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Sociocultural Influences on the Development of Self-Recognition and Self-Regulation in Costa Rican and Mexican Toddlers

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The aim of this study was to examine sociocultural influences on the development of specific sociocognitive developmental milestones. The self-recognition and self-regulation skills of 2-year-old children were assessed in two autonomous-relational cultural contexts: educated, urban, middle-class families from Costa Rica ($N = 19$) and Mexico ($N = 15$). These two cultural groups are representative of a consistent pattern of an autonomous-relational Latin American cultural model; there were no differences between the two groups in mothers' socialization goals, maternal behavior during mother-child play, and toddlers' self-recognition and self-regulation. As predicted by ecocultural models of development, consistent cultural models emerged: Sociodemographic factors were associated with mothers' relative emphasis on autonomous socialization goals and lower levels of directive and didactic play. There were also significant correlations between facets of mothers' cultural models and toddlers' development of self-regulation, but not self-recognition. This study provides further evidence that the sociocognitive development of children's self-regulation during the second year is dependent on the "ecological imprint" that is provided by their mothers' cultural model. Furthermore, the same mechanisms that account for cross-cultural differences also seem to account for intracultural variation in maternal behavior and toddlers' development.

Keywords: self-regulation; self-recognition; culture; socialization goals; mother-child play

Over the last few decades, many studies have confirmed that the development of young children is contingent on certain contextual demands. Most, if not all, cognitive and sociocognitive achievements are experience-based and will develop at different rates depending on the *ecological imprint*, that is, perceptions and experiences that infants and toddlers make in interactions with their social and nonsocial environment (Boesch, 2007; Henrich, Heine, & Norenzayan, 2010). Different socialization pressures accelerate or decelerate the emergence of social and sociocognitive achievements, such as the categorical self and self-regulation (Keller et al., 2004), false-belief understanding (Chasiotis, Kiessling, Hofer, & Campos, 2006; Naito, 2003; Vinden, 1999, 2002; Wellman, Cross, & Watson, 2001), and person perception (Miller, 1987) during early childhood. Because of these differential socialization experiences, culture-specific manifestations of the self emerge that have been characterized as independent or interdependent (Markus & Kitayama, 1991) or as autonomous, autonomous-relational, or relational (Kağıtçıbaşı, 1996, 2007; Keller, 2007). Inherent in these models is the assumption that there are culture-specific socialization experiences and developmental pathways that led to these culture-specific representations of the self.

Research from our laboratory has shown that cross-cultural differences in sociocognitive development do not show arbitrary patterns but are related to cultural models that dominate and are adaptive in specific sociocultural contexts (Greenfield, Keller, Fuligni, & Maynard, 2003; Keller, 2007; Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000). A cultural model can be defined as a system of meanings and activities that is shared within a specific sociocultural context. This system includes socialization strategies in the form of parental socialization goals (SGs), parental ethnotheories, and parenting behavior (Keller, 2007). Cultural models are formed by the universal needs of autonomy and relatedness. A prototypical autonomous cultural model is based on a view of the self as an independent and autonomous being. The autonomous cultural model emphasizes individuals' independence and freedom of choice and is adaptive in urban, highly educated, middle-class families in "Western" societies. The primary SG of parents from autonomous cultural contexts is to support their child's individuality and autonomy. A prototypical relational cultural model is based on a view of the self as interdependent. The relational cultural model emphasizes individuals' dependence on and relatedness with others. The dominant SGs in these hierarchical social systems reflect compulsory role obligations, including caring for dependent family members and being obedient to older family members. Relational cultural models are adaptive in rural, subsistence-based ecologies, in which many children and extended family systems are most common.

Clearly, these two prototypical sociocultural contexts are contradictory in many respects, including values, ethnotheories, and parenting behaviors. There are, however, numerous sociocultural contexts in which both autonomy and relatedness are of similar importance. These cultural models are often referred to as autonomous-relational and they typically include highly educated urban families from "non-Western" societies (Kağıtçıbaşı, 2007; Keller, 2007). These autonomous-relational sociocultural contexts are of particular interest because the two dimensions of autonomy and relatedness must be integrated and negotiated on two different levels, collectively and individually. First, each autonomous-relational culture will find its own way of supporting both autonomy and relatedness in children, for example, in terms of dominant cultural norms concerning

children's socialization and development. Second, within each autonomous-relational culture, both autonomy and relatedness are negotiated within each family. Taking these two factors into consideration, there should be more variation within and between autonomous-relational samples as compared to both prototypical autonomous and relational sociocultural contexts.

