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CULTURAL DIFFERENCES IN CHILDREN’S COLLABORATIVE PROCESSES

A dissertation submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

By

Lucía Alcalá

June 2014

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Cultural Differences in Children’s Collaborative Processes

By Lucía Alcalá

Abstract

This study examined cultural differences in children’s collaborative processes and explored the relationship between these collaborative processes and the children’s collaboration in household work. 30 6- to 10-year-old sibling pairs from Mexican-heritage and middle-class European-heritage backgrounds participated in the study. Home visits were conducted using a planning task where dyads planned five grocery-shopping trips using a model store, first creating individual plans and then working together to create a combined plan. After participants completed their individual plans, the research assistant asked them to work together and help each other to make the shortest route to pick up all the items on their shopping list. Using 10-second segments, data were coded in four main categories; fluid ensemble, coming to agreement, one child leads activity, or dividing separate roles (which had several subcategories). Mexican Indigenous-heritage siblings collaborated as an ensemble in a higher proportion of segments than middle-class European-heritage siblings, who spent more segments dividing roles. Specifically, when European-heritage pairs were dividing roles they spent a higher proportion of segments being bossy to their sibling with the sibling implementing their plan, and ignoring their sibling while working on the plan. There was a positive relationship between siblings’ collaboration at home and collaboration in the planning task. Siblings who were reported to collaborate with initiative in household work, based on mothers’ reports, were more likely to collaborate as fluid ensemble with their sibling in the planning task. In contrast,
children that were reported to do household work only when adults managed their
chores were more likely to collaborate by being bossy to their sibling or by ignoring
their sibling while working on the plan. Findings may help us better understand how
cultural practices contribute to children’s tendencies to collaborate with others in
different contexts, including in the classroom setting where collaboration might be
discouraged or managed by adults.
Dedication and Acknowledgements

I want to dedicate this dissertation to all the people who have helped me in so many different ways throughout these years.

To my family, Mamá, Papá, hermanas, y hermanos que me apoyaron en cada paso y respetaron mis decisiones. Gracias a los sacrificios y esfuerzos de mis papas, hoy puedo decirles que valió la pena… su esfuerzos no fueron en bano.

To my little family, mis tres tesoros, mi adorado Alex, y mis adoradas Marianita e Isabella! You have taught me more than books and conferences. Your smile gave me the strength I needed during the most difficult and crucial moments. Your hugs provided me with the peace I needed during the darkest days of my graduate experience. I couldn’t wait to go home after a long day of work to see your smile… you changed my life and gave it meaning… I love you with all my heart and I apologize for those moments when I was not the mom you deserved and needed. I’m sorry! But I want you to know that everything I do, I do it for you, so you can have a better life! Los amo mis niños… mas de lo que se puedan imaginar y mas de lo que les pueda decir con palabras, por eso se los demostraré con hechos…

A el amor de mi vida mi esposo, Elias Alcala. Esto no hubiera sido posible sin tu amor y apoyo incondicional. Te amo igual o mas que cuando te conocí… eres mi todo! Gracias por creer en mi y por estar siempre firme en nuestra familia a cada momento. Te amo con todo mi ser y te admiro por la gran persona que eres, admiro tu etica de trabajo y tu dedicación a la familia. Te amo mi Elias!

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Esto fue un esfuerzo en comunidad, y a mi comunidad se lo dedico con cariño y respeto,

Lucía
Cultural Differences in Children’s Collaborative Processes

This study examined cultural differences in children’s collaborative processes in a planning task and its relationship with household collaboration and with cultural values regarding collaboration. Specifically, the study examined whether Mexican-heritage sibling pairs worked together as a fluid ensemble in a planning task more than European-heritage pairs, or divided their roles to work individually. As a secondary analysis, this study explores the relationship between children’s initiative in collaborating at home and their collaboration in the planning task. (To my knowledge, only one other study has looked at the collaborative processes of the same participants in two different settings, Lopez & Rogoff, in preparation). I speculate that across backgrounds, children who worked as a fluid ensemble with their sibling are likely to be reported to collaborate with initiative in household work.

Sociocultural research suggests that children’s opportunities to participate in everyday activities at home and in their community may provide children with experience and support that is beneficial for their development (Gauvain, 1999; Paradise, 2005; Rogoff, 1990; 2003). Children’s contributions to activities of their family and communities may relate to their development of prosocial approaches, including collaboration (López, Rogoff, 2011; Rogoff, Paradise, Mejia-Arauz, Correa-Chávez, & Angelillo, 2003; Rogoff, Moore, Najafî, Dexter, Correa-Chávez, & Solís, 2007). Children in some Mexican-heritage communities contribute extensively and with initiative to family household work and often take the initiative to plan their own after school activities (Alcalá, Rogoff, Mejia-Arauz, Coppens, & Dexter 2014; Gaskins, 2001; Orellana, 2003; Ramírez-Sánchez, 2007).
The National Research Council calls collaboration one of the 21st century skills, along with critical thinking, problem solving, effective communication, motivation, persistence and learning to learn, necessary for children’s development in our changing economy (Pellegrino & Hilton, 2013). The cognitive developmental literature suggests that collaboration shapes children’s learning (For reviews see Bos, 1937 as cited in Matusov, Bell, & Rogoff, 2002; Faucett & Garton, 2005; Souvignier & Kronenberger, 2007). However, the literature indicates that collaboration is not easy for children. A few studies suggest, however, that collaboration involving shared thinking may be more common in some cultural communities (Rogoff, Paradise, Mejia-Arauz, Correa-Chávez, & Angelillo, 2003).

The present study examined children’s collaborative processes in Indigenous-heritage Mexican and middle-class European-heritage U.S communities. It explicitly examines cultural differences in children’s fluid collaboration, looking specifically at children blending agendas as an ensemble. The study builds on literature involving peer collaboration in controlled situations and cultural comparisons of children’s collaboration in controlled situations and in naturalistic settings as they collaborate in household work and community endeavors.

**Children’s Peer Collaborative Processes**

Peer collaboration has been defined as the coordination of actions during a collaborative process working towards the solution of a problem or a shared goal, with joint attention and mutual engagement (Gauvain & Rogoff, 1989; Gearhart, 1979; Kumpulainen & Kaartinen, 2003; Radziszewska, & Rogoff, 1991). Benefits of peer collaboration have been widely explored in computer-based activities. A study on
computer-based collaborative problem-solving found that the use of talk was the most important feature for collaboration, using a coordinated production of talk and action, turn-taking structure of the verbal interactions, along with narration and questions, among others, permitted participants to create shared knowledge (Roschelle & Teasley, 1995).

Research on collaboration has mainly focused on the results of collaboration and less often on understanding the collaborative processes, with a few exceptions (e.g., Ellis and Gauvain, 1992). Roschelle and Teasley (1995) pointed out that collaboration does not necessarily happen simply by putting two participants together, suggesting further examination of the interaction processes that might be necessary for collaboration. The middle-class European-heritage children that they studied tended to collaborate by segmenting the task and using turn-taking, in regards to access to the materials but also in talking about the task at hand. Similarly, Barron (2001) found that triads varied in the extent of engagement when a member attempted to engage the group to solve a math problem. More successful groups spent more time with both children engaged or one engaged, and less successful groups spent almost 10 times greater proportion with both children nonengaged. It has been suggested that the opportunities children have to collaborate with peers (in an innovative school vs. traditional school where collaboration is minimum) might foster children’s collaborative practices (Matusov, Bell & Rogoff, 2002).

**Cultural Differences in Children’s Collaboration: Household Work and Community Endeavors**
Research on cultural differences in collaboration has noted that in many Indigenous and Indigenous-heritage communities of North and Central America children engage in extensive collaboration and helping in ongoing family and community endeavors by observing others’ efforts and pitching in when necessary (Chamoux, 1992; Chavajay & Rogoff, 2002; Correa-Chávez, Roberts, & Martínez Pérez, 2011; de Haan, 1999; de Leon, 2000; López, Najafi, Rogoff, & Mejía-Arauz; Mejía-Arauz, Rogoff, Dexter, & Najafi, 2007; Paradise, 1994). For example, children in many communities of Mexico collaborate extensively in community-wide events such as during the *Dia de los Muertos* celebration where children take central roles by helping community members prepare for this 3-day event. There are some celebrations where the event almost entirely is organized and carried out by children and where children’s initiative and willingness to participate is central to these wide-community celebrations (Corona, 2011).

