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Maternal Sensitivity and the Behavioral and Representational Aspects of Attachment in Preschoolers: A Longitudinal Study

Sensibilidad Materna y los Aspectos Comportamentales y Representacionales del Apego en Preescolares: Un Estudio Longitudinal

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The study explored the relationships between maternal sensitivity, secure base behaviour (SBB) and secure base script representations (SBSR) in 34 mother-child dyads in Lima-Peru assessed at two points in time during the preschool stage. The hypothesis of the study was that maternal sensitivity would have a direct relationship with the SBSR (representational aspect of attachment), as well as an indirect relationship, through the SBB (behavioural aspect of attachment). The sample selection was purposive. At the first time point of the study, the children were on average 45.26 months old (*SD* = 7.132) and at the second time point they were 58.09 (*SD* = 7.025) months old. The Behavior for Preschoolers Q-Set (MBPQS) was used to assess maternal sensitivity, the Attachment Q-Set (AQS) to assess SBB and the Attachment Story Completion Task (ASCT) to assess SBSR. Path analysis was performed. Results indicate that maternal sensitivity, measured at the first time point, has a direct relationship with children's SBSR at the second time point. In addition, maternal sensitivity has an indirect effect on SBSR through SBB measured at the first time point. This study is pioneering in the Peruvian and Latin American context and opens a line of research that deepens the longitudinal relationship between these constructs of attachment theory. However, the results are preliminary given the small size of the participant sample.

Keywords: Sensitivity, attachment, attachment representations, secure base, preschoolers

El estudio exploró las relaciones entre la sensibilidad materna, la conducta de base segura (CBS) y las representaciones del guión de base segura (RGBS) en 34 díadas madre-hijo o hija de Lima-Perú evaluadas en dos momentos durante la etapa preescolar. La hipótesis del estudio fue que la sensibilidad materna tendría una relación directa con las RGBS (aspecto representacional del apego), así como una relación indirecta, a través de las CBS (aspecto comportamental del apego). La selección de la muestra fue intencional. En el primer momento de estudio, los niños y niñas tenían en promedio 45,26 meses de edad (DE = 7,132) y en el segundo momento tenían 58,09 (DE = 7,025). Para medir la sensibilidad materna se utilizó el Behavior for Preschoolers Q-Set (MBPQS), el Attachment Q-Set (AQS) para evaluar la CBS y el Attachment Story Completion Task (ASCT) para evaluar las RGBS. Se realizó un análisis de senderos. Los resultados indican que la sensibilidad materna, medida en el primer momento, tiene una relación directa con las RGBS de los niños y niñas en el segundo momento. Además, la sensibilidad materna tiene un efecto indirecto sobre las RGBS a través de la CBS medida en el primer momento. Este estudio es pionero en el contexto peruano y latinoamericano y abre una línea de investigación que profundiza en la relación longitudinal de estos constructos de la teoría del apego. Sin embargo, los resultados son preliminares dado el tamaño pequeño de la muestra participante.

Palabras clave: sensibilidad, apego, representaciones de apego, base segura, preescolares

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Maternal sensitivity has been identified in theory and research as an important antecedent of secure attachment; thus, it has a direct and moderate relationship with secure base behaviour (SBB), which is the main manifestation of secure attachment during the first years of life (Deans, 2020). It is also known that as the child moves into and through the preschool stage, the characteristics of attachment become more complex and cognitive or representational expressions of attachment become more important, as *script-like attachment representations* (SBSR, Marvin & Britner, 2008). However, so far, research on the developmental process of these scripts and their relationship with other components of dyadic behaviour - such as maternal sensitivity and the child's SBB - is scarce and sometimes shows contradictory results (Posada et al., 2018). Therefore, this study addressed the relationships between maternal sensitivity and SBB measured at one point in time, and SBSR assessed one year later, during the preschool stage.

Maternal sensitivity, i.e. the mother's ability to perceive, interpret and respond appropriately and in a timely manner to the child's signals (Ainsworth, 1978), has been described as the main factor associated with children's attachment to their mothers.

