the interviewer, but were pointed out spontaneously by the interviewees. For each pair of actors, they were asked to rate the relationship according to four levels: 0 = *they do not know each other, they have no relationship or no contact*, 1 = *they know each other*, 2 = *they have some relationship*, and 3 = *they have a strong relationship or are friends*.

The establishment of a fixed number of alteri is a procedure of study designed to facilitate inter-individual comparisons and data processing. It also serves to adequately represent the diversity of personal structures, since a minimum of 30 alteri is needed to obtain some variability in the structural indicators of the personal network (McCarty, 2002). This procedure has proved to be sufficiently valid and reliable in describing the structure of personal networks (Maya-Jariego, Florido, Holgado, & Hernández, 2016; McCarty, 2002). The resulting symmetric and valued matrices (45 x 45 actors) were processed, analyzed, and visualized with Ucinet 6 (Borgatti, Everett,

& Freeman, 2002) and Visone (Brandes & Wagner, 2004). The 138 personal networks each of 45 actors (990 edges) allowed us to analyze 6,210 alteri and 136,620 relations in total.

Involvement in school. We applied the Parent And School Survey (PASS) to evaluate the involvement of parents in school (Ringenberg, Funk, Mullen, Wilford, & Kramer, 2005). It is a 24-item instrument that measures the participation of parents in the education of their children. With a Likert scale (1 to 5), respondents rated collaboration with the school, communication with their children about educational issues, and the availability of resources for the education of children at home. For example, some of the items used are: "I attend activities at my child's school several times each semester", "I display my child's schoolwork in our home (e.g., hang papers on the refrigerator)", "I have made suggestions to my child's teachers about how to help my child learn." The reliability of the scale was alpha = .755.

Social support and community integration. The community social support questionnaire (Gracia, Musitu, & Herrero, 2002) is composed of 24 items that allow the assessment of relational integration with the community, community participation, social support in informal systems, and social support in formal systems. With a Likert type scale (from 1 to 5), respondents rated items such as: "I like my neighborhood", "I participate in the demonstrations and demands that are made in my neighborhood", "In my neighborhood I can find someone to listen to me when I feel bad", "[The services in my neighborhood] are an important source of help for me." A reliability of 0.834 was obtained.

Home characteristics and child labor. Parents or guardians indicated how many people live in their home. They also provided information on monthly income, educational level, and occupation of parents. Moreover, they reported on the conditions of child labor: the performance of paid activities by the child, reasons for working, how much time she/he works a week, days of the week she/he works, work hours, type of work activity, salary, and use of the salary to support the family.

With the above variables, we created two child labor rates. Relevance of child labor (RCL) is based on the existence of paid work by children, predisposition to work, and relevance of work for family income. Intensity of child labor (ICL) is based on the degree of dedication to work activities, the volume of time and type of work, and the space that work occupy in the child's life. Specifically, the RCL is a sum of the values in the following four variables: activity performed during the past week, wage work for an hour or more, intention to work soon, and importance of work for the family's livelihood; and the result is divided by the maximum possible value, to obtain a score as a percentage of the total. With the same calculation procedure, ICL is based on the following variables: number of days worked per week, number of weekdays worked, number of days worked in the weekend, work shift, place of work, and permanent or temporary nature of the work activity.

With these two indicators, we value both the performance of work activities and the conditions in which they are performed. First, the RCL indicator is based on the traditional approach, which takes into account the participation of children in wage-earning activities that can potentially have an impact on their personal and educational development. Second, the ICL indicator takes into account working conditions, such as the number of hours or the coincidence of work activity with school hours, so as to assess whether they have a negative impact on academic performance or personal opportunities (Edmons, 2008; Holgado et al., 2014).

Procedure

In order to compare the structure and composition of personal networks, we performed exploratory analyses with aggregate indicators of centrality and cohesion measures, following indications by McCarty (2002). Among others, we used indicators of degree, betweenness, closeness, degree centralization, betweenness centralization, number of cliques, number of components, density, E-I index, and IQV index. Finally, we opted for the three indicators that according to the correlation table best discriminated cohesion, fragmentation, and integration dimensions of the network (Lozares, Martí, Molina, & García-Macías, 2013; Maya-Jariego & Holgado, 2015), namely, density, number of components, and number of cliques respectively. The three previous factors have been found to be consistent in studies that have performed a factorial analysis of the main indicators of centrality and cohesion in personal networks.