Several studies in Indigenous communities indicate that in addition to contributing to community endeavors, children’s contributions stem from the child’s own collaborative initiative and their motivation to pitch in rather than from parents’ explicit efforts to involve the child (de Haan, 1999). Similar results were reported in a Mexican Indigenous-heritage community, one mother reported, “When I’m washing the clothes and she hears the baby cry, she goes and picks him up and gives him the bottle. Since they see how I feed the baby they already know what to do,” (Alcalá et al., 2014; p.21). Also, Mazahua (Mexican Indigenous) mothers reported that children learn by being present as they take the initiative to contribute (de Haan, 1999).
Children’s collaboration at home appears to be more common in Indigenous-heritage communities than in European American middle-class communities (Farver, 1993; Whiting & Edwards, 1988; Whiting & Whiting, 1975). In Indigenous-heritage communities of Mexico, Central America, and some immigrant communities in the United States, children participate in a wide range of activities contributing with household work that benefits the family (de Haan, 1999; Gaskins, 2001; Orellana, 2003; Ramirez Sanchez, 2007; Rogoff, 2003).

In contrast, children in some middle-class communities spend a limited amount of time in household work contributing minimally and mostly with self-care chores (Alcala et al, 2014; Bianchi & Robinson, 1997; Bowes & Goodnow, 1996; Goodnow & Delaney, 1989; Hofferth & Sandberg, 2001; Ochs & Izquierdo, 2009; White & Brinkerhoff, 1981). Children in these middle-class communities tend to help only when parents explicitly request their help or when they are offered additional rewards such as pocket money (Goodnow & Warton, 1992; Mortimer, Dennehy, Lee, & Finch, 1994). For example, middle-class Mexican mothers reported that they had to request their children’s help or offer some type of reward such as taking them to the movies in order to get the children to clean their room (Alcalá et al., 2014). Recent research by Ochs and colleagues found that in dual-earner European-American families, children tended to help minimally and often struggle to get their children to collaborate with some type of household work, including self-care chores (Klein & Goodwin, 2013; Ochs & Izquierdo, 2009; Ochs & Kremer-Sadlik, 2013).

Cultural expectations to collaborate in Mexican Indigenous-heritage communities are expressed by values of being acomedido, respeto, and educado,
referring to children’s mindfulness in their interactions with others, being attentive and knowing when to collaborate, by having consideration for the overall direction of the group (Pimentel, 2009, Ruvalcaba, Rogoff, López, Correa-Chávez, & Gutiérrez, 2014). The Mexican value of being acomendido, helping without being asked, by being attentive to their surroundings and taking the initiative to help when appropriate, may encourage collaboration (López et al 2012, Ruvalcaba et al 2013; Urrieta, 2013). Research on acomendido suggests that Mexican immigrant mothers and families try to maintain this practice of helping others without being asked, even when they do not use this term often. Indigenous communities often treat children’s development and childhood as a process of reciprocity and exchange, where children are expected not only to help with family household work but are also expected to collaborate with extended family and community members (Ramirez Sánchez, 2007). Children in other Indigenous-heritage communities emphasize taking part in shared endeavors with mutual coordination with other family members, when describing their contributions to household work (Coppens et al, 2014).

**Cultural Differences in Children’s Collaboration: Working as an ensemble in Controlled Settings**

Fluidly collaborating with others in communities where children are encouraged and expected to contribute to ongoing activities of the family and community seems to be very prevalent in Indigenous communities of the Americas. This form of collaborating, with initiative and flexibility, is a central feature of a learning tradition called Learning by Observing and Pitching-In (Rogoff, Paradise, Mejia- Arauz, Correa-Chavez, & Angelillo, 2003; Rogoff, Moore, Najafi, Dexter,
Correa-Chávez, & Solís, 2007). Some key aspects of this approach emphasize collaborating with initiative, coordination of shared endeavors, use of keen attention and non-verbal communication and flexibility in leadership. In particular, facet 3 focuses on collaboration: “The social organization of endeavors involves **collaborative engagement as an ensemble**, with **flexible leadership**. Learners are trusted to take **initiative** along with others who together fluidly blend agendas at a calm mutual pace” (Rogoff et al, 2007; Rogoff et al, 2014, p. 7). I use this approach to examine cultural differences in children’s collaborative processes.

An example of collaborative engagement as ensemble is when Mazahua (Mexican Indigenous) mother-child dyads constructed a market stall: children collaborated with initiative and engaged in the planning process and mothers treated children as responsible, active collaborators, and engaged in the task with smooth flexibility in role exchange allowing the child to take initiative to contribute to the activity (de Haan, 1999; Paradise & de Haan, 2009). Likewise, Mazahua children showed a sophisticated form of fluid collaboration during the installation of panes of glass into window frames, as part of the collaborative construction of new classrooms done by community members, teachers, and students (Paradise & de Haan, 2009). Working in dyads or in small groups, children moved smoothly from the ‘observer’ role to ‘doer’ without any clear instruction or indication from others around them but based on their own initiative and attention, noticing when it was appropriate for them to help.

“The switching back and forth between active doer and observing supporter is smooth, one participant taking the initiative while the other takes on an observing supporting role, standing close by and still being closely involved in
the joint activity, although in a less hands-on manner… While they worked no one asked or looked for help in a direct way. When one child seemed to run into difficulty, another child took over and gave it a try while the first one watched… There was no way to foretell when the role switching between performer and observer-supporter would take place. It was smoothly done and, apparently at least, with no disagreements or negotiating… Their shared goal was to get the job done and this concern was what guided the role switching.” (Paradise & De Haan, 2009; pp. 6 & 7).

Few studies have examined cultural differences in children’s collaborative processes. One exception was a study by Ellis and Gauvain (1992) that found that Navajo children engaged more often in shared thinking when teaching a younger child how to play a game than their European American counterparts (Ellis & Siegler, 1997; Ellis & Gauvain, 1992). Navajo dyads remained engaged even when their partner took the leading role in instructing the younger child while the European American children more often became inattentive (Ellis & Gauvain, 1992). Navajo children were also more likely to extend or support information given by their peer to instruct the younger child, whereas European American children more often repeated statements or made new ones unrelated to their peer’s previous statements.

Similarly, the triads of Mexican-heritage immigrant children more often coordinated their actions together than European American children, who more often worked dyadically or individually when working in their origami figure (Mejía-Arauz, Rogoff, Dexter, & Najafi, 2007). Likewise, children from middle-class communities with extensive history of formal school whether in Mexico, Guatemala, or U.S. often worked individually, even in the presence of a group, dividing the task and assigning segments to individuals, rather than working horizontally, in multi-way groups which
seems to be characteristic of Indigenous-heritage communities of the Americas (Chavajay & Rogoff, 2002; Correa-Chávez, 2011; Mejía-Arauz et al., 2007; Rogoff et al., 1993, 2003). Similarly, in a cooperative and competitive board game, children from a village in Mexico behaved more cooperatively than Afro-American, European American, and Mexican-American children in California (Milard, Madsen, & Shapira, 1970).

These studies show that Indigenous-heritage children collaborate more, or at least divide the task less than middle-class European-heritage children. However, they do not closely examine the process of collaboration. The present study builds on these research findings suggesting that Indigenous communities show extensive fluid collaboration in everyday tasks, examining cultural differences in how children blend their agendas as they work on a planning task. I also explore the role of cultural values to collaborate and how these values and expectations might relate to children’s collaborative practices.

**The present study**

In this study I examined cultural differences in siblings’ fluid collaboration (or dividing roles) in a planning task, and the relation to children’s initiative in collaborating in household work. I expected that Mexican Indigenous-heritage children would collaborate with their sibling as a fluid ensemble more often than middle-class European-heritage children and less often by dividing roles. I also expected, that across backgrounds, children who show more initiative in collaborating with household work would engage in more fluid collaboration in the planning task. The research questions are as follows:
• Do Mexican Indigenous-heritage children collaborate with more fluidity and mutual pace in an imaginary planning task than middle-class European-heritage children?

