Attachment theory and culture: parenting in Latin America and rural Peru from an attachment theory perspective

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Chapter 6

Attachment theory´s core hypotheses in rural Andean Peru

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Abstract

This is the first study aiming to test attachment theory's core hypotheses within a rural sample from Cusco in the Peruvian Andes. A total of 69 mother and their children (6 to 36 months) participated. Child attachment security was assessed with the Attachment Q-set (AQS), maternal sensitivity was measured during three naturalistic episodes (free interaction, bathing, and feeding) with the Ainsworth sensitivity scale and the Maternal Behavior Q-sort (MBQS), and child development was evaluated with the Bayley-III Screening test. Results revealed that most children displayed low secure base behaviors in the interactions with their mothers, although not pervasively so. Furthermore, an association between maternal sensitivity and child attachment security was found, and child attachment security was positively related to child fine motor skills. In conclusion, these results from a rural Andean region provide support for some of attachment theory's universality claims, and suggest new avenues for research on assessment issues in rural samples in the Global South.

Keywords: attachment security, maternal sensitivity, attachment theory, Peru, rural Andes

Attachment theory claims to reflect universal processes that have been captured in four core hypotheses (van IJzendoorn, 1990). These assume that all children form an attachment bond with their primary caregiver (universality hypothesis), that the attachment bond will be predominantly secure (normativity hypothesis), that sensitive caregiving predicts secure attachment (sensitivity hypothesis), and that children with a secure attachment predict better positive child outcomes (competence hypothesis). Unfortunately, the vast majority of studies addressing attachment theory's core hypotheses are based on samples from western, educated, industrialized, rich, and democratic (WEIRD) societies (Henrich et al., 2010). Even though these hypotheses are assumed to be applicable outside of the Western world, and some studies have shown that they indeed apply in other regions, very few have studied them in rural areas in the Global South (in the past often referred to as non-Western regions). The current study was designed to contribute to fill this empirical gap, testing each hypothesis in mother-infant dyads in rural Andean Peru.

The attachment relationship refers to an affectional bond that an infant establishes with a specific caregiver, commonly the mother (Bowlby, 1969/1982, 1979). Attachment reflects a universal psycho-biological mechanism based on ethological and evolutionary considerations that contribute to infant survival (Bowlby, 1969/1982, 1979). This mechanism includes attachment and exploration behaviors (Cassidy, 2016; Bowlby, 1969/1982). On the one hand, attachment behaviors such as crying, smiling, differential tracking, etc., allow infants to promote proximity with their caregiver(s) (Cassidy, 2016). On the other hand, exploration behaviors such as engaging with the environment when it is safe allow infants to distance themselves from their caregiver (Cassidy, 2016; Bowlby, 1969/1982) and provide the scaffold for developing diverse skills (Magai et al., 2016). The attachment relationship is considered "secure" if there is a balance between attachment behaviors and exploration behaviors (Ainsworth, 1989; Bowlby, 1969/1982). In addition, sensitive responsiveness, one of the most studied aspects of attachment theory, is considered to be one of the most important determinants of secure attachment (De Wolff & van IJzendoorn, 1997; Bakermans et al., 2003), which in turn has been shown to be an essential precursor of adaptive functioning in later childhood (Thompson, 2016). Sensitive responsiveness refers to the ability of the caregiver to notice and interpret children's signals accurately and respond to those signals promptly and correctly (Ainsworth et al., 1978).

Attachment is supposed to have universal roots that can be understood from an evolutionary perspective, given that reliance on adult care is necessary for infant survival (Bowlby, 1969/1982; Ainsworth et al., 1978). This proposed universality of the primary attachment mechanisms has been captured in four core hypotheses (van IJzendoorn, 1990). First, the

universality hypothesis assumes that given the opportunity, and in the absence of neurodevelopmental problems, all infants will become attached to one or more specific caregivers. This hypothesis is based on the assumption that attachment is a biological imperative and the norm (Sroufe, 2021), and the only exception occurs in the absence of a consistent caregiver interacting with the infant, as in the famous case of Romanian orphans (Zeanah et al., 2005). Second, the normativity hypothesis states that in a non-life-threatening context, most infants will be securely attached to their caregiver. Third, the sensitivity hypothesis refers to the assumption that infants will be securely attached depending on caregiving features, in which the caregiver's sensitivity is central. Fourth, the competence hypothesis assumes that infants with a secure attachment will develop higher levels of socio-cognitive competence than infants with insecure attachment relationships (van IJzendoorn, 1990). Although the latter hypothesis was initially formulated for socio-cognitive development, recent studies have also looked at the positive effect of secure attachment to other child developmental domains (Mesman et al., 2016).