This behaviour that the mother displays with a particular child has been associated with environmental and contextual factors, such as the mother's socio-economic status (SES) and educational level. Thus, for example, according to Magnuson and Duncan (2019), mothers with higher SES and mothers who work fewer hours are more present in the home, which could favour greater sensitivity in the interaction with their children. Likewise, lower SES is associated with greater stress, which usually implies less time and cognitive resources available for the exercise of the parental role (Guryan et al., 2008; Kalil et al., 2012; Sayer et al., 2004). Thus, stress, associated with low SES, is a risk factor for parenthood in general, as well as for sensitive behaviour in particular. Other studies show that the mother's educational level is the best predictor of sensitivity (Hyche et al., 1992; Thomson et al., 2014). Pelchat et al. (2003) conclude that mothers with higher education and higher family income tend to develop greater sensitivity to their babies' needs.

On the other hand, some studies also suggest that maternal sensitivity varies according to the mother's age since, at an older age, women would have more experiences and, therefore, more information about the world and interpersonal relationships. These experiences would provide them with greater inputs to respond to their children's needs (Lamb et al., 2013; Sroufe, 2005; Sánchez & Hidalgo, 2002).

From the perspective of attachment theory, the sensitivity hypothesis postulates that having a sensitive mother throughout the first year of life contributes to the child developing a secure attachment (Ainsworth, 1978). This relationship has been corroborated by different studies and in diverse contexts, including the Peruvian (Bigelow et al., 2010; Gartstein & Iverson, 2014; Nóblega et al., 2016, 2019; von der Lippe et al., 2010; Wille, 2010). However, most of these studies highlight the link between maternal sensitivity and SBB, while studies linking sensitivity to the mental representations of attachment that the child develops during the preschool and post-school years are scarce.

It has been described that as the child enters the preschool stage, the attachment becomes more complex, due to physical, cognitive, linguistic and social changes that reorganise the expression of attachment (Bowlby, 1988; Bretherton & Munholland, 2008; Cicchetti et al., 1990; Marvin & Britner, 2008). Therefore, as the preschool child develops symbolic capacity, they come to understand that their attachment figures have different goals from theirs. This enables them to recognise the necessity of adjusting their own goals and those of their mother in order to maintain a balanced attachment relationship (Bowlby, 1982).

Along these lines, the most important change at this stage is the internalisation of attachment patterns in the form of mental representations (Bretherton & Munholland, 2008). It is for this reason that, in this age period, research incorporates the representational dimension of the attachment through the study of the so-called *internal working models* or mental representations of attachment (Bowlby, 1973). These are cognitive structures that summarise the person's conception of him/herself and the environment around him/her, including his/her attachment figures (Bowlby, 1972, 1973). These models are not static representations, they are constantly nourished by new experiences and have the characteristic of allowing the person to operate or work from them, in such a way that he/she can have a notion of what is happening in the present or what might happen in the future, based on the information they contain (Bowlby, 1973; Bretherton, 1985).

Different authors have proposed a progressive evolution of these representations, ranging from a simple structure and basically procedural contents to a more complex one that includes autobiographical memories (Waters et al., 2017).

Thus, at the base of the construction of these representations are the SBSR (Waters et al., 2021; Waters & Waters, 2006), which constitute more specific schemas in the form of action scripts or primitive narratives, which develop from the first months of life (Bakermans-Kranenburg, 2006). Thus, before the age of two, children are able to encode and remember sequences of actions that, over time and with further language development, become mental action schemas with a temporal-causal structure and take the form of stable sequences of behaviour that can be used to interpret and predict everyday situations (Bauer & Fivush, 2014).

Waters & Roisman (2019) posit that SBSR have a structure that: (a) involves a situation in which there is a dyad engaged in something, (b) is interrupted by an event or person that stresses the child, (c) there is a request for help, (d) the request for help is perceived or help is offered, (e) the help is accepted, (f) the help is effective in resolving the difficulty, (g) the help includes comfort and affect regulation, and (h) finally the dyad returns to the initial state.