• Does mothers’ reports of children’s initiative in collaborating in family household work relate to how children collaborate in the planning task?

As a secondary analysis, the study also includes Mexican-heritage siblings from families with more than 12 grades of schooling, to explore changes in cultural practices. I expect children from this background to show an intermediate pattern in collaboration, with some similarities to the other two backgrounds. Lastly, I explored cultural differences in mothers’ views on the value and importance of children’s helping on their own initiative, without being asked.

In the next pages I describe the method and report the results in the following four sections: 1) Differences between Mexican Indigenous-heritage and European-heritage siblings’ collaboration in an planning task, 2) Exploring collaboration in Mexican-heritage siblings whose mothers have extensive experience with western schooling, 3) Relation between children’s collaboration at home and their collaboration in the planning task, and 4) Cultural values that might relate to children’s collaborative processes.

Cultural Differences in Sibling Collaboration in a Planning Task

Method

Participants

The sample included 30 sibling dyads between 6 and 10 years of age from two cultural backgrounds:
1) 14 pairs of U.S. Mexican-heritage children whose mothers have less than 12 grades of schooling (M = 7.9 grades) and whose families likely have some experience with Indigenous practices ("Mexican Indigenous-heritage"). I presume that families with recent and limited experience with formal schooling might be more likely to have experience with indigenous practices. Previous studies have used maternal schooling as a predictive index of familiarity with Indigenous-heritage practices among immigrants from certain regions of Mexico. Historically, Indigenous communities have had limited access to formal schooling and until recently they have not had access to higher education (Martinez Casas & Navarrete Gómez, 2011). Formal schooling has been used as an index of likelihood of Indigenous-heritage practices among Mexican families from traditional Indigenous regions of Mexico (López, Najafi, Rogoff, & Mejía-Arauz, 2013).

The older child mean age was 9.5 years and younger child mean age was 6.8 years, sibling pair age averaged 8.14 years. Sibling pairs included: 6 pairs of sisters, 6 pairs of a sister and a brother, and 4 pairs of brothers. Mexican Indigenous-heritage mothers’ occupations included homemaker, housecleaner, restaurant worker, agricultural field workers, and baby-sitter. Fathers’ occupations included painter, cook, carpenter, welder, janitor, gardener, construction worker, agricultural worker, and machine operator.

2) 16 pairs of European American children whose mothers have extensive experience with Western schooling, 12 grades or more (M = 16.2 grades) ("middle-class European-heritage"). Older child age mean was 9.4 years and younger child age mean was 7.3 years, sibling pair age averaged 8.46 years. Sibling pairs included: 6
pairs of sisters, 9 pairs of a sister and a brother, and 1 pair of brothers. Middle-class European-heritage mothers’ occupations included homemaker, marketing, teacher, business owner, doctor, social worker, accountant, online designer, registered nurse, and marine scientist. Fathers’ occupations included city planner, registered nurse, engineer, accountant, doctor, gym owner/personal trainer, professor, engineer, insurance broker, mortgage worker, forester, software developer, school principal, and marine scientist.

Differences in schooling are one of many differences between the two communities in this study. This study considers cultural differences in terms of constellations of practices, including parents’ experience with Indigenous practices, formal schooling, and socioeconomic status. Thus the labels for the backgrounds are shorthands for whole constellations of cultural practices, not indexing a single variable such as ethnicity (Rogoff, 2003; Rogoff, 2011; Rogoff & Angelillo, 2003; Rogoff, Najafi, & Mejía-Arauz, 2014).

Participants were recruited from various schools and community centers in the Central Coast area of California. Several participants were referred by other participants. Background demographic information was collected via a questionnaire during the parent interview in a previous session conducted by Angélica López (López & Rogoff, in preparation).

**Procedure**

The procedure for the planning task was designed to put participants in a situation that required them to collaborate with each other. The two siblings were asked to find grocery items individually and then to work together to make a short
route by combining their individual plans. Sessions took place in the family’s home and were video taped for analysis. The sessions were conducted in the participants’ language(s) of choice without siblings or mothers present.

A bilingual research assistant (unaware of the hypotheses of the study) led the sessions starting with a 2- to 3-minute warm-up activity, engaging in conversations with the family to allow children to get comfortable and interact casually with the research assistant. Figure 1 below shows the set-up in the children’s home. Siblings stood around a small table that we brought along, beside each other and perpendicular to the research assistant. The first author was behind the camera or off to the side observing the activity.

![Sibling pair during the collaborative planning task.](image)

The planning task used a table-top roofless model grocery store of approximately 32 x 26 inches, based on that used in Gauvain and Rogoff (1989) (see Figure 1). Inside the grocery store, 111 grocery items, represented by colored pictures of grocery products attached to the walls, were displayed on 14 different “shelves” located on both sides of 5 aisles, as well as inside the 4 walls of the store. Pictures of a
shopping basket and a cash register were near the doorway in one corner of the store, as well as a start/exit sign. The shopping items were duplicates of the items used in the model store, pasted on 2-in square cards. To indicate their routes, participants were asked to place item cards on a card-holder (2.5 X 11 inches) in the order the items were being picked-up.

At the beginning of the session, children were encouraged to look around the model grocery store and the different grocery items. They were told that they needed to plan five shopping trips to take the “shopper” - a small plastic figure – to the store to buy some groceries but the shopper had sore feet and couldn’t walk for too long, so they needed to create the shortest route to help her get the items on her list. Children first created individual plans for a 5-item shopping list (their individual items included some overlapping items) and then they worked together to coordinate their plans and create a plan together for the combined shopping list. The 9-item list for the combined plan included 4 overlapping items from the individual plans, 4 items that only one child had, and one entirely new item. This was designed to encourage collaboration to create a short route. The first (practice) trial was shorter (with a 5-item list for the combined plan). The five lists were presented in standard order across participants.

After completing their joint plan on the table, the siblings took the “shopper” on the route she would use to fetch the grocery items from the store. They were instructed to stop at each item and place it on the “shopping cart” (a card-holder) before moving the shopper to the next item. The shopper started and ended her shopping trips at the store’s entrance.

Coding
The present study is the first to focus explicitly on cultural differences in working as an ensemble. In order to do this we had to develop a coding scheme focusing on shared thinking. My coding scheme benefitted from extensive discussions with Andrew Dayton and Barbara Rogoff. It was developed based on ethnographic analysis of the cases and built on suggestions from previous research on children’s social organization by Mejía-Arauz et al., (2007), Chavajay and Rogoff (2002), and Angelillo and Rogoff as cited by Lopez et al., (2013).

Coding started when the research assistant gave the children the cards for their combined plan and ended when the last item was placed on the shopping cart. The five collaborative episodes were divided into 10-second segments and were coded using four mutually exclusive main codes: fluid ensemble, coming to agreement, one leads, or dividing roles (which had several subcodes). Segments interrupted by family members or when the research assistant gave instructions were excluded.

Collaborating as Fluid Ensemble. Siblings worked together coordinating moves (e.g., moving the shopper and picking up items) and fluidly built on each other’s ideas. Both siblings contributed to creating the plan with joint action and joint attention throughout the segment as children built on each other’s actions and suggestions to develop the plan. It seems as if “four hands are working together as one body” without getting in each other's way (Dayton, personal communication). Their moves are coordinated, anticipating each other’s actions. In other words, siblings blend agendas with shared decision-making, allowing their partner autonomy while maintaining mutual pace. If they take roles within the segment (e.g., observer, doer),
they smoothly shift between temporary roles without stopping and restarting action, and without distinguishing one child as leader.

**Coming to agreement.** Both children worked together with coordination and attempted to negotiate obstacles to agreement in a productive way. The obstacles to agreement relate to their individual approach to the activity, such as children suggesting how to do the task better and coming to an agreement on how to create the route. (If their efforts were unproductive it was coded under “conflict.”)