In order to describe the structure of the relations between the different places of interaction in the neighborhood, we used the technique of clustered graphs (Brandes, Lerner, Lubbers, McCarty, & Molina, 2008; García-Macías, 2013; Maya-Jariego, Holgado, & Florido, 2016; Molina, Lerner, & Gómez, 2008), aggregating the information according to the three schools studied. This technique allows a visual representation of networks in which a grouping of the vertices occurs (Brandes et al., 2008). The list of places in which each respondent is most likely to relate to each alter was summarized in 7 main places of interaction: the house of ego, other houses in the neighborhood, school, workplace, market, church, and contacts through phone. Specifically, we rely on the weighting of edges to compare intra-class and inter-class ties (Brandes et al., 2008). This technique consists of classifying the nodes according to a group or category of membership, which allows differentiating between the links that occur within the group (intra-category) or between groups (inter-categories) (for a detailed description, see Brandes et al., 2008).

Atypical values were eliminated to avoid a bias in the representation. Specifically, two cases of those interviewed in Jicamarca were eliminated in which the number of cliques increased the mean and the standard deviation. In the meta-representation of Max Uhle we eliminated the weight of one Market-Telephone relationship, which made the relative weight of the other relations non visible. The exclusion of a case from the sample of personal networks was only carried out for graphic representation purposes in one graph. The tests were developed with the data of all the respondents.

Results

Mothers almost daily meet other mothers when they go to school to take or pick up their children. They also meet, more occasionally, when they participate in parent schools, or in orientation and tutoring sessions with teachers. Occasionally, schools organize parties or sport activities in which families are involved. However, this relationship of families with the educational institution is different in each school. For example, during the implementation of the program *Edúcame Primero Perú* we verified that at the entrance of the Peruano Suizo School talking shops of mothers are formed, both at the door and at nearby food stalls. However, in Jicamarca children arrive intermittently and there are hardly any conversations between mothers at the school entrance. Some of the most prominent behavior settings are summarized in Table 1. To examine such differences in a systematic way, we used the analysis of personal networks, and compared the different contexts of interaction in each neighborhood.

Each school hosts several behavior settings in which families can relate to each other. School is a context that has served many mothers to initiate relations with their neighbors and, over time, to exchange mutual help in the care of the children. It is also a place of contact with teachers, who come from other areas of Lima, who provide novel information and sometimes act as brokers for resources located outside the district. Furthermore, given it is a relevant context for sociability, we expect the school to be connected with other key places in the neighborhood.

Table 1. Behavior Settings in Three Schools of Jicamarca and VES

Behavior setting	Description	Implications	Schools
School entrance	Mothers (and in some cases fathers) meet at the door of the school when taking or picking up their children, and they chat for a while.	Mothers briefly exchange information about the school or neighborhood. It is a context of exchange of instrumental support between families (e.g. a mother may ask another to pick up her child to stay at home in the afternoon until she arrives from work).	This is especially significant in the case of the Peruano Suizo.
Parties and school activities for families	There is a sports activity or a celebration in the school, in which the parents participate.	Usually it serves to involve families in school, and promotes shared emotional connection. Sometimes, it is used as a crowdfunding strategy.	This is especially significant in the case of Nassae.
Orientation and tutoring sessions with teachers and principals	The teacher or principal maintains individual tutoring with the mother or father, exchanging information about her/his child's case and the educational activities of the school.	These meetings serve to provide information about the school, and improve school-family connections. Teachers can provide advice and guidance on existing resources in institutions and outside the neighborhood.	These sessions are carried out with frequency; however, they are not regular, in the three schools. In part, they operate at the request of specific families.
School of parents	A psychologist, teacher or volunteer meets with parents of students to train them in communication styles, child development, conflict management, and other issues relevant to child care.	It provides positive role models and serves to share experiences among families. Social networks are developed among families.	They are carried out from time to time in all three schools, but without regularity. They are usually part of external projects.

Structure of Relations in Three Neighborhoods of Lima

Personal networks show an eminent local composition, in which two-thirds of the relationships preferably take place in the same neighborhood as the interviewees (Table 2). The most common places of interaction in the neighborhood are the home of ego or alter (15.62%), school (6.51%), market (5.88%), and church (2.61%).

The workplace is one of the spaces that contribute to the geographical diversity of personal networks. As well, there is a 6.44% of alteri with whom the preferred communication does not occur face to face, but through telephone, internet, and other digital media, especially, through WhatsApp and Facebook.