As a consequence of their dual emphases on autonomy and relatedness, autonomous-relational cultural contexts often take an intermediate position between the prototypical autonomous and prototypical relational sociocultural contexts. For example, Keller et al. (2004) showed that the emergence of an early self-concept as assessed by mirror self-recognition (MSR) and self-regulation varied systematically across sociocultural contexts. Although 19-month-olds from an autonomous cultural context (Athens, Greece) exhibited better self-recognition than did toddlers from a relational cultural context (rural Nso, Cameroon), they did not exhibit as much self-regulated behavior in response to maternal requests as did the rural Nso toddlers. Toddlers from an autonomous-relational cultural context (San José, Costa Rica) were intermediate to these two groups in terms of both self-recognition and self-regulation. Furthermore, these divergent developmental outcomes could be predicted by parenting behaviors when toddlers were 3 months old. On an individual level, distal parenting (i.e., mutual gaze and object stimulation) during mothers' free play with their 3-month-olds predicted MSR at 19 months, whereas proximal parenting (i.e., body contact) predicted responsiveness to maternal requests at 19 months. The way in which autonomy and relatedness manifest in maternal discourses about child care yields a similar pattern of results (Kärtner et al., 2007). Because there are manifold possibilities of combining autonomy and relatedness, participants with an autonomous-relational cultural model are particularly informative for disentangling developmental dynamics. Despite this, empirical studies are scarce.

Therefore, in this study, we focused on developmental dynamics within two autonomous-relational cultural contexts—urban middle-class families in Costa Rica and Mexico. There were two main research questions. First, does autonomy and relatedness manifest differently in the two sociocultural contexts? There could be considerable variation in how the dual autonomous-relational emphases manifest in mothers' parenting behavior and toddlers' development. Second, do the same mechanisms that explain cross-cultural variation also explain intracultural variation? To answer this question, we examined the relation between sociodemographic variables, mothers' normative orientation and parenting, and toddlers' development on an individual level.

Based on our theoretical model, we formulated three main hypotheses. First, within the two formally educated, urban, middle-class samples, variation in sociodemographic variables (i.e., mothers' level of formal education and family composition) should be associated with mothers' normative sociocultural orientation. Specifically consistent with cross-cultural research, higher education levels and nuclear family composition should be associated with a more autonomous normative orientation (Kağitçibaşı, 2007; Kärtner, Keller, & Yovsi, 2010a; Richman, Miller, & LeVine, 1992; Whiting & Whiting, 1975). Second, we hypothesized that mothers' relative emphasis on autonomy would foster autonomous developmental outcomes (i.e., self-recognition) in their children, whereas mothers' relative emphasis on relatedness would foster relational developmental outcomes (i.e., self-regulation) in their children. This finding would support the idea that the same mechanisms are responsible for both intra- and cross-cultural variance in development.

Autonomous-Relational Cultural Models: Urban Middle-Class Families in San José, Costa Rica, and Guanajuato, Mexico

Costa Rican middle-class mothers socialize their children toward values such as being well mannered, obedient, and respectful (Alvarez Hernández, Brenes Castro, & Cabezas Gutiérrez, 1990). Social desirability and proper demeanor are the values that parents cherish most (Miranda & Rosabal-Coto, 1997), and family networks play an important role (Keller, 2007). In line with an autonomous-relational cultural model, Costa Rican mothers expect their infants to develop social skills earlier and cognitive skills later than mothers with an autonomous cultural model (Keller, Miranda, & Gauda, 1984). At the same time, also autonomous values such as self-maximization and independence are emphasized, especially in families with higher socioeconomic status (i.e., middle-class; Rodríguez Céspedes, Castro, & Espinosa, 1998). Furthermore, the prevalence of U.S. American TV implies a constant exposure to individualistic values such as individual choice and uniqueness (Rosabal-Coto, 2004).

In Mexican urban middle-class families, mothers similarly emphasize both autonomous and relational SGs (Diaz-Loving, 2006). Family allocentrism and relatedness are central values for Mexican parents (Marín, 1994), but also autonomous SGs such as autonomy and individuality gain importance, especially in the domain of formal education and academic achievement (Uribe, LeVine, & LeVine, 1994).

Cultural Models and Parenting Behavior

Parenting behavior has fundamental implications for toddlers' development. Specifically, mother-child play during toddlerhood plays an important role in child development, at least in independent and autonomous-relational sociocultural contexts (Keller, 2002; Tamis-LeMonda & Bornstein, 1996). Many authors, therefore, view mother-child play as the cradle of child development (e.g., Sutton-Smith & Kelly-Byrne, 1984). During mother-child play, the mother transmits her cultural values and customs and lays the cognitive, behavioral, and social foundations that are adaptive for the respective cultural context in which her child is growing up (Keller, 2007). Studies comparing independent and autonomous-relational sociocultural contexts have shown that there are cross-cultural differences in the way in which mothers structure the play environment with their children. For example, Farver (1989) found that when U.S. American mothers concentrated on the independent activities of their children and used a lot of praise, their children played in more complex ways. In contrast, Mexican children showed more complex play behavior when their mothers organized the play environment and used more directives. Another study by Farver (1993) showed that rural Mexican mothers used toys in a more didactic way than did Mexican mother from urban areas. Along a similar vein, Rosabal-Coto (2004) found that, during mother-child play, urban Costa Rican mothers were more empathic and dyadic than were Costa Rican mothers from rural areas. Finally, Keller, Borke, Chaudhary, Lamm, and Kleis (2010) showed that mothers with an autonomous-relational cultural model (Delhi, India) showed more didactic play characterized by maternal initiatives and directives, whereas mothers with an autonomous cultural model (Berlin, Germany) showed more autonomous play characterized by leaving the lead to the child and following the child's initiatives. To sum, directive mother-child play characterized by maternal directives, attention guiding, and teaching is common in relational sociocultural contexts (Keller, 2003; Rogoff, 1990). On the individual level, therefore, we hypothesized that a

relative emphasis on autonomous parenting should be associated with a higher responsiveness to toddlers' initiatives and less directive play (i.e., fewer verbal directives, less attention guiding, and less teaching).