Even though there is evidence that the core hypotheses of attachment theory are applicable outside the Global North world (Fourment, Espinoza et al., 2021; Mesman et al., 2016; Voges et al., 2019), it is unclear to what extent such findings can be generalized to the reality of caregivers and infants in low-and middle-income rural populations (Voges et al., 2019). There is quite substantial inferred evidence for the universality hypothesis mainly in urban Global South samples in African and Asian countries (Mesman et al., 2016; Voges et al., 2019), as well as in Latin American countries such as Chile, Colombia, Mexico, Peru, and Brazil (Fourment, Espinoza et al., 2021; Mesman et al., 2016). In some way, these studies support the universality hypothesis by showing that children were attached to a preferred caregiver in all cases, including studies conducted with Latin American rural low-SES dyads from Chile and Mexico (Cárcamo et al., 2016; Gojman et al., 2012). For the normativity hypothesis, the same studies conducted mainly in urban Africa, Asia, and Latina America showed that most children were securely attached to the preferred caregiver, regardless of cultural context (Fourment, Espinoza et al., 2021; Mesman et al., 2016). Although secure attachment seems to be the norm across cultures, at least among populations without conditions that involve risk for typical development, some differences in the distribution of secure attachment can also be observed. The only two studies conducted with rural Global South samples, from Chile and Mexico, showed a lower presence of securely attached children (Cárcamo et al., 2016; Gojman et al., 2012).

The sensitivity hypothesis has been tested less often than the universality and normativity hypotheses but has been mostly supported in published studies addressing this issue. For

example, a review of cross-cultural studies showed some supporting evidence from African and Asian samples (Mesman et al., 2016). Similarly, a review of Latin American studies included samples from Colombia, Peru, Chile, Ecuador, and Mexico showed significant associations between sensitivity and attachment security, mainly within urban samples (Fourment, Espinoza et al., 2021). Although some studies within the Latin American literature have assessed sensitive behaviors in rural samples (Barone et al., 2020; Farkas et al., 2017; Fourment, Nóblega et al., 2021), only one of them have tested and supported the association between sensitivity and attachment security (Gojman et al., 2012).

Finally, the competence hypothesis has been tested only sporadically by research conducted outside of the Global North; therefore, cross-cultural evidence to support it is still insufficient. Studies had considered the competence hypothesis in a broader sense and had included other child outcomes, as nutritional status. There is some evidence that attachment security is related to a better nutritional status and adaptative functioning in Asia and Africa (Mesman et al., 2016). Most of the studies testing this relation in Latin America, including Chile, Mexico, Brazil, and Peru, showed that child attachment quality was significantly related to better social-cognitive competence and other child outcomes (Fourment, Espinoza et al., 2021).

Attachment-based observational studies are scarce in rural Global South communities. Although attachment theory research has increased within Latin American countries in recent years, this mainly includes urban samples (Fourment, Espinoza et al., 2021), primarily because urban samples are easier to reach and are more familiar with this type of study. To contemplate this is particularly relevant considering the fact that urban-rural division has been found to be bigger than the divide between urban centers in different parts of the globe, and it has been stated that families from rural areas tend to have more authoritarian and less child-centered parenting attitudes compared to urban ones (Bornstein et al., 2012). Despite these differences, there is a considerable lack of studies on parenting, mainly observational studies on attachment theory conducted in rural areas in the Global South.

This situation is also real for observational studies on attachment theory in Peru, a country located in the central-west of South America. Rural Andean Peru is characterized by high poverty levels and harsh living circumstances (Instituto Nacional de Estadística e Informática, 2020a). These Andean rural areas lack access to facilities and state government services, such as access to potable water, drainage networks, electrical power, and healthcare facilities (Instituto Nacional de Estadística e Informática, 2020b). At the same time, the population tends to suffers from ethnic and social discrimination, including marginalization in the job market (hiring and income), limited access to health services, education, and public agencies services

(Santos, 2014). Studies have found that marginalization and discrimination can harm individual and family well-being (Schmitt et al., 2014; Valdivia et al., 2007). Relatedly, studies in other communities have found that stress and marginalization due to economic pressures and parental worries can negatively influence maternal sensitivity (Bakermans-Kranenburg et al., 2004; Emmen et al., 2013), which in turn can affect child secure attachment and later correlates.

To our knowledge, there are no observational studies that have tested the core attachment hypotheses in rural Andean Peru. The five relevant studies using standardized methods to assess attachment, sensitivity, and/or a child developmental outcome in Peru included only urban samples. No studies in Peru have explicitly addressed the universality hypothesis, mainly because there are no clear measures to establish the absence of an attachment relationship as its presence is usually assumed. Even in the Romanian orphans' study, all children were successfully classified into one of the traditional ABCD categories, and it was only an additional scale that revealed patterns suggesting a lack of attachment or attachment disorders (Zeanah et al., 2005). Therefore, with our current state of attachment research and measures, this hypothesis cannot be easily tested, leaving us the other three hypotheses to be tested.