**One child leads.** Both children were paying attention to each other, engaged in the task, although one was clearly leading the activity. For example: Older sibling takes the lead and starts organizing the cards to develop a plan, younger child observes and seems to be interested in the activity but does not contribute directly. Older child continues to organize the cards and every time she moves a card she explains to the younger child what she’s doing, acknowledging him as a participant even if he’s not directly contributing to creation of the plan.

**Dividing Roles.** The children were not collaborating and at most one child was involved in the activity. We distinguished what each child was doing. The subcategories included:

* **Bossy.** One child purposely tried to exclude the sibling, preventing access to the materials or telling the sibling child to do as this child says, in an imperious manner. The child told the sibling what to do (e.g., you take the shopper and I’ll put the items on the cart), without allowing the sibling to contribute beyond what he/she was told.

* **Implement the plan.** One child implemented the plan created by their sibling, not contributing to decisions. Their role is like a robot.


*Ignore & Work on task.* One child ignored the sibling while working on the plan. This could include working side by side without collaborating in decisions but also without conflict, or could include taking turns or otherwise alternating. The segment could be smooth or it could include children awkwardly getting in each other’s way, in “choppy” or segmented interaction with an on-and-off style. The coder distinguished what each child (A and B) was doing.

*One child tries to get in.* A sibling not working directly on the task tried to get in the activity. This sibling might provide suggestions on how to do the task, trying to contribute to the plan but with no success.

*Child tries to involve off-task sibling.* When one child was off-task their sibling encouraged them to collaborate by asking them questions, telling them how they’re going to do the activity, giving them something specific to do or even by just including them verbally in the process. But the other child remains off-task during the segment.

*Conflict.* Conflict (verbal or physical) included arguments trying to impose one’s own plan, dismissing the sibling’s contributions, interrupting each other, breaking each other’s agendas, taking cards out of the sibling’s hands without their consent, or pushing the other sibling away to prevent the sibling from contributing to the task. This conflict does not aid the activity but deflects attention away from the activity and interrupts the flow of the activity.

*Off-task.* One child (or both siblings) was not engaged, not paying attention, perhaps engaged in a non-related activity.

**Route length**

As background information, we examined the length of the shopper's route, using a digital *opisometer* (a small wheeled gauge for calculating distance from maps). The total distance for each shopping trip was calculated for their final combined plan, when participants took the shopper through the store to pick up the items.

**Reliability**
A bilingual trained research assistant unaware of the hypotheses of the study coded 30% of the data for reliability purposes and the primary coding was done by the author. Interobserver reliability, calculated using Pearson’s $r$ correlation, was high to adequate (Gelfand & Hartmann, 1975, suggest .60 for correlation statistics): fluid ensemble ($r = .93$), coming to agreement ($r = .96$), one-leading activity ($r = .80$), and dividing roles ($r = .81$). The reliability for the subcodes of the dividing roles category was also high to adequate: one child being bossy ($r = .96$), sibling implements plan ($r = .80$), one child ignores sibling while working on plan ($r = .90$), one child tries to get in ($r = .77$), sibling off-task ($r = .95$), and conflict ($r = .93$).

**Results: Collaboration in the Planning Task**

On average the episodes consisted of 108 10-second segments (about 18 minutes) for both backgrounds. Given the variation in the number of minutes the pairs took to complete the shopping trips, analyses were based on the proportions of total segments across the five trials. Across the collaborative codes, no age differences were found and only one gender difference was found, it is explained below. Because Mexican Indigenous-heritage children were expected to work more collaboratively than Middle-class European-heritage children, t-test analyses were all one-tailed in this section (with one exception explained below).

As explained below, working together as a fluid ensemble – with sustained joint attention, joint action, and smooth role exchange – was the most common form of collaboration for the Mexican Indigenous-heritage children. The most common form of collaboration for European-heritage children was dividing roles.
**Fluid Ensemble.** Mexican Indigenous-heritage children worked as fluid ensemble in more than half of the segments (53%), and more than twice as often than the middle-class European-heritage children, who only worked as a fluid ensemble in 25% of the segments, $t(28) = 3.01, p = 0.005$. (See Table 1 for means, standard deviations, and effect size). In fact, 4 of the 14 dyads in the Mexican-heritage background only used fluid ensemble throughout the 5 trials; no European-heritage pair did so. In contrast, 3 of the 16 dyads in the middle-class European-heritage background never worked as a fluid ensemble.

An example of collaborating as a fluid ensemble was provided by a Mexican Indigenous-heritage dyad (See Figure 2). This dyad worked fluidly throughout the five trials, without any breaks in their joint action and joint attention. A few seconds after spreading out the cards on the table, when the younger child picked up a card and pointed to a location in the store, saying “this one goes first because it is by the entrance,” the older sibling looked at the location, took the card that the younger sibling was holding up and placed it on the shopping plan. They continued working this way finding and arranging the rest of the items, building on each other’s ideas, suggestions, and blending their agendas to create a combined plan. As they worked together on the plan, their movements were “synchronized” and fluid, with mutual pace, anticipating each other’s actions. No matter where they moved, they showed joint action throughout the session. Notice in Figure 2 their hand position, posture, and attention are all coordinated in these two images. As they moved around the table their movements were synchronized and coordinated. In contrast, Figure 3 shows siblings
who did not coordinate their movements and got into each other’s way with no mutual pace.

[Figure 2. Mexican Indigenous-heritage siblings anticipating each other’s actions, coordinated/synchronized moves, working together with mutual pace, moving around the table as one.]

[Figure 3. Siblings getting in each other’s way.]

**Coming to agreement & One sibling leading.** Collaboration by coming to agreement and with one sibling leading the activity were equally common among children of both backgrounds, with no significant differences between the two backgrounds. On average children of both backgrounds spent about 14-15% of the time engaged these two forms of working together (See Table 1).
**Dividing Roles.** Middle-class European-heritage siblings spent almost half of the segments (44%) dividing roles; this was more than twice the proportion of segments that the Mexican Indigenous-heritage siblings spent dividing roles (16% of the segments), $t(28)=3.27, p<.005$. The next paragraphs describe the ways in which the children divided their roles. Some of the most common patterns involved examining what the two children were doing; others focused on one child at a time. The two most common forms of dividing roles in the middle-class European-heritage background were when one child was being bossy (especially when one sibling bossed and the other implemented the bossy child’s plan) or when one child ignored their sibling while working on the plan.

*Bossy-implements.* When one child was bossy, the sibling often implemented the plan developed by the bossy child. This was 6 times as common in the middle-class European-heritage pairs (in 13% of the segments, than in the Mexican Indigenous-heritage pairs, who spent only 2% of the segments working this way), $t(28)=3.26, p<.003$.

*Bossy.* Including the bossy-implements segments, over 20% of the segments were spent by one child bossing the sibling in the middle-class European-heritage pairs, whereas only 4% of the segments for the Mexican Indigenous-heritage backgrounds were spent by dividing roles in a bossy way. Middle-class European-heritage children engaged in bossy forms of working together more often than Mexican Indigenous-heritage children, $t(28)=3.42, p<.005$.

There were also significant differences between groups when one child was being bossy and the other child was not implementing the plan (the sibling either paid
attention to the bossy child's activity or unsuccessfully tried to get into the activity; “other bossy”) $t(28)= 2.47, p < .01$. Middle-class European-heritage children spent 8% of the segments in “other bossy” and Mexican Indigenous-heritage children spent 2% of the segments. Figure 4 shows an example of the older sibling being bossy, while the other child is trying to get in.

Figure 4. European-heritage siblings, older child pushing younger child with his right arm.

The three middle-class European-heritage siblings who never did fluid ensemble spent an average of 50% of their segments with one sibling being bossy and the other sibling either implementing the plan or trying to get back into the activity. For example, Figure 4 shows the older sibling pushing the sibling in a bossy way. Even before the research assistant placed the cards on the table, the older child reached for the cards and as soon as the research assistant put the cards on the table, he took them and did not let the younger sibling take part in creating the plan. The older child worked on the plan without making eye contact with the younger child who tried to get in by suggesting how to arrange the cards but failed.