Developmental Milestones During the Second Year: Self-Recognition and Self-Regulation

In this study, we examined parenting influences on the development of specific developmental milestones that are achieved during the second year of life: self-recognition and self-regulation. Each of these developmental outcomes is associated with one of the two basic dimensions that constitute the autonomous-relational cultural model, namely autonomy and relatedness. Based on previous research, we chose MSR as a developmental outcome that is indicative of an early sense of self-awareness; from the time toddlers correctly identify their specular image, they perceive themselves and others as autonomous intentional agents who are independent and separate from others (Kärtner, Keller, & Chaudhary, 2010; Moore, 2007). In support of this idea, cross-cultural studies have shown that a higher percentage of toddlers from sociocultural contexts that prioritize autonomy over relatedness recognize themselves in a mirror than do toddlers from sociocultural contexts that prioritize relatedness over autonomy (Kärtner, Keller, & Yovsi, 2010b; Keller, Kärtner, Borke, Yovsi, & Kleis, 2005; Keller et al., 2004). On the individual level, therefore, we hypothesized that a relative emphasis on autonomy (reflected in mothers' normative orientation and parenting behavior during free play) should be positively correlated with children's MSR.

Self-regulation refers to the development of children's ability to follow everyday customs and valued norms that are embraced and prescribed by their parents and others (Kopp, 2001). Accordingly, the competence to comply with caregivers' instructions and to monitor one's own behavior signifies a major developmental step during toddlerhood. As described previously, in prototypical relational sociocultural contexts, proper demeanor and responsibility training are core SGs, and caretakers have developed elaborate socialization practices intended to foster these competencies from early on (Ogunnaike & Houser, 2002). Furthermore, toddlers' ability to successfully perform errands determines the caretakers' perceptions of the toddlers' general level of competence. In line with this idea, there is empirical evidence that toddlers are more competent in following maternal requests in sociocultural contexts that prioritize relatedness than in prototypical autonomous sociocultural contexts (in which early responsibility is deemed less important; Keller et al., 2004; Whiting & Whiting, 1975). In addition, maternal guiding and gentle control in mother-child interactions is associated with increased compliance in children (Crockenberg & Litman, 1990; Kochanska & Aksan, 1995). On the individual level, therefore, we hypothesized that a relative emphasis on autonomy should be negatively correlated with toddlers' self-regulation, i.e., level of compliance.

In this study, we examined parenting influences on two developmental milestones during the second year of life (self-recognition and self-regulation) in groups of Costa Rican and Mexican toddlers from urban middle-class families. The main aims of this study were to (a) explore whether autonomy and relatedness manifest differently in the two sociocultural contexts, and (b) analyze parenting influences on children's behavior on an individual level. In a first step, we examined to what extent mothers' normative orientations are contingent on maternal education and family type (nuclear versus extended family) and whether this manifests in mother-infant interaction. To do so, we assessed mothers' relative emphases on autonomous (e.g., independence) and relational (e.g., obedience) SGs and related their

normative orientations to aspects of mother–infant free play that supported either toddlers' autonomy (e.g., following child initiatives) or toddlers' relatedness (e.g., maternal directives). We hypothesized that mothers' normative orientations will influence the way in which mothers interact with their toddlers and that both normative orientation and parenting behavior will affect other developmental outcomes that are associated with either autonomy or relatedness. To do so, we examined two developmental achievements that are central to sociocognitive development during the second year, namely self-recognition and self-regulation.

METHOD

Participants

Local or bilingual research assistants recruited families in collaboration with hospitals in San José, the capital of Costa Rica, and Guanajuato, the capital of the state of the same name in Mexico. There were complete data for 19 families from Costa Rica and 15 families from Mexico. Toddlers' ages ranged between 17 months, 15 days and 21 months, with an average age of 19 months, 11 days. There were no significant age differences between the Costa Rican ($M = 19.17$, $SD = .93$ months) and the Mexican ($M = 19.60$, $SD = .50$ months) samples, $t(32) = -1.56$, *n.s.* In both samples, about two-thirds of the toddlers were boys (Costa Rica = 74%, Mexico = 60%), $\chi^2 = .72$, *n.s.*, and about half of the toddlers were firstborn (Costa Rica = 58%, Mexico = 47%), $\chi^2 = .42$, *n.s.*