Studies examining the quality of child secure attachment, relevant for testing the normativity hypotheses, have shown mixed results. Average secure-base behavior scores derived from the Attachment Q-Sort in all four studies were positive: .20 (*SD* = .24; Nóblega et al., 2016), .26 (*SD* = .26; Nóblega, Bárrig & Fourment, 2019), .31 (*SD* = .26; Posada et al., 2016), and .36 (*SD* = 22; Wachs et al., 2011). Three out of four samples had average security scores lower than the mean reported in the most recent meta-analysis (.35, 95% CI [.34, .37]); Cadman et al., 2017). The only study assessing secure attachment representations using the ASCT reported a predominance of a secure base script (Nóblega, Bárrig-Jó et al., 2019). The association between sensitive behavior and secure attachment, that is to say the sensitivity hypotheses, has been tested and supported in three samples of infant-mother and child-mother dyads (Nóblega, Bárrig & Fourment, 2019; Nóblega et al., 2016; Nóblega, Bárrig-Jó et al., 2019). Finally, the association between child secure attachment and child developmental outcomes (i.e., nutritional status and social competence), namely the competence hypotheses, has been tested and confirmed in two studies (Nóblega Bárrig-Jo et al., 2019; Wachs et al., 2011).

The current study aims to examine whether three out of four core hypotheses of attachment theory apply to a sample of infant-mother dyads from rural Andean Cusco in Peru. This is the

first study examining whether (a) the children's attachment bond with its mother is secure in the majority of children, (b) maternal sensitivity is related to child attachment security, and (c) child attachment security is related to more positive child development.

Method

Participants

The sample consisted of 69 mothers with their 6-36-month-old children living in a rural Andean area in the Cusco region, Peru. Table 1 presents the main sociodemographic characteristics of participating dyads. Thirty-five of the children were boys (50.1%). The majority of children (68%) had one or two caregivers (only the mother or the mother and an additional one: in twelve cases the father, in eleven the grandmother, in seven an older sister, in one case an aunt, and in four cases a non-familiar caregiver). The remaining 32% had between 3 to 5 caregivers (including the mother). Thirty-six percent of children were the only child, 35% had one sibling, and the remaining had between 2 to 5 siblings.

TABLE 1 Sociodemographic characteristics of participating dyads.

Variables	M (SD)	Range
Child age (in months)	16.22 (7.78)	6-36
Mother age (in years)	28.43 (7.06)	17-44
Total number of child caregivers	2.29 (.96)	1-5
Mother number of children	2.20 (1.32)	1-6
Mother years of education	9.84 (3.71)	0-17
Number of close people for support	2.88 (1.93)	0-12
Family SES level	1.52 (.86)	1-4

The mean age of mothers was 28.43 years (*SD* = 7.06, range 17 to 44 years). The majority of them (90%) were together with the father of the focus child (married or cohabitant). Seventy-eight percent of mothers mentioned their main occupation was maintaining the house and/or working their land and tending to their livestock. Around a fifth of mothers (22%) had a low educational level (no education, incomplete or complete primary school), 43% had incomplete or complete high school, and only 3% graduated from university. Around half of the mothers (52%) had only one or two close friends or family for social support; the remaining half had between 3 and 12. Most dyads (88%) belonged to the lowest SES levels (1 and 2) and the remaining 12% to levels 3 and 4 (on an 8-point scale).

Procedures

Dyads were contacted with the help of local community leaders and by references of participating mothers themselves through snowball recruitment. The Peruvian research team included four research assistants (one from the capital city and three from the same rural Andean area) under the guidance of the first author (also from Peru). During the first visit, all mothers, and in some cases also fathers, were informed about the purpose of the study, including the information that was going to be collected and the possible number of visits. Thirty-two mothers declined to participate in the study, mainly due to a lack of time to program the visits, although some mentioned the husband did not want them to participate. The response rate was 68%, which is rather high for a study based on video observations at home in a rural Andean area. Once they agreed to participate in the study, they provided informed consent (written or verbal). Dyads received, on average, five visits (three to seven depending on the availability of the dyad), and they all received some basic food supplies as acknowledgment at the end of each visit. The ethics committees from two universities (one in Peru, one in the host country of the first author) approved the current study protocol.

Mothers and their children were videotaped during three naturalistic episodes (i.e., free interaction, bathing, and feeding). The free interaction episode was used to independently assess maternal sensitivity and child attachment security. In the three episodes, the instructions to the mother were to do what they usually do and try to ignore our presence. All home visits were scheduled when mothers and children were available, and if necessary, they were rescheduled (e.g., because of cold weather for bathing, the child fell asleep, a member of the dyad was indisposed, etc.). Free interaction, bathing, and feeding episodes were mainly observed at home following the dyad outside if they moved around. However, in some cases, observations were conducted where mothers indicated they would habitually conduct the activity (i.e., grandparents' house or store where the mother works). The average duration of the free interaction video observation was 54 minutes (range 38 to 62 minutes), 15 minutes (range 6 to 29 minutes) for the bathing video observation, and 10 minutes (range 2 to 29 minutes) for the feeding video observation. It was not possible to code the feeding episode in six cases because there were less than two minutes of dyadic interaction. Mothers also answered to some questionnaires and brief interviews. In all cases, child development was assessed at the final part of the last visit and was conducted solely by either one of the research assistants or the first author, both clinical psychologists with experience in assessing young children.