*Ignore and work on individual task.* Middle-class European-heritage siblings were 3 times more likely to divide their roles by *ignoring* their sibling while working
on the plan (in 23% of their segments) than the Mexican Indigenous-heritage siblings (in 7% of the segments), $t(28) = 2.39, p = .025$. The differences included when only one child was ignoring the other $t(28) = 2.12, p = .025$ and when both siblings ignored each other, working side-by-side engaged on different parts of the plan with no attempt to collaborate $t(28) = 1.84, p = .05$. Only one significant gender difference was found in siblings’ collaboration. For the ‘Ignore each other,’ variable, that is when both children are individually engaged in the activity but without any collaboration efforts, dyads were composed of a brother and a sister, spent significantly more segments ignoring each other ($M=3.85, SD = 5.34$) than when the dyads were composed of two brothers ($M=0.85, SD = 0.94$) or two sisters ($M=0.71, SD = 1.29$), $F(2,40) = 3.39, p = .04$.

In Figure 5 the older child created the plan and he completely ignored his sibling. The younger sibling continued talking to himself, moving around the table, trying to get into the activity, and often going off-task. Every time the younger sibling tried to get in, the older sibling pushed him out as seen in Figure 4.

Figure 5. European-heritage child ignoring the younger sibling while working on the plan.
Trying to get in. Middle-class European-heritage siblings three times as often (7% of segments) tried to get in the activity than Mexican Indigenous-heritage siblings (2% of the segments), *t*(28) = 2.32, *p* < 0.03.

Conflict. Conflict was rare in both backgrounds (1% and 3%); there were no significant differences in the proportion of segments when children had some type of conflict.

Going off task occurred in 6-10% of segments, no differences between groups. It was mostly when they were ignored or being pushed away, and the other child was coded as bossy.

In sum, working as a fluid ensemble was the most common pattern for the Mexican Indigenous-heritage children whereas dividing roles was the most frequent pattern for the European-heritage sibling pairs, who spent a higher proportion of segments being bossy or ignoring the sibling while working on the plan.

Route Length

The average length across all five trials was used for this analysis. Overall, middle-class European-heritage pairs had shorter routes than Mexican Indigenous-heritage children, but route length was due to age differences across backgrounds. In other words, the younger the sibling pair the longer the route turned out to be. Younger siblings’ age contributed significantly to the route length. For example, the three longest routes in the Indigenous-heritage background dyads were created by the three youngest dyads. One of the youngest dyads averaging 6 years of age created one of the longest routes with an average length of 123.78 compared to the average length for Mexican Indigenous-heritage pairs (79.51) and for the European-heritage pairs
(63.10). The average age of the sibling pairs was negatively correlated with route length across participants ($r = -.51, p < .001$). Using an ANCOVA, I controlled for younger siblings’ age, the significant differences in route length between the Mexican Indigenous-heritage and Middle-class European-heritage dyads disappeared, $F(2,42) = 2.66, p = .08$.

**Collaboration Among Mexican-heritage Hi-Schooling siblings:**

**Nepantla Background**

A secondary analysis was conducted to explore how children from highly schooled Mexican families differ from Mexican Indigenous-heritage and Middle-class European-heritage families. I will refer to this background as *Nepantla* background. *Nepantla* is a Nahuat word that describes being in the middle of negotiating two ways of being, used to describe how the Indigenous people in Mesoamerica were dealing with their original practices and the practices brought by the Spaniards (Anzaldua, 2002; Jaramillo & McLaren, 2011). Based on previous research on the role of mothers’ schooling, we expected that children in this background would show an intermediate pattern of collaboration compared with the Mexican Indigenous-heritage and Middle-class European-heritage participants (Laosa, 1980). Because our prediction was not more specific than that, two-tailed t-tests were used for this analysis.

**Participants**

Participants included 13 Mexican-heritage dyads whose mothers had at least 12 grades, with mother’s schooling averaging 13.2 grades. Sibling pairs included 2 pairs of sisters, 5 pairs of brothers, and 6 pairs of sisters and brothers. The average age
for the older child was 9.2 years and the younger child mean age was 6.6. Nepantla background mothers worked as homemaker, college enrollment specialist, health educator, writer, teacher’s aide, social worker, waitress, store clerk, cook, housecleaner, restaurant worker, and workshop facilitator. Fathers’ occupation included self-employed landscaper, dispatcher, videographer, curator for an arboretum, social worker, construction worker, day laborer, electrical engineer, intelligence analyst, cook, warehouse worker, and facility manager.

**Results**

Overall, Nepantla background siblings showed an intermediate pattern in how they collaborated in the planning task (See Table 2 for means, standard deviations, and significance values). In particular, Nepantla background siblings collaborated as a fluid ensemble in slightly but not significantly more segments than middle-class European-heritage siblings and in nonsignificantly fewer segments than Mexican Indigenous-heritage siblings. Also, Nepantla background siblings spent less segments in coming to agreement, than the other two groups, but with no significant differences.

The expected intermediate pattern was also found in the overall extent of dividing roles, with the Nepantla siblings dividing roles significantly more than the Mexican Indigenous-heritage and showing no significant differences from the middle-class European-heritage. The subcategories of dividing roles generally had values falling between the other two backgrounds, or at least not significantly outside the range of the Mexican Indigenous-heritage and middle-class European-heritage background groups. For a few of the subcategories, they were significantly closer to one or the other background groups. For example, Nepantla background siblings
engaged in “bossy” ways in a nonsignificantly higher proportion of segments than Mexican Indigenous-heritage siblings but in a significantly lower proportion of segments than middle-class European-heritage siblings, $t(27)=2.68, p < .01$. (See Table 2 for details).

**Relationship between Collaboration in the Planning Task and Collaboration in Household Work**

Participation in household work may provide children with opportunities to learn to collaborate with others to solve problems and achieve a goal (Dunn, 2004; Goodnow, 1997). Previous research suggests that even if children do not collaborate on their own initiative but only when parents asked them to help, if the work they do benefits the family (as opposed to self-care chores) they tend to be more prosocial (Grusec, Goodman, & Cohen, 1997). However, this empirical work is limited to middle-class communities and more work is needed to further explore the relationship between children’s family contributions and their collaborative processes/approaches. This section examines the relationship between children’s collaboration in family household work (whether children collaborated on their own *initiative* or whether their collaboration was *controlled* by adults) and their collaborative processes in the planning task across all participants.

The interview on children’s household contributions was adapted from previous studies related to children’s initiative in household collaboration by the author and Angelica Lopez (Alcalá et al, 2014; Coppens et al., 2014), and was conducted in a previous session by Angelica Lopéz. To address the second research question, I examined the relationship between sibling’s collaboration in the planning
task and their collaboration in household work. I also report cultural differences in children’s extent/range and initiative in household contributions. The general findings on the extent and complexity of siblings’ contributions have already been reported by Lopez and Rogoff (in preparation).

Three of the participants in that study were no longer available for this study and two of the participants in my study were not used in her study due to equipment malfunction. Because of missing interview data from 3 families from the middle-class European-heritage background, the number of participants is less than in part 1 of the study and now includes: 14 Mexican Indigenous-heritage and 13 Middle-class European-heritage sibling pairs (N=27).

**Procedure**

Children’s collaboration in household work was examined based on mothers’ reports of each child’s regular household contributions. The interview included demographic information, questions regarding children’s extent of contributions to household work and type of involvement, and whether the work is done based on children’s own initiative or whether parents offered some inducement to get the child to collaborate.

The semi-structured interview was carried out in a casual, conversational way, asking questions regarding each of the children, older and younger. (See Appendix A for a complete list of the interview questions). The initial question was: *What do your children do to help around the house? How?* Follow up questions explored the extent to which children collaborated on their own initiative, taking the task as their own responsibility without being asked by parents or if they only collaborated when asked
by adults or when offered some reward or to avoid punishment. Taking the most complex household task mentioned by the mother the interviewer asked,

1) Does the child independently take responsibility for doing this task?
2) Do you sometimes have to persuade or convince them to do it? Do they receive a reward for doing it? Are they punished if they don’t do it?