The school is the second most important interaction context in the neighborhood, although with small differences observed between the three geographic areas studied. In Jicamarca, the school has a greater relative importance when compared with the other three. Indeed, the market, the church, and other homes in the neighborhood have less weight as a setting for the development of relations between neighbors. In addition, residents in Jicamarca are the ones that have more relationships outside the neighborhood. The workplace, usually outside the district where they reside, also has comparatively more weight as a place for the formation of relationships.

The analysis of clustered graphs was applied first to all the respondents and secondly to the subsamples of each school. The resulting meta-representations reflect the structure of the relationships between the different contexts in which the individual moves, as well as the internal density of relationships in each of them (Figure 2). The interviewee's home is the most centralized space around which the personal network is largely structured (Figure 2, left). For all the participants, ego's household has a centrality of 25.92, compared with other locations that range from 6 (in the case of the church) and 16.39 (the school).

However, the school also has a prominent role. Specifically, it is the second best connected context, showing the highest density of intra-class relationships. It is especially well connected with the relationships that the interviewees have at home and in the workplace. This means that the school is not only characterized as a space interconnected with other neighborhood settings but also the relationships developed in it are linked to the outside, especially with contacts in the workplace. On the other hand, the relationships

Table 2. Places of Interaction. Percentage of Each Place according to the Total Frequency of All Categories

| Place where the relationship usually takes place	Three Schools f	Three Schools %	Peruano Suizo f	Peruano Suizo %	Max Uhle f	Max Uhle %	Nassae f	Nassae %
Neighborhood of residence of ego	4,219	67.94	1,913	67.48	1,763	69.96	542	63.39
Household of ego	642	10.34	282	9.95	299	11.87	61	7.13
School	404	6.51	172	6.07	177	7.02	55	6.43
Market	365	5.88	209	7.37	113	4.48	43	5.03
Other households of the neighborhood	328	5.28	179	6.31	106	4.21	43	5.03
Church	162	2.61	78	2.75	72	2.86	12	1.40
Another place in the neighborhood	2,318	37.33	993	35.03	996	39.52	328	38.36
Different neighborhood	1,538	24.77	655	23.10	609	24.16	246	28.77
Workplace	204	3.29	85	2.99	91	3.61	28	3.27
Alternative contexts	453	7.29	267	9.42	148	5.87	38	4.44
Phone/online	400	6.44	239	8.43	133	5.28	28	3.27
Others	53	0.85	28	0.99	15	0.59	10	1.17
TOTAL	6,210	100	2,835	100	2,520	100	855	100
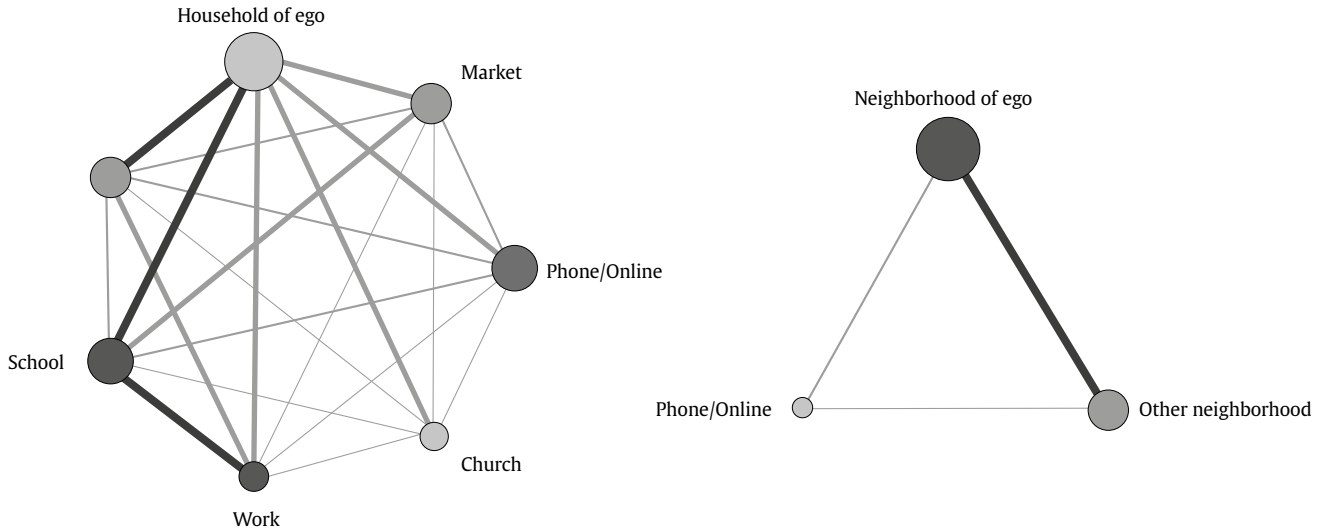
Figure 2. Distribution of Personal Relationships in the Behavioral Settings of Three Neighborhoods in the Periphery of Lima.

that mothers and fathers have in school are more intertwined (that is, they are denser) than in the other frequented contexts of interaction. It also has moderate indicators of transitivity (.44 in Peruano Suizo, .62 in Max Uhle, and .70 in Nassae).