Measures

Maternal sensitivity

Maternal sensitivity was assessed based on videotapes of three naturalistic episodes (i.e., free interaction, bathing, and feeding) and two measures: The Ainsworth sensitivity scale (Ainsworth et al., 1974) and the Maternal Behavior Q-sort (Pederson et al., 1999). This resulted in six scores for sensitivity for each participant, assigned by coders who were blind to the other five scores.

Ainsworth sensitivity scale (Ainsworth et al., 1974) assesses caregivers' ability to perceive and interpret child's signals accurately and respond to them promptly and appropriately and consists of a 9-point scale (1-9, highly insensitive to highly sensitive). Scores from 5 up are considered sensitive caregiving. The three video episodes (free interaction, bathing, and feeding) were coded by three independent coders, following the completion of a reliability set of 28 videos of mothers and children from the rural Andean area. Intercoder reliability (intraclass correlation ranged from .74 to .86 (M = .81). Once all videos were coded, discrepancies reflecting low (1 to 3) and high (7 to 9) scores for different episodes within cases were identified for 11 cases. Two coders checked for procedural or coding mistakes, leading to changes in one or more scores for seven cases. In the remaining four cases, the discrepancies between episodes reflected real differences in the mother's sensitivity between episodes.

The Maternal Behavior Q-Sort 3.1 (MBQS; Pederson et al., 1999) was also used to code the free interaction episode. The MBQS describes 90 caregivers' behaviors that are printed on cards. Coders sort the items in nine stacks of 10 cards, ranging from 1 - least characteristic to 9 - most characteristic. The final score is calculated by correlating the coder's description with the criterion sort that reflects the highly sensitive mother, ranging from -1 to 1 and reflecting the degree of similarity with the criterion sort. Higher scores indicate a higher degree of sensitive behavior. Two reliable and trained coders rated the free interaction episode. Twenty-nine percent (n = 20) of the set of videos were double-coded for reliability checks, and intercoder reliability (intraclass correlation) was .84. Finally, the Mini Maternal Behavior Q-Sort video revised (Mini-MBQS-VR; Moran, 2009), a shortened version of the regular MBQS, was used to code the bathing and feeding episodes. This measure consists of 25 items sorted by the coder in five stacks and ranged from 1 - least characteristic to 5 - most characteristic. The coder's description is correlated to the same criterion sort as the MBQS, and higher correlations indicate a higher degree of sensitivity. A group of four reliable and trained coders

rated the bathing and feeding episodes, two independent coders for each situation. A part of the set of videos were double-coded, approximately 30% (n = 21) for bathing and 25% (n = 16) for feeding. The intercoder reliability (intraclass correlation) was .76 for bathing and .93 for feeding. Once all videos were coded, 26 cases with discrepancies between low (-1 thru .33) and high (.68 thru 1) scores between episodes within participants were reviewed. Two coders checked for procedural or coding mistakes, leading to changes in one or more scores for 8 cases. In the remaining 24 cases, the discrepancies between episodes reflected real differences in the mother's behavior between episodes.

For the current study, we used a composite score reflecting overall maternal sensitivity. We first replaced the six missing Mini-MBQS feeding scores with the average scores from the two other observed situations (free interaction and bathing). Then we standardized the Ainsworth scale free interaction, bathing, and feeding observations scores and the MBQS free interaction, bathing, and feeding observations scores. After that, the sum-up of the six Z-scores was computed, and the resulting composite was used in subsequent analyses. The values of this composite score ranged from -8.20 to 9.36, with higher scores indicating higher maternal sensitivity.

Child attachment security

Child-mother attachment security was assessed with the Attachment Q-set (AQS; Waters, 1995). The AQS describes 90 child behaviors (printed on cards) that the coder sorts in nine stacks of 10 cards, ranging from 1 – least descriptive of the child to 9 – most descriptive of the child. The final child attachment security score is calculated by correlating the coder's description with the criterion sort of the hypothetically secure child (Waters, 1995). This final score ranged from -1 to 1 and reflects the degree of similarity with the criterion sort, with higher scores indicating a higher degree of attachment security. Although child attachment security is supposed to be assessed from 12 months onwards, the AQS has been previously used with young children, including samples of 6-, 8-, and 10-month-old infants (Nóblega et al., 2016; Ortiz et al., 2006; Posada et al., 2002, 2004). In these studies, the observed behaviors were interpreted as indicators of a child's attachment security and, in all cases, were significantly related to maternal sensitivity (rs .40 - .46, ps < .05). Three trained and reliable coders rated all videos. The training was conducted by the Peruvian research team with urban and rural sample material. In the current study, the intercoder reliability (intraclass correlation), using 16 videos (23% of the sample), ranged from .76 to .82 (M = .79).