**Coding**

Mothers’ reports on each child’s range and complexity of contributions to household work were coded using a 3-point coding scale developed by Alcala et al. (2014) to quantify children’s contributions. Each type of contribution was given a complexity score, based on the difficulty and complexity of the work. For example, Cooking or cleaning the bathroom was given a score of 3, washing the family’s clothes was given a score of 2, and sweeping was given a score of 1.

*Child Initiative* involved children doing the work on a regular basis without being asked, on a scale taking into account the range and complexity of work done by children. The highest possible score for Child Initiative was 8 and included collaborating with complex household work tasks and doing the work on a regular basis without any adult control. Child initiative included voluntary contributions, doing the work on their own steam, without adults requesting or pressing the child to help. Initiative relates to children’s willingness to contribute, noticing the work that needs to be done and pitching in to get the work done. The 8-level scale summarized the level of initiative for each sibling pair (combining the two children’s contributions) as follows:
8 = work done regularly with child initiative, without a prearranged contract or need to be asked or persuaded to collaborate. Work included level 3 or level 2 on the complexity scale.

7 = work done regularly with child initiative, without a prearranged contract or need to be asked or persuaded to collaborate. Work included at least 3 different types of work at level 1 of the complexity scale and no level work at 2 or 3.

6 = work is done mainly with child initiative but with some prearranged contract or need to be asked or persuaded to collaborate. Work included work at level 3 or 2 on the complexity scale.

5 = work is done with some child initiative but mostly with some prearranged contract or need to be asked or persuaded to collaborate. Work included work at level 3 or 2 on the complexity scale.

4 = work is done mainly with child initiative but with some prearranged contract or need to be asked or persuaded to collaborate. Work included at least 3 different types of work at level 1 of the complexity scale and no work level 2 or 3.

3 = work is done with some child initiative and some prearranged contract or need to be asked or persuaded to collaborate. Work included at least 3 different types of work at level 1 of the complexity scale and no work at level 2 or 3.

2 = work done regularly with child initiative, without prearranged contract or need to be asked or persuaded to collaborate. Work included only 1 or 2 types of work at level 1 of the complexity scale.

1 = work done some initiative but mainly with prearranged contract or need to be asked or persuaded to collaborate. Work included only 1 or 2 types of work at level 1 of the complexity scale.

0 = no initiative only prearranged contract or need to be asked or persuaded to collaborate. Work included only 1 or 2 types of work at level 1 of the complexity scale.

*Adult Control* involved different techniques reported by the mothers to control the activity. Children collaborated only when parents offered some type of contract or
rewards. They could use charts/prizes for doing certain work. Adult control also included parent and child engaging in struggle and negotiation. The mother and child argued about the activities and responsibilities of the child and the child often fails to complete the task and the parent nags the child until they do work, children and parent negotiate what needs to be done. The adult control scale had 3 levels:

2) Most of the work is done with adult control (e.g., punishment) and with no initiative,
1) There is a mix of child initiative and some adult control,
0) No adult control, mostly child initiative.

Reliability. A bilingual assistant coded one-third of the data for reliability purposes and primary coding was done by the author and Angelica López. Reliability between the blind coder and the other two coders was excellent ($k = .80, r = .93$)

**Results of Household Collaboration**

Children in both communities contributed to family household work to some extent. As reported in Lopez & Rogoff (in preparation), on average, Mexican Indigenous-heritage children contributed six times more than Middle-class European-heritage children.

Mexican Indigenous-heritage children were reported to collaborate with initiative in household work at a much higher level on our scale of child initiative, $t(24) = 4.94, p < .001$, than middle-class European-heritage children (See Table 1 for means and standard deviations). Six children in the Mexican Indigenous-heritage backgrounds received a score of 8 and only one child in the middle-class European-heritage backgrounds obtained a score of 8. Only one Mexican Indigenous-heritage sibling received a score of 0 and ten European-heritage siblings received a score of 0.
Mexican Indigenous-heritage mothers often reported how eager their children were to help around the house. One mother stated:

“Ellos ya saben lo que tiene que hacer... ellos ya están grandes y saben que se tienen que acometer porque el día de mañana ellos solos o algo, ya saben hacer las cosas independientemente, sin tener que darle un premio o algo.”

“They already know what they need to do… they are old enough and know that they need to ‘help on their own initiative’ because in the future they might be by themselves and that way they already know how to do things independently without having to receive a reward or something.”

The values on the Adult Control scale correlated highly with the values of the child initiative scale ($r = -.65, p < .001$), not surprisingly. The European-heritage siblings were reported to collaborate based on Adult Control at a much higher level than the Mexican Indigenous-heritage children $t(24) = -3.95, p < .001$. Seven European-heritage siblings received a score of 2 for Adult control and only one Mexican Indigenous-heritage sibling received a core of 2. On the other hand, 7 Mexican Indigenous-heritage siblings received a core of 0 and only 2 European-heritage siblings received a 0\(^1\).

The Nepantla background siblings showed an intermediate pattern in the extent of siblings’ reported collaboration in household work with Child-Initiative or reliance

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\(^1\) The use of “chore charts,” to keep track of children’s contributions, was very common for the middle-class European-heritage participants. The mother in the previous excerpt used an App to keep track of her children’s chores. If the children didn’t chart the task in her phone as done, they wouldn’t get their allowance. When we asked the Mexican Indigenous-heritage mothers if they use some type of chart/graph to keep track of their children’s chores, they were very surprised and thought that this was a very strange idea and an unnecessary one, if children already know what needs to be done then why use a chart. None of the mothers in the Mexican Indigenous-heritage backgrounds reported using a chart.
on Adult-Control. There were no differences between the two Mexican backgrounds. But Mexican-heritage pairs were more often reported to collaborate with initiative than middle-class European-heritage sibling $t(24) = 3.19, p = .004$ ($M = 4.25$ vs. $M = 1.18$). On the other hand, middle-class European-heritage more often contributed in household work based on adult control than the Mexican-heritage siblings, $t(21) = 2.79, p = .01$. On the 8-point initiative scale Nepantla siblings scored 4.25 versus 1.18 scored by the middle-class European-heritage siblings; the middle-class European-heritage siblings scored 1.65 in the adult control scale whereas Nepantla background siblings scored 0.80.

Lopez and Rogoff (in preparation) used a different but related scale that combined child initiative and adult control; findings regarding cultural differences in child initiative and adult control were similar.

The relationship between collaboration at home and collaboration in the planning task was based on the entire sample. I correlated children’s initiative and adult control scores with their proportion of segments spent in fluid ensemble, coming to agreement, one child leads, and dividing roles and its subcategories.

Child Initiative. Children who were reported to collaborate in family household work on their own initiative, without being asked, were more likely to work together as a fluid ensemble with joint action and joint attention, blending their agendas by building on each other’s ideas ($r = .44, p = .007$). Similarly, if siblings collaborated with initiative at home they were less likely to engage in the planning task by dividing roles with one child being bossy and the sibling implementing their commands ($r = -.47, p = .002$). No other correlations were significant with child initiative.
Adult Control. Sibling pairs who were reported to collaborate at home based on ‘adult control’ that is, helping only when parents asked them to help or when they offered some type of reward, more often divided roles with one child being “bossy” and the sibling “implementing” the plan created by the sibling ($r = .48, p = .002$).

Cultural Values and Expectations to Collaborate

Since there were no differences in values reported cross the two Mexican background groups we combined them for this analysis.

Procedure and Coding

I explored the role of cultural values and expectations to being acomedido, helping without being asked (López, Ruvalcaba, & Rogoff, in press), in children’s collaboration with family and peers based on the following question: “Is it important for you that children help without being asked?” In addition, Mexican-heritage mothers were asked this question using the word Acomedido to ask if this was important value/practice in their family.

Mothers’ responses were coded in three categories: It is important that children help without being asked, It would be ideal but it is not expected, and It’s not important.