Mothers from Costa Rica were significantly younger ($M = 29.57$, $SD = 4.36$ years) than were mothers from Mexico ($M = 33.98$, $SD = 4.29$ years), $t(32) = -2.89$, $p < .01$. Across both samples, mothers had similar educational attainments in terms of years that they had received formal education (Costa Rica: $M = 13.17$, $SD = 3.92$ years; Mexico: $M = 14.86$, $SD = 3.90$ years), $t(32) = -1.21$, *n.s.* In both samples, the dominant family type was the nuclear family (Costa Rica = 70.6%, Mexico = 92.9%), $\chi^2 = 2.44$, *n.s.* In all other families, there was at least one cohabiting grandparent and, in some cases, one or more of the parents' siblings. For further analyses, we differentiated between nuclear and extended families. On average, there were 4 persons living in one household (Costa Rica: $M = 4.06$, $SD = 1.39$; Mexico: $M = 3.82$, $SD = 1.25$), $t(32) = .47$, *n.s.*

Apparatus and Procedure

Two female experimenters visited the families at home. The visits lasted for about 2 hours. After one of the experimenters had given an overview of the visit and the assessments, the mothers answered a questionnaire about sociodemographic information and SGs, while the other experimenter established rapport with the toddler. The behavioral tasks for this study were a mother–child play interaction, the rouge test, and a compliance-to-request task. All assessments were video-recorded by the second experimenter.

Autonomous and Relational Socialization Goals. To assess maternal SGs within the two central cultural dimensions, we generated a questionnaire designed to measure (a) autonomous SGs (e.g., develop personal talents and interests, learn to express own preferences very clearly), and (b) relational SGs (e.g., learn to do what parents say, learn to share with others). Each of these two sets contained four items.

Using a pairwise comparison procedure, each of the eight items was compared with each of the other seven items, one at a time, constituting 28 pairwise comparisons in total. For

each pair, mothers were asked to decide which of the two goals was more important to them or whether they were of equal importance regarding the development of their child. When scoring, a preference for goal A is counted as +1 for goal A and -1 for goal B and vice versa. If goals were rated as equally important, scores did not change. The order of autonomous and relatedness-oriented goals was balanced across pairs. By using this procedure, not only can we directly measure the relative importance of the values, but we can also assess the degree to which one value is more important than another. More importantly, response sets are mostly precluded by this approach because all respondents have the same mean across items (i.e., 0). Thus, it is easier to compare and interpret the relative importance of each goal across respondents without any statistical adjustment. In addition to the scores of the eight individual items, we computed a mean score of the four autonomous SGs, which can be interpreted as the importance mothers gave to autonomous SGs relative to relational SGs.

Mother-Child Play. Mothers were provided with a standardized set of toys (e.g., building bricks, puppet, car) and instructed to play with their children (however they would usually do so) for 10 minutes. The mothers' behavior during this play episode was coded from videotape. Because mothers and children often needed some time to get familiar with the situation and the toys, we focused our analyses on minutes 2 to 7. To characterize maternal behavior, we calculated the frequency (or duration) of five types of behavior: maternal initiatives, maternal following (duration), directives, attention guiding, and teaching. For *maternal initiatives*, coders identified onsets of episodes in which mothers showed a play initiative either verbally (e.g., "Have you seen this ball? Let's play with it!") or nonverbally (e.g., taking the ball and rolling it toward the child). To be counted, episodes had to last for at least 2s. An episode was counted as a new, separate episode if there was a pause of at least 5s between episodes. For *maternal following*, coders identified onsets and offsets of episodes in which mothers followed the initiatives of their children (e.g., the mother joined in a game the child initiated). *Directives* were coded each time the mother gave or repeated a directive (e.g., "Don't do that!" or "Give me the ball!"). *Attention guiding* was coded each time the mother guided her child's attention to a place, object, or person (e.g., "Look there!"). *Teaching* was coded each time the mother used didactic language or taught her child something (e.g., named an object, asked a question, instructed her child, corrected her child). For maternal following, the final score was the absolute duration of episodes. For all of the other maternal behaviors, the final scores were absolute frequencies of the target behaviors.

A pair of trained coders coded all maternal categories, and interrater reliabilities were calculated based on five videos from each sample. For maternal initiatives, directives, attention guiding, and teaching, the proportion of agreements for onsets relative to the total number of onsets coded by at least one of the coders (within a time tolerance of 1s between coders) ranged from .71 to .89. For maternal following, Cohen's kappa was $\kappa = .97$.

Self-Recognition. The rouge test is the standard procedure for assessing MSR, whereby a red mark is surreptitiously placed on the toddlers' face before they see themselves in a mirror for the second time (Amsterdam, 1972; Gallup, 1970). In both sociocultural contexts in this study, mirrors were of comparable size and the children could see their whole figures in the mirror. The experimenter explained the procedure and instructed any other people present to keep out of the area reflected in the mirror and not to say anything that might help the toddlers to localize the mark. The experimenter then set up the covered mirror in a suitable place, leaning it against a wall if possible. During the first phase of the rouge test, the toddler looked at his or her mirror image while the researcher and mother sat on both sides of the mirror. After approximately 3 minutes, the mother surreptitiously put a dot of red lipstick on

the child's face close to the nose with her index finger while pretending to blow the child's nose or clean the child's face. In the second phase of the rouge test, the toddler again looked at his or her mirror image for 5 minutes (or shorter if he or she displayed clear mark-directed behavior).