In addition, some authors argue that, at the beginning of the preschool stage, where language is not yet fully mastered, these scripts are mainly composed of actions or behaviours that are stored in procedural memory (Main et al. 2005; Schneider, 2011, 2015). Later, with the development of the sense of *self* and autobiographical memory, they evolve into mental representations of attachment which is a guide for interpreting and predicting social interactions along the life (Ainsworth, 1989; Bowlby, 1988; Bretherton, 1991; Waters et al., 2017).

On the other hand, in the preschool stage, the goals regarding the attachment figure shift from focusing on his/her physical proximity and contact, to the need to have her available to recomfort him/her in case of need (Marvin & Britner, 2008). In this sense, maternal sensitivity continues to be an important aspect of the content of these SBSR.

Along these lines, Waters and Roisman (2019) argue that children who receive consistent, sensitive and competent care extract the central features of those experiences to form SBSR that summarise the time-causal sequence of the efficacy of attachment figure support and use.

On the other hand, Waters and Waters (2006) propose that SBSR play a critical role in the child's adjustment throughout his or her life. In that sense, SBSR are also important for the child's SBC. From their formation, they guide the interpretations and expectations in certain attachment-relevant situations. Thus, when the child is interacting with his or her caregiver, he or she compares the characteristics of the situation with his or her SBSR, in order to assess whether it is a situation in which the internalised pattern of behaviour can be applied and thus know how to act in response to it (Bretherton, 1985).

However, some authors (e.g., Posada et al., 2018) add that, while these scripts allow for the activation and use of caregivers as a secure base, SBB also modifies SBSR, thus establishing a bidirectional relationship of interdependence between behavioural (SBB) and representational manifestations of attachment (SBSR). In this regard, some studies have found moderate associations between these two manifestations of attachment (Wong et al., 2011, Ziegenhain & Jacobsen, 1999); however, few studies have yet delved into these processes longitudinally along the preschool stage (Bretherton et al., 1990; Waters et al., 1998; Wong et al., 2011). One study found that increased attachment security at 24 months (expressed in the use of SBB) was positively associated with SBSR at 37 and 54 months (Waters et al., 1998).

As has been argued, the formation of SBSRs is based on the child's repeated experiences of interactions with his or her mother (Ainsworth, 1989; Bowlby, 1988). If in these interactions the mother has been sensitive to her needs and has thereby managed to be a secure base for the child, the child will internalise this interaction as part of her SBSR (Bowlby, 1976; Geenen & Corveleyn, 2013/2014; Marrone, 2001; Posada, Waters et al., 1995; Waters & Cummings, 2000). Thus, maternal sensitivity has been postulated to be associated with mental representations of attachment in general (Schoenmaker et al., 2015; Vaughn et al., 2016) and SBSR in particular (Steele et al., 2014; Waters et al., 2017).

However, the verification of these approaches requires further studies, in particular research assessing the sensitivity and SBB*, as* well as the subsequent manifestations of SBSR.

Therefore, in this study we sought to analyse the relationship between maternal sensitivity, SBB and SBSR in a group of mother-child dyads of low SES preschool children. To this propose, information was collected on the variables of interest at two assessment points: maternal sensitivity and SBB at the first point in time and SBSR at a second point in time, with a one-year gap between the two.

It is hypothesised that maternal sensitivity has a direct relationship with SBSR measured one year later, as well as an indirect relationship through SBB. The assumptions underpinning this hypothesis are (a) maternal sensitivity is directly related to SBSRs, as children who receive sensitive care extract the central features of those experiences to form their representations (Waters & Roisman, 2019); (b) the child develops SBB because of the mother's ability to interpret and respond appropriately to her cues, which will allow her/him to use the mother as a secure base from which to explore the physical and social environment and to return to in times of stress or need (Ainsworth, 1978) and (c) after numerous repetitions, these secure base interactions will become internalised into a kind of mental schema or script that summarises the sequence of actions that make up the SBSR (e.g., Posada et al., 2018), so that the SBB will form the SBSR based on the behavioural experiences of maternal care.