The second meta-representation, more simplified, groups the different settings into three categories: relationships within the neighborhood, relationships outside the neighborhood, and contacts that are maintained by telephone (Figure 2, right). Both the intra-class relationships and those between categories correspond to a core-periphery structure, with successive concentric circles from the neighborhood, to out-of-neighborhood relationships, and telephone contacts. The nucleus, that is to say, the relations that the interviewee has in the neighborhood, is the one that shows greater internal

connection and also greater connection with the other two categories of relations.

We repeat the analysis for each context (Figure 3). The community environment of the Peruano Suizo School is the one that shows a more articulated network of places. The graphs of Max Uhle and Nassae show successively a lower density. However, in all three cases the school has a prominent role, and is among the three contexts of the neighborhood with greater centrality. Let us look at each case separately.

The relations that the interviewees have in the Peruano Suizo School are usually well connected inside and outside the neighborhood. The relations of the school are highly intertwined with each other – they have a high internal density – and form an
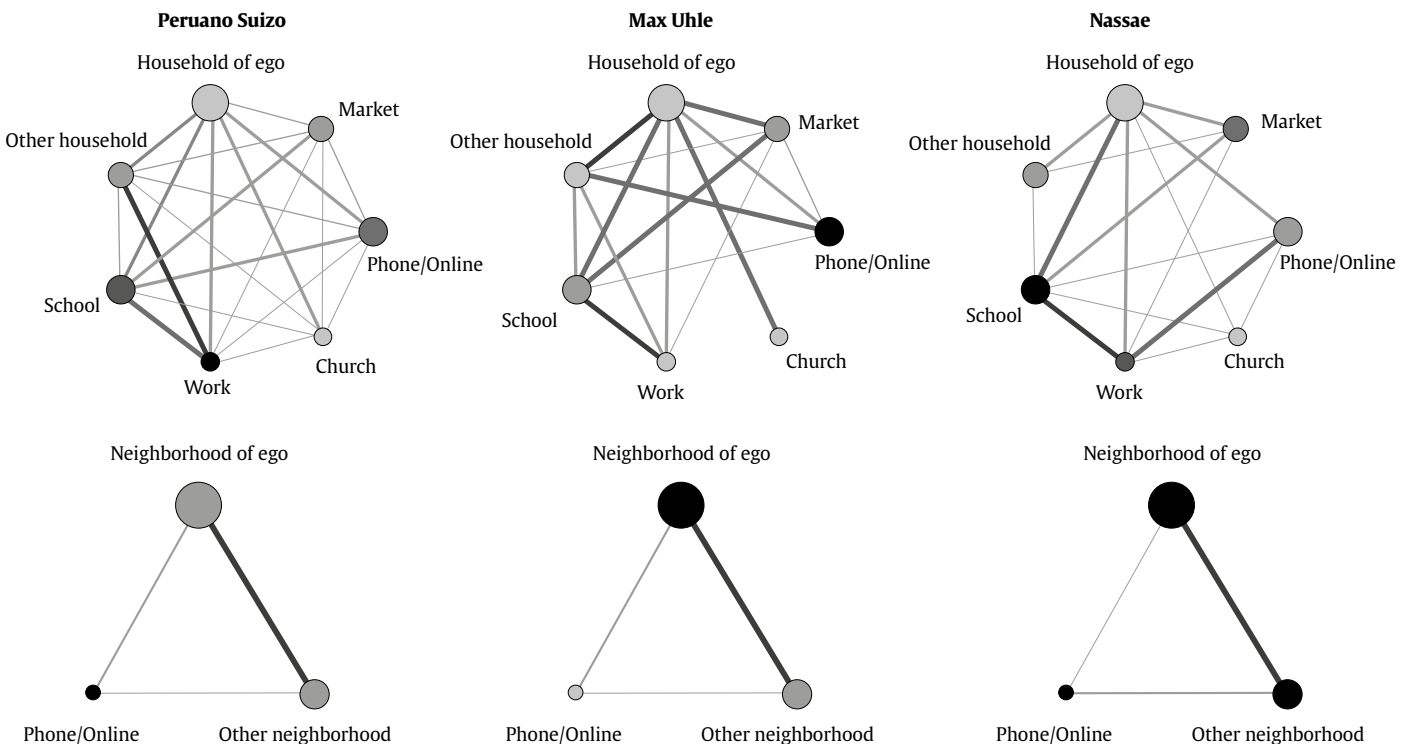

Figure 3. Distribution of Personal Relationships in the Behavioral Settings of the Community Environments of the Peruano Suizo, Max Uhle, and Nassae Schools.

axis of sociability both with the families' homes and with the work environment, usually outside the neighborhood.