Child development

The Bayley Scales of Infant and Toddler Development Screening Test Third Edition (Bayley-III Screening Test; Bayley, 2006) assessed child development. This short version comprises items from the full Bayley Scales of Infant and Toddler Development, Third Edition. This measure is intended for children aged between 1 and 42 months, and it assesses three broad developmental domains: cognitive (33 items), language (48 items), and motor (55 items). The language domain consists of receptive (24 items) and expressive (24 items) communication subtests, and the motor domain is composed of fine (27 items) and gross (28 items) motor subtests.

The Bayley-III Screening Test can be administered in 15 to 25 minutes, and each of the 136 items is scored as "1-passed" or "0-not passed". The progression or regression within each subtest followed the reversal and discontinue rules. The reversal rule requires a "passed" score on the first item at the age start point to go forward. If the score is "not passed" on the first item, the assessment recedes to the previous age range until meeting the rule. The discontinue rule implies termination of the assessment when the child obtains "not passed" scores on four consecutive items. Considering cross-cultural differences, normative data and cut scores were not used, but final gross subtests scores were used in the present study. Due to the (expected) high correlation of subtest scores with children's age (between .86 and .93, all p-values < .001), scores were controlled for age, and the standardized residuals were used as final scores for subsequent analyses.

Sociodemographic information

Mothers completed a sociodemographic questionnaire that collected information regarding the mother and the child. Registered information comprised child's sex, child's age, and the number of child's caregivers. As well as mother's age, mother's level of education, mother's marital status, and mother's number of children.

Family socioeconomic status

The Socioeconomic status classification interview (APEIM, 2017) was used to assess family socioeconomic status. This standardized formula is based on a set of relevant variables to the Peruvian contexts and considered information about the head of the residence's family and

features and facilities. The specific considered variables and the corresponding scores are (1) head of household educational level (up to 7 points) and affiliation to health care system (up to 6 points); (2) dominant features of the dwelling: floor (up to 8 points), external walls (up to 6 points), and toilet system as indicative of running water (up to 5 points); (3) goods and services, such as a car for private use (5 points), and domestic help (5 points); and (4) household appliances related to access to electricity, such as computer, refrigerator, washing machine, and microwave (2 points per item). Scores range from 0 to 50. A score of 12 or fewer points represents the lowest SES level "8" while a score of 48 or more the highest SES level "1". For the present study, the variable was reversed for subsequent analyses, with the score "1" representing the lowest and the score "8" representing the highest SES level.

Perceived social support

The maternal perceived social support was assessed with the Social Support Survey (MOS; Sherbourne & Stewart, 1991) in its adapted Spanish version (Rodríguez & Enrique, 2007). This questionnaire assesses the availability that the mother perceives from her social network. The survey is composed of 20 items. The first one is a descriptive item that evaluates the structural support (number of people the mother perceives as supportive). The remaining 19 items assess the perceived functional support on a five-point Likert scale, ranging from 1-never to 5-always, providing a global score on the frequency of perceived social support. The survey is usually self-administered, however considering educational levels and possibly reading limitations, mothers responded to the survey as an interview. The evaluator asked for the 20 items one by one and recorded the mother's responses. To help the mothers, a picture with possible answer options was placed in front of mothers during the interview to refer to it during the evaluation. For the present study, the internal consistency was .86.

Daily worries

An average daily worry variable was computed. This is a descriptive variable based on the mother's worries that she experiences in her everyday life. The questionnaire comprises 11 specific daily life topics that could concern the mother on a range from 1-not at all worried to 4-very worried. The considered topics are related to health and death, education, money, marital problems including violence and alcoholism, harvest problems, and difficulties finding a job. Topics were defined after initial contact with the communities before starting the study. During this initial contact, we piloted a perceived stress scale that unfortunately did not work well in this sample, in that mothers often did not understand the questions. Therefore, we

decided to build this variable. The selected topics were then verified with the assistant researchers from the area and mothers who were not participating in the study. As for the social support survey, this instrument was administered as an interview. The evaluator presented the 11 items and recorded the mother's responses. Mothers were also presented with a picture with possible options as reference. Internal consistency for the present study was .68.

Cumulative risk variable

A cumulative risk variable based on the number of risk factors was computed to represent sociodemographic maternal risk. Seven dichotomous sociodemographic maternal risk factors were considered. A score of 0 or 1 was assigned respectively for the absence or presence of the following risk factors: belonging to the lowest SES level (level 1), having more than one child, children with only one or two caregivers, high average of daily worries (>2.41), low average of social support (<3.35), low level of education (i.e. no education, primary school, or unfinished secondary school), and only one or two close friends and family for support. Possible values ranged from 0 to 7, with higher scores indicating greater risk. Only four mothers scored 0 in this variable.