Results

Overall, participants varied in their views and expectations for children to collaborate without being asked. All of the 14 Mexican-heritage mothers reported that it was important that children help without being asked and 11 of the 16 middle-class European-heritage mothers reported that it was important ($\chi^2(2)= 9.23, p = .01$). Furthermore, 4 Mexican Indigenous-heritage mothers reported that it was beyond
important to help without being asked -- it was just expected that children would take
the initiative to notice when help is needed and to collaborate before they were asked
to help. Some of the Mexican Indigenous-heritage mothers expressed that there was no
merit in helping only when asked. One mother mentioned,

“Yes. It is important because that way, one knows that helping is coming from
them (‘les nace del corazon acomedirse’ = helping without being asked is born
from their heart) and that there’s no need to be telling them ‘Take the trash out,
mop, clean.’ And that they by themselves are starting to help. That’s what I
think.”

“For mi es bien importante porque imagínese, vamos a una parte y que ellos
solitos se levanten y levanten su plato…. ve en México estamos acostumbrados
que a uno lo invitan a comer y pos a recoger su plato o algo…Ayudar,
acomedirse hacer algo. Y hay niños que no lo hacen. Y a mi me da gusto
cuando vamos a Mexico, que mi hija … le limpia la casa a mi mamá. Le lava
el baño, le barre, y me gusta que ellos vean [que pueden ayudar].”

“For me it is very important because imagine, we go somewhere and they by
themselves get up and clear their plate…. You see in Mexico, we’re
accustomed to, if you’re invited to eat and then you clear your place or do
something… To help, spontaneously help with something. There are kids that
don’t do that. I am very pleased that when we go to Mexico, that my daughter
pitches in. She helps my mom clean her house, she would clean the bathroom,
sweep, and I like that they see that they can help.”

The majority of the middle-class European-heritage mothers reported that it
was important for children to help without being asked but a few of them mentioned
that this was not realistic and one mother reported that it was not important for
children to help without being asked. For example, one Middle-class European-
heritage mother mentioned:
“I like that! (laughing) It’s nice when it happens and yet I try to remind myself that when you’re 8 years old or 11 years old, you’re in your own world and not thinking, ‘Oh, mommy needs helps right now.’ So yeah, I try to be realistic about the age and expectations.”

Another mother reported:

“Mmm... I mean in an ideal world, yeah I would love for them to help without being asked but, I think, that I don't want any… it doesn't bother me that I have to ask them to help. Like it doesn't, I don't make it a priority in our family that like they're always in trouble because I'm always having to ask them or something like that.”

The role of cultural values and expectations to collaborate with others seemed to be more central in the Nepantla background than in the Mexican Indigenous-heritage background. 11 Nepantla background mothers reported that it was beyond important, it was expected that children collaborate without being asked compared, to only 4 Mexican Indigenous-heritage mentioning this expectation.

**Discussion**

**Sibling Collaboration in the Planning Task**

Mexican Indigenous-heritage children spent a higher proportion of segments collaborating as a *fluid ensemble*, blending agendas with their siblings in a flexible and coordinated fashion, than middle-class European-heritage children in the planning task.

The middle-class European-heritage siblings spent a higher proportion of segments dividing the task into separate roles than the Mexican Indigenous-heritage siblings. One of the most common patterns of dividing roles by the European-heritage siblings was when one child was bossy and the sibling simply implemented the plan
developed by the bossy child. The other pattern that occurred in a high proportion of segments was when one child (or both) ignored the sibling while working on the plan.

Overall, there were four Mexican Indigenous-heritage sibling pairs that worked solely as fluid ensemble and three European-heritage sibling pairs that never engaged in fluid ensemble. These differences resemble the two ends of the spectrum in how children from the two backgrounds collaborated when they were asked to work together and to help each other.

These findings parallel results from the few other studies that have examined cultural differences in collaborative processes. For example, Paradise and de Haan (2009) reported fluid coordination and role exchange in Mazahua mother-child dyads, similar to the fluid collaboration showed by the Mexican Indigenous-heritage siblings. Similarly, these results echo findings in the ethnographic literature on children’s extensive opportunities to collaborate with family and community members in Indigenous-heritage and Mexican-heritage communities (Gaskins, 2000; Orellana, 2001).

As expected, for the most part, the Mexican-heritage background group whose mothers had extensive schooling showed an intermediate pattern, engaging together in a fluid ensemble less often than the Mexican Indigenous-heritage siblings and more often than the middle-class European-heritage children and showing the reverse pattern for dividing roles. However, Nepantla background siblings spent significantly greater time in Coming to agreement than Mexican Indigenous-heritage and European-heritage children. These results mirror previous studies that also explore cultural differences based on maternal schooling (e.g., Correa-Chavez & Rogoff,
2010; Lopez, 2014) in which some of the Nepantla background participants resemble the Mexican Indigenous-heritage backgrounds and some participants resemble the middle-class European-heritage way of collaborating.

**Relation Between Children’s Collaboration at Home and their Collaboration in the Planning Task**

Children who were reported to collaborate in household work with *initiative* were more likely to collaborate as *fluid ensemble* and less likely to *divide roles* when working with their sibling in the planning task. In contrast, children who were reported to collaborate at home mainly with *adult control* – based on contingent rewards or punishment – were more likely to collaborate by dividing roles in the planning task with one child being bossy and one child implementing the plan developed by the other sibling.

It seems that children’s ways of collaborating at home might relate to how they were collaborating with their sibling in the planning tasks. Collaborating as a fluid ensemble with their sibling mirrors the fluid collaboration in household work, where children simply collaborated noticing what needed to be done and pitching-in to do the work. Overall, Mexican heritage children were reported to contribute more often on their own initiative and European-heritage siblings were more often reported to collaborate when adults managed their contributions. Similarly, Lopez & Rogoff (in preparation) found that sibling pairs that were reported to collaborate with initiative had higher scores of helping an adult during a craft activity, than siblings whose household contributions were reported based on adult control.
Overall, these findings suggest that children might build on their home practices when working on a ‘school like’ task, such as the planning task. Children’s collaboration at home on their own initiative might serve as a model for collaborating in other contexts, by being skillful at building on each other’s ideas and blending agendas with the backgrounds. On the other hand, if children are used to being told what to do or to collaborating only when adults manage their involvement, they might be more likely to try to ‘control’ the way they work with their sibling in a different task.

**Cultural Values and Expectations to Collaborate**

Collaborating with initiative, helping without being asked, is a value that seems to be prevalent in the Mexican-heritage participants, who reported that it was beyond important that children should help without being asked.

These findings fit with the model of learning through Intent Community Participation a learning paradigm that seems to be prevalent in Indigenous and Indigenous-heritage communities where children are integrated into a wide range of family and community activities. Children learn by pitching-in and helping when needed by being attentive to the needs of others and taking the initiative to help.

Fluid collaborative processes might reflect the way Indigenous communities are organized resembling a horizontal organization. In many Indigenous communities of the Americas, children are integrated into a wide range of mature activities. Children are encouraged to collaborate with others and are expected to help in any way they can. Children are viewed as complete community members, even before they
can make real contributions, and this cultural value might relate to children’s tendency to collaborate in such fluid manner (Ramirez Sanchez, 2007).

In contrast, children in middle-class communities are often segregated from mature activities. Children in these communities spend a significant amount of their free time in adult organized activities that are age-segregated and that might limit their opportunities to collaborate with others (Lareau, 2000). Their participation in the community is delayed until they reach a mature age and are considered complete community members. These differences in community organization guide children’s everyday experiences and their likelihood to engage in community events vs. child-focused activities, where children are simply consumers and not contributors (Rahm, 2002).