Relations in Max Uhle seem more localized, centered in the neighborhood, with links of relationship between neighborhood families, the contacts in the market and the school. Otherwise, the structure has many parallels with those of the Peruano Suizo.

Nassae is the most distant scenario from the general description. The school emerges as an important place for interaction in a less structured community context. Jicamarca is a human settlement in which residents make a living normally outside the neighborhood. Accordingly, the relations of the school are highly connected outside the neighborhood, in the labor arena. In this case, telephone contacts are also more significantly associated with the space of sociability outside the neighborhood.

The simplified representations confirm that (Figure 3, lower section) Jicamarca is the context in which relationships outside the neighborhood are denser internally and are better connected in inter-class ties. It is also the only case in which telephone contacts are more connected with relationships outside the neighborhood.

Networks, Communities, and Child Labor

Most parents interviewed indicated that their children spent most of the week studying ($n = 129$, 93.4%). However, we identified 21 children (15.21%) who did "some kind of paid work for one hour or more last week". This is a group of child workers and/or at risk of child labor.

Within this group, the type and degree of involvement in work activities are very diverse. Of the 21 children who performed paid work the previous week, 71.4% ($n = 15$) indicated that the work was temporary, and in 81% of the cases ($n = 17$) it was a job done at home or as part of a family business. From the total of interviewees, we identified 6 children (4.35%) who work permanently, in almost all cases, outside the family nucleus.

Taking as a reference the 21 children who did some type of paid activity the previous week, the average time of dedication to these labor activities is 2.79 days a week, 0.70 hours a day, and 4.89 hours a week. Preferred days of work are usually on weekends (Friday: 76.2%, $n = 16$, Saturdays: 81.0% , $n = 17$, and Sundays: 71.4%, $n = 15$). On the other days of the week, this percentage drops slightly, standing around 60% on almost every day. The work is mainly done in the afternoon (52.4%, $n = 11$), rather than in the morning (23.8%, $n = 5$).

Indices of relevance and intensity of child labor show some differences between the three contexts analyzed (Table 3). Specifically, Jicamarca shows the highest prevalence of child labor (21.1%), as well as working schedules and conditions that are most disruptive to school attendance (ITI = 19.85). On the other hand, the lowest percentage of working children (12.1%) is found in the Max Uhle community, although the contribution of child labor to families (RCL = 10.46) is significantly higher. Regarding comparisons by

gender, the degree of dedication or intensity of girls is much higher than that of boys (ICL = 16.29 versus 11.67, $F = 10.58$, $p < .01$).

The neighborhoods show equivalent indicators in the involvement of the parents in the school and in the degree of community integration, considering the scales as a whole. However, the analysis by specific items shows that residents in the Peruano Suizo School environment participate more actively in neighborhood initiatives and perceive more support available from neighbors. Specifically, they participate significantly more in sports and cultural groups of the neighborhood ($F_{2, 133} = 3.648$, $p < .05$), and in leisure activities ($F_{2, 133} = 3.648$, $p < .05$), and more frequently attend neighborhood manifestations ($F_{2, 133} = 3.580$, $p < .05$). They perceive that in their neighborhood there are people who can help them solve their problems ($F_{2, 133} = 3.096$, $p < .05$), who help them feel happy ($F_{2, 133} = 3,801$, $p < .05$), and who listen to them ($F_{2, 133} = 3.956$, $p < .05$) or cheer them up ($F_{2, 133} = 2.956$, $p = .5$) when they feel bad. This description reflects the district of Villa El Salvador, a district with a greater tradition for improving the neighborhoods situation and the community self-organization. In addition, it is a comparatively more settled community context, which has allowed the development of personal relationships between neighbors.