It is important to highlight that, although there is previous research that have studied the variables analysed here, it has mainly focused on detecting relationships between sensitivity and SBB or between SBB and SBSR, separately. In addition, most of them have considered cross-sectional designs or have been carried out at other stages than preschool. In this sense, this research seeks to begin to close this gap and thus complement what is known about the relationship between maternal sensitivity, SBB and mental representations of attachment (Bárrig, 2004; Ugarte, 2014).

Method

Design

The present study used an explanatory research design as it sought to "test models about the relationships between a set of variables as derived from an underlying theory" (Ato et al., 2013, p. 1052). To this aim, the variables were collected at two assessment points with an interval of one year along the children's pre-school years.

Participants

The participant group was composed of 34 mother-child dyads of low SES from a district of Lima, Peru. The sample was selected in an intentional non-probabilistic sampling (Hernández-Sampieri & Mendoza Torres, 2018) given its accessibility.

Participating mothers were contacted through a pre-school center, recommended by a contact in the area, as well as through referrals from other mothers living in the area. Exclusion criteria included the presence of a permanent disability in the mothers or a diagnosis of severe developmental pathology in the children. A specialised questionnaire was used to identify the SES of the dyads.

The children participating in the study were 18 boys and 16 girls. All of them attended an educational institution. At the first assessment time, the children ranged in age from 36 to 59 months (M = 45.26 SD = 7.132) and at the second assessment time from 49 to 73 months (M = 58.09, SD = 7.025). The mean difference in the ages of boys and girls between the first and second assessment time was 12.82 months (SD = 0.99, Min = 11, Max = 15).

The mothers were between 20 and 43 years old (M = 27.76 SD = 5.614) and most of them (41.2%) had two children. 2.9% had incomplete primary education, 38.2% had completed primary education, 50% had completed secondary education and 8.8% had completed higher education (technical or professional). Regarding their occupation, 58.8% had an unpaid job at home, 17.6% had a paid job at home and 23.5% had a paid job outside the home. On the other hand, 85.3% reported that they had the support of someone else for the childcare of their child.

Instruments

Maternal Behavior for Preschoolers Q Set

The Maternal Behavior for Preschoolers Q Set (MBPQS), created by Posada et al. in 1998 (Posada et al., 2007), with the linguistic adaptation of its items carried out by Nóblega (2012), was used to measure maternal sensitivity.

The MBPQS uses the Q-Sort methodology to describe the mother's observed behaviour from 90 items according to their degree of characterisation. Thus, an example item is "consistently responds to the child's cues". The score assigned to the items are correlated with a theoretical score of an ideally sensitive mother (Posada et al., 2007). Thus, each mother's sensitivity score is set in the range of -1 to 1. The closer to 1, the more sensitive behaviour the mother exhibits.

This study is part of a larger investigation in which, in order to assess maternal sensitivity, participating mothers were observed and videotaped during free interaction with their child in two different contexts, first at home and then in a nearby park, for one hour in each. Only the observations obtained in the home were used for this study.

To ensure the reliability of the observations, all videos were scored by two independent observers who were previously trained on the instrument, following the procedure performed in previous studies (Bárrig, 2004; Nóblega et al., 2016, 2019; Posada 2013; Posada et al., 2002, 2004, 2016; Vaughn et al., 2007). The training consisted of at least four training sessions, in the first session, observers were trained in the Q-sort methodology and in the explanation of each of the behaviours contained in the items. Then, observers had to achieve an inter-observer reliability of at least .70 with an expert coder in the coding of three training videos.