**Importance of Collaboration for Children’s Development**

Collaboration is a complex and important skill. It requires a host of cognitive processes in order to be able to work with others and to achieve a goal while maintaining group cohesion. For some people collaboration means having to give up something, losing autonomy and control over the situation, and they may view collaboration as a burden to their activities/goals. But in some communities, such as in the Mexican Indigenous-heritage communities, collaboration goes beyond the immediate achievement of goal, communities are organized based on reciprocity and interwoven relationships. The collaborative approach in many indigenous-heritage communities reflects a horizontal way of organizing the families and communities. Children collaborate with each other to solve a problem or achieve a goal that will have an impact at the community level, such as in the case of community-wide
celebrations (Corona, 2011). In these community-wide celebrations, people collaborate with flexibility and without the need to have roles or duties assigned. Community members, including children, simply pitch in on what needs to be done. It doesn’t mean that there is no leadership or organization but the organization is not purely hierarchical but rather horizontal, allowing members to take the initiative to collaborate. It would be interesting to see if the notion of “diffusion of responsibility” – when the group malfunctions without one specific leader – is universal or culturally specific, building on these results.

The way siblings worked in the planning task reflect different models of involvement with Mexican Indigenous-heritage siblings preferring to engage in group endeavors versus individual tasks. Related to that is the cultural values of being *acomedido*, helping without being asked. Being acomedido relates to the ways Indigenous communities of the Americas are often organized highlight the value of being part of something bigger, being a competent member of the community, regardless of their age. This was reflected in the way our participants responded to our invitation to participate in the study. Some Mexican Indigenous-heritage mothers reported that by helping us in this project, they were helping their own children. They were sure that one day, when their children needed help in some school project or in a different area, other community members would help them, fitting with the reciprocity in community relations that is reported in other indigenous heritage communities.

Children’s collaborative processes might also serve as a basis for learning in other contexts. For example, key to the development of planning skills is the ability to adapt planning strategies flexibly to the changing circumstances of the problem at
hand (Baker-Sennett, Matusov, & Rogoff, 1993; Hayes-Roth & Hayes-Roth, 1979; Pea, 1982; Rogoff, Baker-Sennett, & Matusov 1994). This cognitive flexibility, seen in improvisational and opportunistic planning, is especially important when working with others in everyday tasks under changing circumstances. The pivotal work of Hayes-Roth and Hayes-Roth (1979) provides a compelling model that emphasizes the importance of opportunistically planning during action. For example, Rogoff et al. (1995) found that when delivering Girl Scout cookies, girls sometimes had an advance plan for delivering the orders; however, effective plans involved flexibility and improvisation in delivering the cookies when some people were not home during the delivery of the orders and the planned route became inefficient. This cognitive flexibility has been measured using individual planning tasks, such as executive function tasks, but seems to be crucial when planning and collaborating with others, perhaps relevant in the case of household work contributions (Zelazo, 2006; Zelazo, Carter, Reznick, & Frye, 1997).

When children contribute to household work for the family, children have to be flexible in adapting and coordinating their plans with others, sometimes improvising as the members of the family try to achieve a goal within the changing circumstances and resources. Working with others provides opportunities for the development of collaborative processes such as flexibility, improvisation, and shared-thinking in action. When there is lack of flexibility, conflict may arise as when the plans of one party conflict with the plans of the other (Goodnow & Delaney, 1989). Collaborating in household work has been reported by middle-class European-heritage parents as a constant battle with their children who are less likely to take the initiative to
collaborate at home (Ochs & Izquierdo, 2009). Adults tend to manage and oversee their children’s chores, by assigning them, and often paying them as a way of teaching them responsibility and how to manage money (Furnham & Kirkcaldy, 2000).

Likewise, collaboration among adolescents and young adults has been found to be beneficial in various ways. For example, freshman students who were assigned to work in pairs in an introductory computer programming class performed better on an individual post-test and were more likely to choose computer programming as their major than students who worked individually. Collaboration benefits were particularly significant for women in this field (Werner, Hanks, & McDowell, 2002) and it is suggested that collaborative skills might be particularly important for minority students who have been historically under-represented in the STEM fields and who seemed to collaborate in very sophisticated ways.

The ability to collaborate and build on each other’s ideas and contributions could be crucial in children’s development and particularly for underrepresented groups. If we build on the cognitive skills and practices that children bringing from home to school, such as fluid collaboration, we could adopt an approach in the classroom setting that is in accordance with their home practices. These findings can help us to continue to move away from deficit models in regards to minority children development. The overrepresentation of Latino and African-American children in special education might be the source of a mismatch of practices and expectations between the children’s home and school. We need to further investigate the collaborative processes that can be used at school, especially for minority students, but also to improve the learning experience of all students. In fact, some innovative
schools have taken a collaborative/community approach to children’s learning and have received excellent results (Rogoff, Goodman Turkanis, & Bartlett, 2001).

Collaboration requires cognitive flexibility. Collaborative processes are not only important for other cognitive skills but are also complex cognitive skills in its own right. Being able to build on each other’s ideas and work to achieve a shared understanding requires skill and effort. Understanding the cultural differences in collaborative processes can be the building blocks for understanding other cognitive processes and can help us take a broader approach to understanding children’s development.
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Appendix A. **Household contributions interview questions, to be asked in a conversational format.**

*Mother Interview.*

Name of the person responding:
What’s your current occupation?
Who lives here in the home?
Name of the children participating in the study, older and younger child?
Date of birth for older child? Date of birth for younger child?
Where were the children born? (city, country)
Does someone in the home speak or understand an indigenous dialect?

**Questions about children’s contributions:**

In a normal day, does the older child help around the house?
How does older child help? What does the older child do? [Ask for examples]

Does the older child help with [any of the tasks below]?
- Irons clothes, cooks for the family, runs errands, washes the family’s clothes, mops the house, runs vacuum, folds/hangs family clothes, sets/clears the table, washes dishes, sweeps the kitchen or living room

Does the older child do any other chores?, e.g., in the garden, patio?

[Choosing a chore the older child does regularly, ask the following questions]
Why does your older child participate in these tasks?
Does the older child independently take responsibility for doing [it]?
Does the older child do it because they want to help?
Do you sometimes have to ask the older child or persuade them to do it? For example?
Do you give them a reward or money when they do it? For example?
And if they don’t do it? Do you scold the older child when they don’t do it? time-out? Take away allowances?

Do you consider these activities, children’s contributions, important for the upbringing of the child? Why?
Does the older child care for younger siblings/other children? (If the answer is NO skip to next section.)

What does s/he do?/How does your older child care for his/her siblings?

Do they often [use the examples below]:

- Change diapers/clothes, bathe, put to bed
- Feed the younger child
- Carry/cuddle the younger child
- Play with the younger child

Is taking care of the younger sibling something that is the child's regular responsibility?

Does it occur to the older child independently to care for their younger siblings? Does the older child help because he wants to help?

Do you sometimes have to ask or persuade the child to do it? For example?

Is the child allowed to scold their younger sibling? Tell them what to do?

Does the child receive a reward or money for taking care of another child? Example? Why?

Does the older child participate in any classes outside of school, such as sports, religious classes, etc.?

How often does the older child participate? [find out hours per week]

Who decides what classes/sports the children will participate in?

Who plans the activities? (What are they?)

Does the child plan his/her activities at home?

Does the child plan what he/she will wear each day?

Does the child plan or help plan birthday parties or other parties?

How much time does the child have for free play?

Where do they play? Is there adult supervision?

Does the child have a job outside the home?

Do you give allowances or domingo to your child? Is it contingent?

Are there occasions when you don't give them one? Example

Repeat questions for younger child.

*Child Interview*

What do you do to help out around the house?
Do you help with [e.g., ironing clothes, cooking, run errands, wash clothes, vacuum the living room, mop the house, fold clothes, set/clear the table, wash dishes, sweeping, pick up your toys or clothes]?
Do you do any other work? E.g., garden, etc.?
How do you help?

Do you have a job away from home? What do you do?

Is [e.g., clearing the table / choosing something the child does] something that is regularly yours to do?
Do you do it because you want to help?
Do you take responsibility for [---] without being asked?
Do you sometimes need to be told to do it?
And if you don’t do it?
Do you get a reward or money when you [---]? For example?
Are you scolded when you don’t [---]? Are you punished? How?

Do you take care of any younger siblings? [or other small children] (If answer No, skip to next section.)
Do you take care of them only when you’re asked to?
Do you take care of them because you want to help out?
Are you given a reward or money for taking care of the little one? For example?

Do you get an allowance/dinero for helping at home?