On the other hand, the residents in Jicamarca show some particularity in their relation with the school. For example, parents are less likely to read their children daily ($F_{2, 133} = 7.545$, $p < .01$). In addition, the personal networks of the interviewees in Jicamarca show almost twice as many cliques as in the other two community contexts ($F_{2, 129} = 3.448$, $p < .05$). Finally, the family household intra-class weights are significantly higher in Nassae than in Max Uhle and Peruano Suizo ($F_{2,94} = 10.632$, $p < .01$).

Taken together, all these comparisons indicate that the most marked differences are observed between the oldest and consolidated neighborhood around Peruano Suizo and the most recent and less organized human settlement in Jicamarca[1].

Regression Models: Structure of Neighborhood Relationships and Community Integration

First, we explore the relationships between the set of variables considered in the previous descriptive analysis. Bivariate correlations showed a positive association between community integration and some properties of the relationships structure in the neighborhood. Specifically, the scale of community integration correlates significantly with the intra-role weight of contacts in another household in the neighborhood ($r = .469$, $p < .05$), the intra-role weight of telephone contacts ($r = .386$, $p < .01$), and the weight of the relationships between the ego home and another neighborhood home ($r = .558$, $p < .01$). It is also positively associated with the mean of the scale of involvement at school ($r = .375$, $p < .01$).

Next, we examine the association between the relationship structure in the neighborhood and community integration.

Table 3. Indicators of Personal Networks, Community Engagement and Child Labor

	Total		Peruano Suizo		Max Uhle		NASSAE	
	M	*DT*	*M*	*DT*	*M*	*DT*	*M*	*DT*
Personal networks								
Density	0.534	0.204	0.514	0.202	0.566	0.216	0.511	0.168
Cliques	42.86	135.24	26.12	24.28	24.85	22.16	41.94	29.45
Components	1.36	0.89	1.43	0.83	1.21	0.49	1.53	1.65
Community								
Engagement in school	2.99	0.67	3.01	0.64	2.98	0.73	2.95	0.57
Community integration	3.14	0.71	3.28	0.58	3.07	0.77	2.87	0.83
Child labor								
Relevance of child labor	8.74	15.25	7.08	13.43	10.46	17.71	8.57	11.95
Intensity of child labor	13.51	16.20	12.66	15.51	12.30	16.19	19.85	17.61

In Table 4, we summarize the results of the multiple regression model. The Durbin-Watson index yielded a value of 1,274, with acceptable levels to assume the absence of multicollinearity among the model variables. Both the density of relationships between neighborhood households ($B = 0.210$, $p < .01$) and the connectivity between the household and other households in the neighborhood ($B = 0.133$, $p < .01$) are associated with higher levels of community integration. Both indicators refer to relationships between families as a key element in the provision of support and the shared emotional connection in the neighborhood of residence. On the other hand, having a set of ties that are usually contacted by telephone, densely connected to each other, is a negative predictor of community integration ($B = -0.109$, $p < .01$). Income was not included in the model[2].

Table 4. Regression Model of the Structure of Relationships as a Predictor of Community Integration

	B	SE B	β
Other households (intra-class)	0.210	0.064	.622*
Phone contacts (intra-class)	-0.109	0.036	.583*
Relations between household of ego and other households	0.133	0.042	.565*
R^2		0.659	

* $p < 05$.

In an exploratory way, we finally examine the association of these antecedents with the fact that the children work. First, we verify the associations of relationship structure, school involvement, and community integration variables with the indicators of relevance and intensity of child labor. The index of relevance of child labor correlates significantly with the number of components in the personal network ($r = .216$, $p < .05$), with the intra-class weight of contacts in the market ($r = .303$, $p < .05$), with the intra-class weight of the telephone contacts ($r = .292$, $p < .05$) and with the weight of the home-market relation ($r = .458$, $p < .01$). For its part, the composite index of intensity and relevance of child labor (generated from the sum of both) correlates negatively with the transitivity of telephone contacts ($r = -.309$, $p < .05$).

To describe the dimensions that distinguish the group of working children from the rest, we carried out a discriminant function analysis. The groups were defined according to how respondents replied to the question about whether they performed "some kind of work under payment for an hour or more last week". A significant discriminant function was found, with a canonical correlation of .795 (chi-square = 17.994, $p < .0001$). The variables that most effectively distinguished both groups were the intra-class weight of telephone contacts (with a standardized coefficient of 1.003) and intra-class weight of contacts in the market (with -0.011).