In the coding of the videos of the participating mothers, the average inter-observer reliability coefficient was 0.805 (*Min* = 0.603, *Max* = 0.954). In addition, the scores given by both observers to each of the items were discussed in cases where a difference of more than 3 points was obtained until agreement was reached; this procedure was done in order to have a more accurate description of maternal behaviour.

Q-Sort of Attachment

The Attachment Q-Sort version 3.0 (AQS; Waters, 1995), with the linguistic adaptation (Nóblega, 2012) of the Spanish version (Posada et al., 1999), was used to measure SBB. The Attachment Q-Sort is also an observational instrument and presents the same scoring procedure referred for the MBPQS (Posada et al., 1999).

The instrument is composed of 90 items describing the child's behaviour. An example item is "The child clearly shows a pattern of behaviour in which he/she uses the mother as a base from which he/she explores his/her environment: goes away and plays; returns or plays near the mother; goes away again to play, etc.".

The security score is also obtained by correlating the 90 items with a theoretical "ideal attachment" score. This criterion has been validated in different contexts, including Peru (Cadman et al., 2018; Cassibba et al., 2000; Díaz Mosquera & Nóblega, 2020; Nóblega, 2012; Posada, Gao et al., 1995).

Scores for the AQS were obtained from the same videos of free mother-child interaction at home used for the MBPQS assessment. Observers were previously trained until they achieved an adequate level of inter-rater reliability following the procedures described for the MBPQS. As for maternal sensitivity, each observer scored the videos individually, yielding an average inter-observer reliability coefficient of 0.751 (*Min* = 0.421, *Max* = 0.950). In cases where scores differed by more than 3 points, the scores given by both observers were discussed until agreement was reached.

Attachment Story Completion Task

The representational aspect of attachment manifested in the *SBSR* was measured using the Attachment Story Completion Task (ASCT) of Bretherton et al. (1990). For this study, the application procedure proposed by Waters et al. (1998) was used. It consists of three stories, dealing with everyday situations (disobedience, pain and fear) in which the attachment system is activated: (a) The spilled juice (Story 1), (b) The hurt knee (Story 2) and (c) The monster in the room (Story 3). These three stories are presented to the child using dolls representing a family and the child is asked to give an ending to each story.

The rating system proposed by Posada and Waters (2018) was used, in which the three stories are rated according to their similarity to the secure base script, with a score of 3 for the *most similar* and 1 for the *less similar*, intermediate scores (1.5 and 2.5) also considered. The overall score is the average of the scores obtained in the three histories. This instrument has been used in several international studies (Dent & Goodman, 2021; Gullón-Rivera, 2013; Stievenart et al., 2012; Nóblega et al., 2019; Ugarte, 2014).

The responses to the stories were evaluated by two raters. The average inter-rater reliability obtained by the dyads for each of the three stories was 0.88, 0.95 and 0.92, respectively for stories 1, 2 and 3. As in the other two instruments, in the stories where the raters gave scores with a difference of more than 1 point, both raters discussed the scores until agreement was reached. Finally, the scores given to the three stories show significant and direct relationships with each other, which ranged from 0.210 to 0.488 (Table 1).

Sociodemographic Questionnaire

In the larger research that includes this study, mothers answer a questionnaire to collect information about the participating child, herself and the household context. The same questionnaire was administered at both the first and second evaluation time points, with the exception of questions whose responses remained stable over time (e.g. mother's level of education). For this study, only the variables theoretically relevant to the stated objectives were considered. Thus, child´s age and gender was considered. For the mother, information about age, educational level, number of children, employment status and perception of support in parenting was considered. In addition, 15 questions were included to identify the SES of the family.

Procedure

This study used data collected as part of a larger longitudinal study that was approved by the Research Ethics Committee of the Pontificia Universidad Católica del Perú.

Before agreeing to participate in the study, all mothers were informed about the steps that would be carried out as part of the research, the risks and benefits, the voluntary nature of the study, as well as the confidentiality of the data. In addition, if they agreed to participate, they were asked to sign an informed consent form explaining these points, which was read together with all participating mothers. At the end of the first evaluation visits, each mother was given a voucher equivalent to 7 dollars, and at the end of the second evaluation visit, they were given a voucher for the same amount plus a toy for the child.