Performance on MSR tasks was coded from videotape. A pair of trained coders evaluated whether the children showed mark-directed behavior. Mark-directed behavior was defined as toddlers either (a) touching their own face with an extended index finger while looking in the mirror, or (b) pointing toward their own face while turning to and looking at another person. Critically, none of these mark-directed behaviors occurred during the first phase of the task. Reliabilities were calculated based on five videos from each sociocultural sample, and there was 100% agreement between coders for both samples.

Self-Regulation. In six separate tasks, the mother asked her child twice to bring an object to her, to another location, and to the experimenter (cf., Keller et al., 2004). The mother was asked to select objects that were familiar to the child. The objects needed to be within reach of the child and emotionally neutral. The mother was instructed not to interfere other than by repeating the request if necessary. Children's performance was coded from videotape. A pair of trained coders evaluated whether the child successfully followed each of the maternal requests. The final score was the relative frequency of successfully performed requests, ranging from 0 to 1. Reliabilities were calculated based on five videos from each sociocultural sample, and Cohen's kappa indicated a medium to high reliability, $\kappa = .85$.

RESULTS

There were two main research questions that we aimed to answer in the present study. First, does autonomy and relatedness manifest differently in the two urban middle-class samples from Costa Rica and Mexico? To answer this question, we analyzed differences in maternal SGs, parenting behavior, and toddlers' developmental outcomes between the two samples. Second, do the same mechanisms that explain cross-cultural variation also explain intra-cultural variation? We used correlational analyses to test the hypothesis that mothers' normative orientation is influenced by sociodemographic variables (e.g., level of formal education, family type), which, in turn, influence maternal behavior during mother-child play and their toddlers' developmental outcomes (self-recognition and self-regulation). We also used mediation analyses to test whether the direct effects of the sociodemographic variables on maternal behavior or child outcomes were mediated by maternal SGs.

Socialization Goals

As shown in Table 1, the relative scores for the eight SGs were very similar for Costa Rican and Mexican mothers. The differences between the two samples were very small (Cohen's d s were all less than .30) and none were significant.

When we compared the ranks of each SG (1 = most important, 8 = least important) between the two sociocultural samples, the ranks for each goal were either identical (e.g., assertiveness = rank 8 in both samples) or adjacent (e.g., sharing = rank 1 for Costa Rican and rank 2 for Mexican mothers). Consequently, the means of the relative ranks of the four autonomous SGs were also very similar between the two samples (see Table 1). The fact that these scores were close to zero supports the theoretical assumption that both autonomy and relatedness were emphasized to similar degrees in the two samples.

TABLE 1. Cross-Cultural Differences in Socialization Goals (SGs)

SG Type	Costa Rica		Mexico		<i>t</i>
	<i>M</i> (<i>SD</i>)	Range	<i>M</i> (<i>SD</i>)	Range	
Autonomous SGs	.00 (1.17)		.01 (.77)		– .03
Personal talents/ interests	1.00 (2.54)	–4–6	1.60 (1.84)	–2–6	–.77
Express preferences	.74 (2.31)	–2–5	.73 (2.12)	–3–3	.77
Being different from others	.68 (1.83)	–3–4	.73 (1.98)	–4–3	.80
Assertiveness	–2.00 (2.69)	–7–1	–2.60 (2.38)	–7–1	.68
Relational SGs	.00 (1.17)		–.01 (.77)		–.03
Sharing	1.16 (2.29)	–3–5	1.47 (1.41)	0–4	–.46
Social harmony	–.37 (2.87)	–7–4	–.13 (2.30)	–5–3	–.26
Respect elders	.16 (2.43)	–4–4	–.20 (2.46)	–5–5	.42
Obedience	–1.37 (2.87)	–7–3	–1.60 (3.31)	–7–6	.22

Note. Cohen's *ds* indicate small differences: *ds* < .30.

Maternal Behavior and Children's Self-Recognition and Self-Regulation

Table 2 shows the mean scores for each sociocultural sample of the five types of maternal behavior during mother–child play (maternal initiatives, maternal following, directives, attention guiding, and teaching), as well as the children's self-recognition and self-regulation scores. With respect to maternal behaviors, there were no significant differences between the Costa Rican and the Mexican samples for maternal initiatives, maternal following, directives, or teaching, but Mexican mothers guided their toddlers' attention more frequently than did Costa Rican mothers. With respect to children's developmental outcomes, toddlers from both samples showed similar rates of self-recognition and self-regulation. These results show that autonomy and relatedness manifest very similarly in the Costa Rican and Mexican samples; therefore, we collapsed the data across the two samples for all further analyses.