Results

Descriptive statistics for the main study variables included in this study are displayed in Table 2. Regarding the normativity hypothesis, although the AQS does not yield attachment classifications, the mean score of child attachment security was positive .15 (*SD* = .26, 95% CI [.08, .21]), and that the majority of children (71%) received a positive score, with only 20 children (29%) on the negative side of the punctuation. There was no significant difference (*p* = .63) in attachment security between the youngest children (age 6 to 11 months; *M* = 13, *SD* = .27) and the oldest children (12 to 36 months; *M* = 16, *SD* = .26).

TABLE 2 Descriptive statistics for main study variables.

	Range	M	*SD*
Maternal sensitivity composite	-8.20-9.36	0.00	3.86
Child attachment security	-0.46-0.70	0.15	0.26
Cumulative risk variable	0.00-7.00	3.97	1.97
Child development			
Cognitive	-3.11-1.99	0.00	0.99
Receptive communication	-3.11-2.01	0.00	0.99
Expressive communication	-3.20-2.35	0.00	0.99
Fine motor	-3.19-2.57	0.00	0.99
Gross motor	-1.98-2.50	0.00	0.99

Note. Standardized score and standardized residuals were used for maternal sensitivity composite and child development subtests; therefore, mean scores and standardized deviation are 0.00 and 0.99, respectively.

To explore which specific manifestations of child attachment security were the most discrepant between the sample mean and the criterion sort, we identified the items with means scores with a difference of three points or higher (a third of the possible score range). As shown in Table 3, compared to the criterion sort, children in the current sample were characterized as less likely to show secure-base behaviors, such as using their mother as a base from which to explore. Additionally, these children were described as less prone to show affective sharing and compliance in the interaction with their mothers, as being less likely to follow mothers´ indications and suggestions, nor using mothers´ facial expressions as a source of information. Finally, these children seem to be described more than expected as fussy and difficult to interact with. It is important to highlight that most of these items had scores between 4 and 6, and these middle scores are usually used for not applicable or not observed situations.

Table 4 presents the correlations between the main variables. Regarding the sensitivity hypotheses, we found that maternal sensitivity was positively related to child attachment security (r = .34, p = .004). We also explored the association of the six separate sensitivity measures (three episodes, two measures) and five other composites (three across measures within episodes and two across episodes within measures) with attachment security. Results showed that seven out of these 11 correlations were significant (rs .25 - .34, ps .004 - .04). However, maternal sensitivity was not significantly related to child attachment when looking at any of the bathing sensitivity scores (separate measures or composite, ps .11 - .16) nor for the feeding episode assessed with the Ainsworth scale (p = .26).

TABLE 3 AQS behaviors that most differ from the criterion sort

Item	Observed behavior	Criterion sort	Group mean	Difference
88	When something upsets the child, he stays where he is and cries. Low: Goes to mother when he cries. Doesn't wait for mom to come to him.	1.20	6.00	4.80
86	Child tries to get mother to imitate him, or quickly notices and enjoys it when mom imitates him on her own. Low: Doesn't show any particular interest in this such engagement.	6.50	1.72	4.78
34	When child is upset about mother leaving him, he sits right where he is and cries. Doesn't go after her. Middle: If never upset by her leaving. Low: Actively goes after her if he is upset or crying.	1.20	5.30	4.10
80	Child uses mother's facial expressions as good source of information when something looks risky or threatening. Low: Makes up his own mind without checking mother's expressions first.	8.50	4.43	4.07
42	Child recognizes when mother is upset. Becomes quiet or upset himself. Tries to comfort her. Asks what is wrong, etc. Low: Doesn't recognize; continues play; behaves toward her as if she were OK.	8.20	4.17	4.03
81	Child cries as a way of getting mother to what he wants. Low: Mainly cries because of genuine discomfort (tired, sad, afraid, etc.).	1.80	5.70	3.90
36	Child clearly shows a pattern of using mother as a base from which to explore. Moves out to play; Returns or plays near her; moves out to play again, etc. Low: Always away unless retrieved, or always stays near.	8.80	5.16	3.64
73	Child has a cuddly toy or security blanket that he carries around, takes it to bed, or holds when upset. Low: Can take such things or leave them, or has none at all.	5.20	1.58	3.62
70	Child quickly greets his mother with a big smile when she enters the room. (Shows her a toy, gestures, or says "Hi, Mommy"). Low: Doesn't greet mother unless she greets him first.	8.00	4.51	3.49
90	If mother moves very far, child follows along and continues his play in the area she has moved to. (Doesn't have to be called or carried along; doesn't stop play or get upset.) Middle if child isn't allowed or doesn't have room to move very far away. Low: Child may or may not continue play but does not adjust location when mom moves.	8.30	4.88	3.42
18	Child follows mother's suggestions readily, even when they are clearly suggestions rather than orders. Low: Ignores or refuses unless ordered.	8.50	5.14	3.36