Two visits to the dyads at both evaluation times were made. During the first visit, the informed consent form was reviewed and signed, the ASCT was administered and the free interaction at home was recorded. The ASCT was administered by a trained personal in a distraction-free space in the home. In order to avoid interference, another personal conducted another activity with the mother at the same time. For the recording of the free interaction at home, the mother was instructed to act with her child as she did daily. During the second visit, socio-demographic data were collected from the mother's report and the free interaction was recorded in a nearby park (these data are not part of this study).

Data Analysis

Statistical analyses were performed using the SPSS version 25.0 statistical package and the IBM SPSS AMOS structural equation modelling program 26.

First, preliminary univariate analyses were carried out. The absence of missing data for the study variables and socio-demographic data was checked. In addition, the normality of frequencies distribution of the study variables was assessed through the analysis of skewness and kurtosis, the absolute values of 3 and 10 were used as cut-off points to consider a deviation from symmetry or kurtosis respectively in the sample (Kline, 2015). Descriptive statistics of mean, standard deviation, minimum and maximum were then obtained for the study variables. Then, Pearson's bivariate linear correlations were calculated between the study variables, as well as between these and the sociodemographic variables.

In the same way, preliminary multivariate analyses were calculated. Thus, the collinearity of the study variables was explored using tolerance indices and variance inflation factors. Additionally, the presence of multivariate outliers was assessed through the Mahalanobis distance, a *p-value of* less than 0.001 was considered to define a multivariate outlier (Kline, 2015). Finally, multivariate kurtosis was calculated which had to be greater than 5 to consider a significant deviation of the multivariate data (Byrne, 2010).

The main analyses were then performed, assessing the fit of the statistical model representing the hypothesised relationship between maternal sensitivity, SBB and the child's SBSR, while including in the model the socio-demographic variables of the mother that had a significant correlation with the study variables.

For this purpose, a path analysis was performed using the maximum likelihood method. To assess the model fit, several indices were used (Byrne, 2010; Hooper et al., 2008): χ^2, χ^2/gl, the Jöreskog goodness-of-fit

index (GFI), the Bentler-Bonett comparative index (CFI), the root mean squared error of approximation (RMSEA) and the root mean squared standardised residual (SRMR). The model was considered acceptable if it had a non-significant χ^2 value and $\chi^2/gl \leq 2$ due to the dependence of the former on the sample size, GFI and CFI > 0.90, RMSEA ≤ 0.06 (Bentler, 1990; Hu & Bentler, 1999; Kline, 2015) and SRMR ≤ 0.05 (Hooper et al., 2008).

Finally, the post hoc sample size required to obtain a medium effect size and adequate statistical power was determined. Free Statistics Calculators was used for this purpose. The appropriate sample size for this research was 200 dyads, taking into account that there are six observed variables and one latent variable. However, given the complexity of the application (observations of each dyad for one hour, children's narratives recorded, transcribed and coded individually in two evaluation moments one year apart) and the limited resources of the study, it was decided to continue with the analyses despite being a very small sample with little statistical power; in this sense, the results obtained are considered to be exploratory.

Results

Preliminary Univariate and Multivariate Analyses

On the univariate normality of the variables of interest, we found no skewness (values were between -0.181 and 1.074) and no kurtosis (values were between -1.306 and 1.203). Regarding descriptive statistics, Table 1 shows that the mothers' sensitivity score at the first moment obtained a mean of 0.011 (*SD* = 0.41, *Min* = -0.68, *Max* = 0.74), while the mean SBB score of the observed children was 0.105 (*SD* = 0.198, *Min* = -0.319, *Max* = 0.471). On the other hand, the mean scores of the ASCT stories at the global level, assessed at the second time point, were 1.88 (*SD* = 0.44, *Min* = 1, *Max* = 2.70), while the corresponding scores for stories 1, 2 and 3 obtained scores of 2.03 (*SD* = 0.60, *Min* = 1, *Max* = 3), 1.65 (*SD* = 0.55, *Min* = 1, *Max* = 2.75) and 1.90 (*SD* = 0.60, *Min* = 1, *Max* = 3), respectively. As can be seen, there is a high dispersion of the data in particular for maternal sensitivity, although as described above, the frequency distribution of the data follows the shape of a normal distribution.