Cultural Models and Toddlers' Development

In support of our hypotheses, we found that both maternal education and family type (i.e., living together as a nuclear family) were associated with a stronger emphasis on autonomous SGs (see Figure 1). A stronger emphasis on autonomous SGs was, in turn, associated with fewer maternal directives, less teaching, and less attention guiding during mother–child play. Within the different maternal behaviors, attention guiding was positively correlated with maternal teaching, directives, and initiatives, whereas maternal initiatives were negatively correlated with maternal following. With regard to children's developmental outcomes, a stronger maternal emphasis on autonomous SGs was associated with lower levels of self-regulation (compliance to maternal requests) in children. Furthermore, maternal initiatives during mother–child play were negatively correlated with children's self-regulation. With

TABLE 2. Mean (SD) Frequencies or Durations of Maternal Behaviors and Children’s Self-Recognition (MSR) and Self-Regulation (Compliance) as a Function of Sociocultural Sample

Variable	Costa Rica	Mexico	Test Statistics
Mother–child play			
Maternal initiatives	5.79 (3.01)	5.87 (3.38)	$t = .07, d = .02$
Maternal following (s)	106.20 (69.8)	98.50 (69.8)	$t = .32, d = .11$
Directives	15.53 (13.84)	18.13 (12.99)	$t = .56, d = .19$
Attention guiding	15.37 (11.34)	25.00 (11.26)	$t = 2.47^*, d = .85$
Teaching	27.63 (15.21)	24.40 (14.26)	$t = .63, d = .22$
Developmental outcomes			
Self-recognition (%)	63.20	53.30	$\chi^2 = .33$
Self-regulation (proportion)	.58 (.25)	.69 (.26)	$t = 1.19, d = .41$

* $p < .05$.

regard to children’s self-recognition, only toddlers’ age was correlated with MSR. None of the maternal behaviors were correlated with children’s MSR.

As shown in Table 3, there were only two more significant correlations. First, maternal education was negatively correlated with maternal attention guiding during mother–child play and, second, toddlers from nuclear families showed lower levels of self-regulation.

For these two correlations, we performed mediation analyses applying Baron and Kenny’s (1986) four-step model. Given that we had defined specific hypotheses and the sample size was rather small, we used $p < .10$ as the significance criterion. To test whether the effect of maternal education on attention guiding was partly mediated by autonomous SGs, we examined

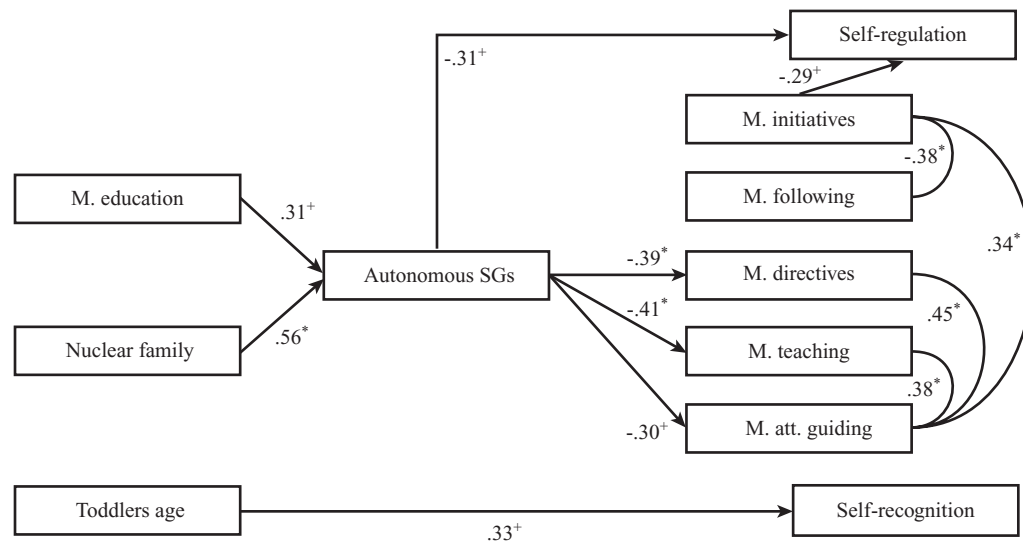


FIGURE 1. Correlations between contextual factors, maternal socialization goals, maternal behavior, and toddlers’ developmental outcomes.

Note. M = maternal; att. = attention; SGs = socialization goals.

⁺ $p_{one-sided} < .05$. * $p < .05$. ** $p < .01$.

TABLE 3. Correlations Between Maternal Education, Family Type, Socialization Goals, Maternal Behavior, Self-Recognition, and Self-Regulation

	1	2	3	4	5	6	7	8	9	10
1 Toddlers' age										
2 Nuclear family	.12									
3 Education	.09	.37*								
4 Autonomous socialization goals	-.11	.56**	.31 ⁺							
5 Maternal initiatives	.01	-.10	-.10	-.02						
6 Maternal following	.03	.03	.05	.18	-.38*					
7 Maternal directives	-.27 ⁺	-.16	-.20	-.39*	.13	-.07				
8 Maternal attention guiding	.02	-.12	-.31 ⁺	-.41*	.34*	-.18	.45**			
9 Maternal teaching	-.02	-.08	-.11	-.30 ⁺	.15	-.07	-.11	.38*		
10 Self-regulation	-.12	-.34 ⁺	-.21	-.31 ⁺	-.29 ⁺	.17	.21	-.10	-.25 ⁺	
11 Self-recognition	.33 ⁺	-.22	-.19	-.19	-.03	-.09	-.09	.07	.05	.04

Note. Family type was scored as 0 for extended family and 1 for nuclear family. The pattern of high and low correlations was very similar within both samples but, because of the small samples size, not all of the correlations that were significant in the total sample reached significance.