14	When child finds something new to play with, he carries it to mother or shows it to her from across the room. Low: Plays with the new object quietly or goes where he won't be interrupted.	7.80	4.45	3.35
38	Child is demanding and impatient with mother. Fusses and persists unless she does what he wants right away. Low: Child waits a reasonable time if mother doesn't respond immediately.	1.20	4.54	3.34
2	When child returns to mother after playing, he is sometimes fussy for no clear reason. Low: Child is happy or affectionate when he returns to mother between or after play times.	1.80	5.12	3.32
41	When mother says to follow her, child does so. Low: Child ignores or refuses.	8.50	5.20	3.30
74	When mother doesn't do what child wants right away, child behaves as if mom were not going to do it at all. Low: Waits a reasonable time, as if he expects mother will shortly do what he asked.	1.50	4.80	3.30
69	Rarely asks mother for help. Middle if child is too young to ask. Low: Often asks mother for help.	2.30	5.59	3.29
25	Child is easy for mother to lose track of when he is playing out of her sight. Middle if never plays out of sight. Low: Talks and calls when out of sight. Easy to find; easy to keep track of what child is doing.	2.00	5.29	3.29
79	Child easily becomes angry at mother. Low: Doesn't become angry at mother unless she is very intrusive or he is very tired.	1.00	4.28	3.28
55	Child copies a number of behaviors or way of doing things from watching mother's behavior. Low: Doesn't noticeably copy mother's behavior.	7.00	3.91	3.09
32	When mother says "No" or punishes him, child stops misbehaving (at least at that time). Doesn't have to be told twice. Low: Child persists in misbehavior.	7.20	4.13	3.07
28	Child enjoys relaxing in mother's lap. Middle: If child never sits still. Low: Prefers to relax on the floor or on furniture.	7.50	4.43	3.07

Regarding the competence hypothesis, in its broader sense, Table 4 shows that child attachment security was positively associated with child fine motor skills (r = .26, p = .03). No other significant associations were found between child attachment and maternal sensitivity on the one hand and child developmental outcome variables on the other hand. Additionally, the cumulative risk variable was significantly negatively related to the maternal sensitivity composite (r = -.26, p = .03), but not to child attachment security (r =.02, p = .89). There was a significant indirect effect (using PROCESS model 4, basic mediation) of the cumulative risk variable on child attachment security through maternal sensitivity, b = -.013, CI [-.026, -.002], although this represented a small effect, k^2 = -.099, 95% CI [-.190, -.012]. Finally, all child developmental outcome variables were intercorrelated (rs .27 - .64, ps < .05), except for child expressive communication skills and fine motor skills.

TABLE 4 Correlations between main study variables.

	Variables	1	2	3	4	5	6	7
1.	Maternal sensitivity composite	-						
2.	Child attachment security	.34**	-					
3.	Cumulative risk variable	-.26*	.02	-				
4.	Cognitive	.18	.09	-.06	-			
5.	Receptive communication	.17	.18	-.07	.49***	-		
6.	Expressive communication	.20	.17	-.12	.45***	.64***	-	
7.	Fine motor	.04	.26*	-.06	.52***	.45***	.40**	-
8.	Gross motor	.10	.14	.13	.47***	.44***	.23	.27*

*p < .05, ** p < .01, *** p < .001.

Discussion

The current study tested three out of four core hypotheses of attachment theory in a sample of infant-mother dyads from Cusco in rural Andean Peru. Results showed that most children displayed low secure-base behaviors in interactions with their mothers. Additionally, an association between maternal sensitivity and child attachment security was observed, and child attachment security was positively associated with child fine motor skills. These findings give some support to the applicability of attachment theory's core hypotheses outside of urban Western regions, particularly within a rural Peruvian Andean sample. However, some cultural specificities need to be considered when interpreting these results.

Regarding the normativity hypothesis, it is clear that children did not overwhelmingly fit the traditional secure attachment pattern according to the AQS criterion sort. Child attachment security average scores of this rural Andean sample were the lowest found in studies conducted in Peru (Nóblega et al., 2016; Nóblega, Bárrig & Fourment 2019; Posada et al., 2016; Wachs

et al., 2011). Likewise, child attachment security levels from the current research were lower than the mean rating reported for groups of Brazilian (Bortolini & Piccinini, 2018), Ecuadorian (Diaz et al., 2018), Colombian (Posada et al., 2016), and Mexican children (Salina-Quiroz, 2015). Additionally, no significant differences were found between the youngest and oldest children groups, rejecting the hypothesis that including young children in the current sample could have lowered child attachment security scores.

We explore two potential explanations for the findings regarding attachment security: one reflecting on the harsh living circumstances of the sample, and one related to the suitability of the AQS for this sample.

Considering the poor living circumstances in this economically deprived rural area in Peru, low levels of attachment security may not be surprising. This pattern is consistent with attachment theory, which posits that safe and healthy contexts will more easily fulfill the normativity hypothesis than those characterized by high-risk circumstances (van IJzendoorn, 1990). Two previous studies conducted with the Strange Situation Procedure (SSP) in similar samples in terms of risk (a rural poor Mexican sample, Gojman et al., 2012; and an undernourished Chilean sample, Valenzuela, 1997) also found a low prevalence of secure attachment, but not as low as in the current study. It is unclear whether the extremely low security scores in the current sample can be fully explained by the socioeconomic context, given that the families' living circumstances are not more severe than those of other rural samples with higher rates of security.