Table 1 also shows the results of the correlation analysis between the study variables and the socio-demographic data, with which statistically significant correlations were obtained. Thus, the SBB assessed at the first moment has a significant and direct relationship with maternal sensitivity and this is related to the SBSR. At the same time, SBB and maternal sensitivity correlate inversely and significantly with maternal age and the number of sons and daughters. On the other hand, both maternal sensitivity and SBB are significantly related to the global SBSR scores and to the scores of stories 2 and 3 but not to story 1.

Table 1

Correlations, Means and Standard Deviations of the Main Study Variables and Sociodemographic Data with Significant Correlations

	2	3	4	5	6	7	8	*M*	*DE*
1. SBB time 1	0,492**	-0,523**	-0,404*	0,463**	0,147	0,588**	0,336*	0,105	0,198
2. Maternal sensitivity time 1	1	-0,419*	-0,395*	0,426*	0,044	0,566**	0,353*	0,011	0,409
3. Mother's age time 1	-	1	0,511*	-0,211	0,225	-0,491**	-0,244	27,760	5,614
4. Number of mother's children time 1	-	-	1	-0,186	0,131	-0,361*	-0,199	1,970	0,969
5. SBSR Global time 2	-	-	-	1	0,705**	0,799**	0,759**	1,876	0,442
6. SBSR History 1 time 2	-	-	-	-	1	0,373*	0,210	2,029	0,605
7. SBSR History 2 time 2	-	-	-	-	-	1	0,488**	1,647	0,551
8. SBSR History 3 time 2	-	-	-	-	-	-	1	1,904	0,603

Note. SBB = secure base behaviour; SBSR = secure base script representations. * $p < 0.05$; ** $p < 0.01$.

With reference to the preliminary multivariate analyses, the assessment of collinearity showed that the tolerance indices were between 0.475 and 0.751 while the variance inflation factors were between 1.332 and 2.105. The collinearity diagnosis showed that only one of the condition indices is greater than the value of 15 and that in most cases, each dimension predominantly explains the variance of only one coefficient, except for one case which is explained by two dimensions. Indeed, a certain collinearity of the variables is noted, which will be considered in the interpretation of the results obtained.

Regarding multivariate normality, no outliers were found (Mahalanobis distances were between 1.204 and 17.829, $M = 5.824$, $SD = 3.552$ and all associated *p-values* above 0.001). It was also observed that the data do not deviate substantially from multivariate normality as the multivariate kurtosis obtained a value of 3.738.