Discussion

The school is the second most significant context of interaction in the neighborhoods studied. It is a space in which relationships with other families begin, providing opportunities for interaction that are reflected in comparatively high indicators of density and transitivity. This makes the school generally well connected with other behavior settings in each neighborhood. In addition, it is a space in which the relations are linked with the outside, mostly with other labor contacts. Therefore, the school seems to contribute bonding and bridging social capital simultaneously. This combination of social resources is relevant from an academic, psychological, and community point of view (Virtanen, Ervasti, Oksanen, Kivimäki, & Vahtera, 2013).

The density between the different spaces of sociability is smaller in more recent settlements, or in which the geographical mobility of the residents to other parts of Lima is more usual. At one end, the Jicamarca settlement has a network of poorly articulated places

and displays a significant part of its social relations outside the neighborhood, and the school – which emerges as one of the few community spaces – is especially well connected with resources from outside. Possibly, a part of them may be relations that school principals have in other districts of Lima. At the other end, the environment of Peruano Suizo, despite having lost part of the original impulse, still maintains some of the characteristics of what was considered the first self-organized villa in Latin America. It is a community space with comparatively higher levels of participation, in which residents also perceive a greater availability of affective support from neighbors. Residential stability and opportunities to develop relationships over time contribute to psychological sense of community and citizen participation (Perkins & Long, 2002).

In the three cases, these are neighborhoods arising from informal occupation of land by a moving population, and not from previous urban planning. This has resulted in residential environments with major deficiencies in services and basic infrastructure, consisting of homes built with temporary materials (such as boards, brass, and adobe). Concurrently, residents have previous informal relationships (especially when they share the same rural or Andean origin), which enable them to initiate local self-organization initiatives and deploy actions to claim urban services to the municipality. Despite the lack of the most basic resources, previous neighborhood participation, incipient social networks, the emergence of community leaders, and capacity of endurance are among the resources that can contribute to community resilience (Wandersman & Nation, 1998).

In this paper, we have explored the relationship between the interaction contexts of families at local level and the involvement of children in work activities. The rate of child labor in Peru is around 25%, while in the Lima region it reaches 7% (Ministerio de Trabajo y Promoción del Empleo, 2015). In Jicamarca and Villa El Salvador, the rate is below the national average, but doubles (and in some cases triples) the regional average. The highest rate occurs in the most recent settlement, coinciding with the less structured community environment. Relationships between families constitute a core of key sociability in structured communities, where neighbors exchange support and perceive a shared emotional connection. The prevalence of child labor and its most disruptive forms seem to be associated with more fragmented networks, in which we observed a lower link between households and the emergence of alternative spaces for the relationship in the neighborhood (e.g., the market and contacts by phone). It would be interesting to explore in future research the relationship between the duration of the population settlement or levels of community organization and child labor. Somehow, it seems that a network of well-connected families is, at community level, a preventive factor for child labor. This could be related to the opportunities to exercise control over the schooling of children by the community (Ersado, 2005). Complementarily, social stimulation, positive role models, and social support that flow in the networks in which parent-child interaction is embedded have a direct influence in child development (Cochran & Brassard, 1979).

The type of geographical mobility between different districts in a mega-city, such as Lima, is one of the factors that could have a great impact on the structuring of personal networks. In another context, we have observed that the frequency of intercity journeys is associated with personal networks with a lower structural cohesion (Maya-Jariego & Holgado, 2015). The daily geographical mobility between districts by families living in the outskirts of Lima is largely conditioned by the work activity of parents. It also seems to be forced by the lack of local resources and opportunities, as is especially the case in Jicamarca. The majority of people living in the suburbs work in the center of Lima or in the industrial zones of the city – far from their neighborhood of residence – spending on average between two and three hours commuting (Meneses, 1998).

In the suburbs of Lima we have observed that schools have two functions in terms of interaction. On the one hand, the school is a

place where relations between parents (by extension, relationships between families) are produced, with a significant role in the exchanges of support and information in the immediate local reality. On the other hand, the school is a context in which external resources of value are sometimes obtained, hence becoming a medium of leverage and integration in the social structure. A school becomes a specific behavior setting, more or less relevant, in the life of the neighborhood depending on the combination of the above-mentioned functions.

In this study the selection of key community contexts was limited to the preferred place of interaction with each alter. In this way, we combine the detection of the typical patterns of interpersonal interaction with a census of the key places for social encounters in the neighborhood. The contribution of this approach is that we can examine the overall structure by exploring how physical environments are connected through social relations, and vice versa. The combination of personal network analysis with previous exploratory ethnographic work could improve the description of behavioral settings (Georgiu, Carspecken, & Willems, 1996). In this case we have focused on the relational uses of space. It would also be of interest to look in depth in the diversity of social behaviors that take place in each context of interaction (Schoggen, 1989).