⁺ $p < .10$. * $p < .05$. ** $p < .01$.

whether Baron and Kenny's criteria applied. First, there was a significant total effect of maternal education on maternal attention guiding ($\beta = -.31$, $p < .10$). Second, there was a significant total effect of maternal education on autonomous SGs ($\beta = .31$, $p < .10$). Third, there was a significant direct effect of autonomous SGs on maternal attention guiding, controlling for maternal education ($\beta = -.34$, $p < .10$). Finally, the direct effect of maternal education on attention guiding decreased when controlling for autonomous SGs ($\beta = -.20$, *n.s.*; $R^2 = .20$, $p < .05$). This finding can be taken as evidence that the direct effect of maternal education on attention guiding was partly mediated by autonomous SGs.

To test whether the direct effect of family type on self-regulation was partly mediated by autonomous SGs, we again applied several criteria. First, there was a significant total effect of family type on toddlers' self-regulation ($\beta = -.34$, $p < .10$); i.e., toddlers living in nuclear families showed lower levels of self-regulation than toddlers living in extended families. Second, there was a significant total effect of family type (i.e., living as a nuclear family) on autonomous SGs ($\beta = .56$, $p < .01$). Third, there was a direct effect of autonomous SGs on self-regulation, controlling for family type, that approached significance ($\beta = -.31$, $p_{one-sided} < .10$). Finally, the direct effect of family type on self-regulation decreased when controlling for autonomous SGs ($\beta = -.18$, *n.s.*, $R^2 = .19$, $p < .10$). This finding can be taken as evidence that the direct effect of family type on self-regulation was partly mediated by autonomous SGs.

DISCUSSION

The objective of this study was to examine the developmental dynamics within two autonomous-relational sociocultural contexts. There were two main research questions. First, does autonomy and relatedness manifest differently in two autonomous-relational cultural contexts (urban middle-class families from San José, Costa Rica, and Guanajuato, Mexico)? Second, do the same mechanisms account for cross-cultural and intra-cultural variation in

development? Drawing on ecocultural models of development (Keller, 2007; Whiting & Whiting, 1975), we tested the hypotheses that mothers' normative orientations are influenced by contextual factors (e.g., maternal education, family type), which, in turn, influence mothers' parenting behavior. Maternal parenting behavior should ultimately influence toddlers' developmental outcomes.

The finding that autonomous SGs were stressed to the same degree as were relational SGs in both sociocultural contexts supports our theoretical assumption that mothers predominantly followed autonomous-relational cultural models emphasizing both autonomy and relatedness to similar degrees. At the same time, the medium to large ranges for most SGs provided some descriptive support for the assumption that there is a great deal of interindividual variation within each sample and that, within each family, autonomy and relatedness have to be integrated and negotiated.

On a collective (i.e., intercultural) level, we explored whether autonomy and relatedness manifested differently in the two autonomous-relational samples that we tested. Overall, there was not much support for this assumption. Specifically, the mean scores and relative rank orders of each of the SGs were very similar for Costa Rican and Mexican mothers. Furthermore, with regard to maternal behavior and toddlers' developmental outcomes, the only difference between the samples was that Mexican mothers guided their toddlers' attention significantly more often during mother-child play than did Costa Rican mothers. Based on these results, it seems reasonable to conclude that the two sociocultural contexts are comparable with regard to their emphases on specific SGs and parenting practices. Thus, it seems as if the two groups of urban, educated, middle-class families can be taken as representative of a consistent pattern of an autonomous-relational Latin American cultural model.

In contrast to the absence of intercultural variation, there was intracultural (interindividual) variation within each of the samples. For the sample of well-educated, urban Latin American families, a consistent pattern regarding maternal factors emerged: Maternal education and living as a nuclear family both influenced mothers' normative orientation by increasing their emphasis on autonomous SGs. The greater emphasis on autonomous SGs was, in turn, associated with less directive play in terms of maternal directives, teaching, and attention guiding. Furthermore, the maternal behaviors observed during mother-child play showed significant intercorrelations. Thus, as ecocultural models of development suggest, mothers' values and norms are influenced by contextual factors and inform maternal behavior (Keller, 2007; Whiting & Whiting, 1975). There is one caveat to this interpretation; given the correlational nature of these analyses, we cannot discount the alternative interpretation that more autonomous mothers are more likely to complete higher levels of education and choose to live in nuclear families. This interpretation is unlikely, however, given that several cross-cultural studies have shown similar results at the cultural level (e.g., subsistence-based farming ecologies that prioritize relational SGs or highly educated, middle-class families that favor autonomous over relational SGs; Lamm & Keller, 2007; Kärtner et al., 2007; Keller, 2007).