The current study is different from previous studies with rural low-SES samples regarding the instrument used (AQS instead of the SSP) in combination with a rather particular setting in terms of characteristics of the families' homes. The AQS, contrary to the SSP, relies on naturalistic observations without an explicit stressor to elicit secure-base behaviors. This might be why some relevant secure-base behavior items were scored in middle ranges (rather than high or low). Scores assigned could be related to the lack of occurrence of the relevant situations required to assess the specific behavior. Additionally, positive affect and warmth are less prominent in rural non-Western contexts (Dawson, 2018; Mesman et al., 2018), which might explain why the child's emotional tone when relating with the mother is not characterized by children actively initiating interaction clearly expressing pleasure or enjoyment. Similarly, physical contact between mother and child within the home could be less present, as houses usually include big walled-off outside areas that enable the child to wander away from mother while still being within a safe environment. These issues illustrate

that some AQS items do not necessarily apply to scoring child attachment security within this rural Andean sample.

In relation to the sensitivity hypothesis, maternal sensitivity was positively related to child attachment security, indicating that, as expected, there is a relation between the ability of the mother to sensitively respond to infants' signals and the development of a secure base relationship with the mother. Previous studies conducted in urban Peru and other Latin American countries have found similar correlations (Nóblega et al., 2016; Nóblega, Bárrig & Fourment, 2019; Posada et al., 2002, 2016), confirming the tendency of maternal sensitive behaviors to be related to child attachment behaviors. Considering that the average scores for child attachment security and maternal sensitivity were low, this finding shows that even under these harsh circumstances, variations within maternal sensitivity levels are still meaningfully related to variations in child attachment security.

Furthermore, a negative correlation between maternal sensitivity and the cumulative risk variable was found. This findings shows that even in a context of generally high levels of risk, variations within that realm are still meaningfully related to variation in parenting quality, which is consistent with findings from other studies in samples with overall high levels of risk such as those in slums in Yemen (Alsarhi et al., 2021) and Indonesia (Rahma et al., 2021). Although this cumulative risk variable was not directly related to child attachment security, the adverse conditions were related to lower maternal sensitivity, which in turn was related to lower levels of children's secure base behaviors in the interactions with their mothers.

The results related to the competence hypothesis partly confirms that there is association between child-mother attachment security and children's more positive development in this particular rural Andean context. Child attachment security was found to be related to the child's fine motor skills. However, no significant relation was found between child attachment security and child´s gross motor skill, child´s receptive and expressive communication, and child´s cognitive development. Nevertheless, all correlations between attachment security and child outcomes were in the expected direction. The lack of statistical significance may have been due to the relatively small sample size.

The present study has several strengths and also some limitations. As the first study of its kind within a rural Andean sample in Peru, a region usually not represented in video observation studies of parenting, the current study contributes to the literature on the universality versus culture-specificity of attachment theory. The core hypotheses of attachment theory were tested using well-validated observational measures, and a robust measure of maternal sensitivity was

used including insights from multiple instruments and situations. Unfortunately, we did not include child social competence measures in this study, limiting conclusions about the competence hypothesis. The original competence hypothesis focuses on child social development, but the social competence measures we piloted in this sample proved to be inappropriate for this sample due to the high level of abstraction of the mother-report items, and were therefore left out. For future research, efforts need to be made to find an alternative way of measuring social competence.

Additionally, regarding child attachment security, we suggest avenues for future research to understand the patterns found in the current sample. First, more extended observations might enhance the opportunity to observe a broader range of behaviors, such as separations and child distress. In addition, approaching from an ethnographic perspective could provide more in-depth descriptions of mother-child interactions that might give a better sense of the daily manifestations of (in)secure attachment that may be more relevant to measure attachment within this sample. Indeed, the cross-cultural validity of attachment theory and its methods, particularly when it comes to rural non-Western populations has been questioned and might require other approaches (Keller, 2021; Mesman, 2021). Therefore, we need to leave open the possibility that the construct of secure attachment, as defined and assessed in the current study, may be less appropriate for this sample of children.

In conclusion, this study adds to the body of knowledge regarding the universal and culture-specific aspects of attachment theory and its measures, particularly in rural settings in the Global South. Disentangling socioeconomic, cultural, and methodological factors to understand extreme findings regarding attachment's main concepts represents the main challenge for future work. Our findings do suggest that sensitive caregiving (in its local manifestation) can be instrumental for fostering secure attachment. This is consistent with the Peruvian government policy "Infancy first" (Ministerio de Desarrollo e Inclusión Social, 2019) that prioritizes sensitive behavior and secure attachment as crucial to the first five years of childhood. To ensure that such policies are appropriate to the local situation, innovative scholarly work is needed to more foster a culturally inclusive approach to attachment theory and practice.

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