The first studies on school behavior settings focused on the classroom and the playground as preferred contexts of interaction between students and their teachers (Kounin & Sherman, 1979; Moore, 1986). In this case, we have shown how schools offer opportunities for direct interaction between parents, constituting a center of reference for the community. Parents stop to chat at the entrance of the school, meet at school parties or have formal meetings with school's tutors. Each of these scenarios is an opportunity for exchange of resources inside and outside the neighborhood. These informal gathering places have a far-reaching community impact.

Limitations

A case study was conducted with an eminently inductive approach. The description of relationships and contexts was based on families participating in a psychoeducational program. The sample of personal networks corresponds to a defined social space in which there may be some overlapping of relationships and some measurement biases (Holland & Leinhardt, 1973). The recruitment of participants was done through the school, so it is expected to appear as a space of interaction relevant to respondents. Although participant observation of the settlements of Jicamarca and Villa El Salvador, with more than two years of program implementation, allowed us to verify the centrality of school in neighborhood's life, it would be of interest to carry out comparative studies with greater variability between participants, as well as mechanisms of control of variability between contexts. The discriminant function, incorporated with an exploratory value, corresponds to a small group of cases, and it would be of interest to be tested again later. Compared to Villa El Salvador, Jicamarca is a more recent settlement, with less infrastructure and a lower level of community organization. In the future, it would be interesting to compare systematically the diversity of settlements on the periphery of Lima.

Despite previous limitations, our study makes a contribution to the understanding of the relationships between families in marginal settlements and the role of schools in facilitating such relationships.

Conclusions

With this research, we describe the personal networks of parents residing in three settlements on the outskirts of Lima,

exploring in depth the contexts in which interaction takes place. The neighborhoods studied are not the result of formal urban planning but informal settlements of the population moving from inner Peru. The case study of participants in the *Edúcame Primero Peru* program allowed us to make some observations of interest:

- Relationships between families in a neighborhood are key to community integration and social cohesion. In particular, the exchange of support between mothers as well as mechanisms of social control derived from mutual knowledge and shared emotional connection, could have an educational value, with a preventive impact on child labor.
- The school is one of the preferred settings for the development of relationships between families in the neighborhood. Each school provides various behavior settings that facilitate the development of interpersonal relationships, the maintenance of regular interactions and the exchange of social support.
- Personal network analysis can be a complementary tool in describing behavior settings. In this study, we have illustrated how the structure of relationships between the most significant contexts in each neighborhood can be depicted through networks.

Conflict of Interest

The authors of this article declare no conflict of interest.

Notes

[1]In post-hoc Scheffé comparisons, respondents of both schools differed in participation in cultural and sports activities (Peruano Suizo, $M = 3.48$, $DT = 1.76$; Nassae, $M = 2.42$, $DT = 1.84$), participation in leisure activities (Peruano Suizo, $M = 3.72$, $DT = 1.72$; Nassae, $M = 2.53$, $DT = 1.80$), neighborhood demonstrations (Peruano Suizo, $M = 3.65$, $DT = 1.74$; Nassae, $M = 2.47$, $DT = 1.81$), in help from neighbors to solve problems (Peruano Suizo, $M = 3.50$, $DT = 1.67$; Nassae, $M = 2.42$, $DT = 1.54$), neighbors contributing to happiness (Peruano Suizo, $M = 3.63$, $DT = 1.29$; Nassae, $M = 2.68$, $DT = 1.36$), neighbors who listen when you feel bad (Peruano Suizo, $M = 3.63$, $DT = 1.27$; Nassae, $M = 2.63$, $DT = 1.46$), neighbors who cheer you up when you feel bad (Peruano Suizo, $M = 3.45$, $DT = 1.31$; Nassae, $M = 2.79$, $DT = 1.51$), reading regularly to your children (Peruano Suizo, $M = 3.60$, $DT = 1.49$; Nassae, $M = 2.10$, $DT = 1.45$), and number of cliques (Peruano Suizo, $M = 26.12$, $DT = 24.28$; Nassae, $M = 41.94$, $DT = 29.45$).

[2]Previous research demonstrates that child labor is closely linked to poverty. Family income is the most significant and recurrent factor in the literature on causes of child labor. In our data, income was slightly negatively correlated with the index of relevance of child labor (RCL) ($r = -.217$, $p < .05$). However, income was not a significant predictor of community integration ($B = 0.154$, $p = .479$). In fact, it would lower the R of the model if incorporated in the resulting final regression in Table 4 (from .659 to .639).

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