With regard to toddlers' developmental outcomes, we found that, in line with our hypotheses, a relative emphasis on autonomous SGs was associated with lower levels of self-regulation. In other words, toddlers were more compliant when their mothers favored relational over autonomous SGs. Furthermore, this finding, together with the consistent pattern that emerged for the mothers' cultural model, suggests that the same mechanisms that account for cross-cultural variation also account for intracultural variation in maternal behavior and toddlers' development. In this way, this finding complements earlier cross-cultural studies on toddlers'

self-regulation and compliance; the authors of these studies argue on an individual level but, in most cases, provide data on an aggregate (i.e., cultural sample) level (Chen et al., 2003; Keller et al., 2004; Munroe & Munroe, 1972). There was no other consistent, significant relation between maternal behavior during mother–child play and children’s self-regulation, with the exception of a negative correlation between maternal initiatives and self-regulation and a direct effect of family type on self-regulation. This finding is surprising for two reasons. First, following the theoretical model previously outlined, one would expect a positive correlation between maternal initiatives and self-regulation, because both are manifestations of a more relational cultural model. However, taking mother–infant interactions and behavioral routines into account, one could argue that toddlers that show less compliance just lack the impetus to initiate a behavioral response to maternal requests because they are used to high levels of maternal structuring and guidance. Second, this finding is surprising because most developmental models assume that mothers’ norms and values are transmitted via maternal behavior. As a consequence, there should be more consistent correlations between maternal behavior and toddlers’ developmental outcomes. One could argue, however, that parenting behavior is not uniform across different types of mother–child interaction (e.g., requesting versus playing) but is context-specific. In this way, a mother who grants autonomy to her child during free play might, to a certain degree, also socialize her child to be obedient to maternal requests. In this sense, mothers’ SGs influence maternal behavior during mother–child play as well as toddlers’ compliance. Therefore, maternal behavior in this study was not consistently associated with toddlers’ behavior, because mother–child play and maternal requests are two different and apparently unrelated interaction formats. As indicated by the mediation analysis, the direct positive effect of living as an extended family on toddlers’ compliance was mediated by the mothers’ normative orientation.

The percentage of toddlers who recognized themselves in the mirror was comparable to that of similar studies. Other studies (also with 19-month-olds) have reported recognition rates of 68% in Athens, Greece, and 50% in San José, Costa Rica, (Keller et al., 2004) and 70% in Berlin, Germany, and Delhi, India (Kärtner et al., 2010). With regard to sociocultural influences on autonomous developmental outcomes, self-recognition was positively correlated with toddlers’ age, but it was not related to any of the sociodemographic or maternal behavior variables. One possible explanation for this null result may be that the relation between a normative and behavioral focus on autonomy and self-recognition simply does not exist because self-recognition is an inappropriate measure if one is interested in understanding the self at this age. However, there are a number of studies that have shown that MSR correlates with other developmental achievements that suggest that toddlers have a representation of the self as autonomous agents that have own feelings and experiences. For instance, there is empirical evidence that self-recognition correlates with self-conscious emotions such as embarrassment (Lewis et al., 1989) and pronoun use (Courage, Edison, & Howe, 2004; Kärtner et al., 2010b; LeVine, 1983; Lewis & Ramsay, 2004). Rather than discounting MSR as a valid measure of an early self-concept to explain the null results of this study, we would rather like to suggest that self-recognition is more sensitive to age effects than is self-regulation and, therefore, the age range of 17–21 months masks any potential effects of mothers’ SGs or parenting behavior. However, this interpretation is inconclusive and underlines the need for further studies that examine the development of an early sense of self and social and socio-cultural influences thereon.

This study provides new empirical evidence for intracultural versus intercultural effects on maternal normative orientations and children's developmental outcomes. Given that this is a preliminary study, there are two important limitations that need to be addressed in future research. First, the observations were from two relatively homogeneous autonomous-relational contexts: formally educated, urban, middle-class families in Costa Rica and Mexico. As such, one must exercise caution in generalizing the findings beyond these specific sociocultural contexts. The present results need to be replicated across other sociocultural contexts with autonomous-relational cultural models. Furthermore, it would add much exploratory power to the proposed theoretical model if one would contrast different social classes (e.g., urban middle-class families versus urban lower-class families) within a more heterogeneous sample of families from the same region. Second, given that self-recognition seems to be highly age-sensitive, it might be beneficial to recruit samples with narrower age ranges. More generally, future research should try to improve existing measures of the developing sense of self during toddlerhood and early childhood. Finally, it would enrich the ecocultural perspective on early development if future studies could expand on potential influences and also include maternal discourse, because language and communication certainly play an important role in toddlers' socialization and would add one more puzzle piece to the emerging picture of culture-specific developmental pathways.

Despite the limitations mentioned earlier, this study also has several strengths, in that it provides new evidence for the consistency of cultural models within two autonomous-relational cultural contexts. As predicted by ecocultural models of development, we found a consistent pattern of contextual influences on mothers' normative orientation and behavior during mother-child play. In addition, there were significant correlations between facets of mothers' cultural models and toddlers' self-regulation. Thus, this study provides further evidence that the sociocognitive development of self-regulation during the second year is dependent on the "ecological imprint" provided by the toddlers' social and nonsocial environment. This ecological imprint is provided and structured by mothers' cultural model (a consistent pattern of norms, values, and parenting behavior), which influences toddlers' development. Furthermore, this study provides empirical evidence that, to a certain degree, the same mechanisms account for intercultural and intracultural variation in maternal behavior and toddlers' development.

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