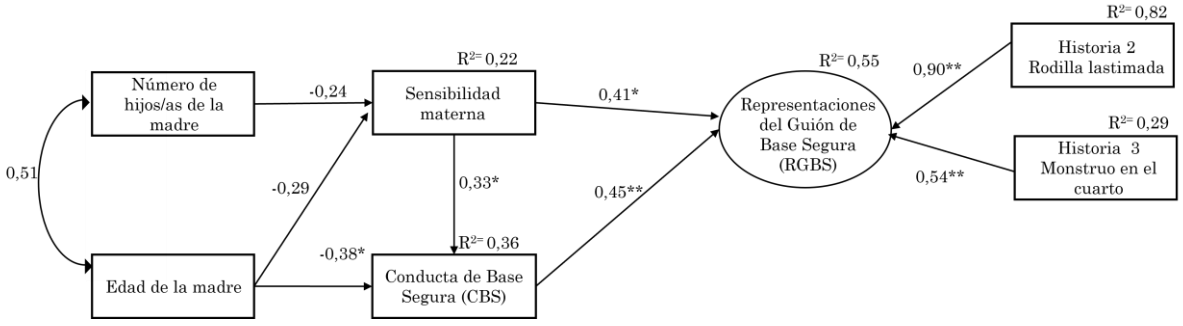
Model Fitting Results

In order to test the relationship between maternal sensitivity, SBB and the child's SBSR; in the statistical model maternal sensitivity and SBB were introduced as independent variables in addition to the socio-demographic variables with a significant association: age and number of children of the mother. In addition, the child's SBSR was included as a latent variable, composed of the observable variables from the scores of stories 2 and 3 (Hurt Knee and Monster in the room, respectively). Scores from story 1 (Spilled juice) were not included, as it did not show significant correlations with any of the variables of interest (Table 1).

The model in Figure 1 positing the hypothesised relationships between maternal sensitivity, SBB and child SBSR, showed acceptable fit values to the data according to the criteria of Byrne (2010) and Hooper et al. (2008): χ^2 (6, $n = 35$) = 1.86, $p = 0.932$, χ^2 /gl = 0.311, CFI = 1.000, GFI = 0.982, RMSEA = 0.000 [0.00, 0.06] and SRMR = 0.038.

Figure 1

Path Analysis for the Structural Equation Model Postulating the Relationship between Maternal Sensitivity, SBB and SBSR



Note. The graph shows the standardised regression coefficients and their significance level (*$p < 0.05$; **$p < 0.01$) as well as the explained variance (R^2) of each study variable.

As can be seen in Figure 1, maternal sensitivity, measured at time one, has a direct and significant relationship with the child's SBSR assessed at time two, i.e. one year later, ($r = 0.41$; $p = 0.05$). In addition, maternal sensitivity has an indirect effect on the SBSR through the SBB that was also measured at time one, although of lesser magnitude ($r = 0.15$; $p = 0.03$). On the other hand, the model evaluated shows that maternal sensitivity and the child's SBB, both measured at the first time point, explain 55% of the variance of the SBSR measured one year later.

Discussion

The main objective of this research was to analyse the relationship between maternal sensitivity and SBB measured at a first evaluation moment with SBSR measured at a second moment, one year later, in 34 mother-child dyads of low SES in a district of Lima, Peru.

In relation to preliminary analyses, firstly, we found that the sensitivity of the participating mothers was lower than that reported in other studies conducted with Latino samples (e.g., Posada et al., 1999, 2016; Díaz Mosquera & Nóblega, 2020) and it is in the lower range of that found in studies with Peruvian samples (Muñoz-Nájar Cornejo, 2020; Nóblega, et al., 2019; Nóblega et al., 2016; Pereyra, 2016). This could be explained by the fact that the participating mothers were of lower SES than in previous studies. In this sense, following the family stress model (Conger & Elder, 1994), it is possible that economic pressures affect the functioning of low-SES family dynamics, facilitating the existence of higher levels of stress, which, in turn, would make it difficult for these mothers to be sensitive to the needs of their children (Guryan et al., 2008; Kalil et al., 2012; Sayer et al., 2004). Likewise, as suggested by authors such as Sturge-Apple et al. (2016), the characteristics of low SES contexts could be affecting the availability of cognitive resources, at the level of inhibitory control and working memory, limiting the ability of these mothers to capture, interpret and respond appropriately to their children's signals. However, further analysis of these results would need to be carried out in subsequent studies to gain a better understanding of the mechanisms underlying this relationship, especially considering the scarcity of literature in low socio-economic sectors and particularly in Latin American contexts.

On the other hand, it was found that mothers' sensitivity would be inversely related to their age, which does not coincide with previously reported findings (e.g., Posada et al., 2016; Santelices et al., 2015). This could be related to the fact that, in a context such as that of these mothers, where resources are scarce, an older mother's age would mean more time exposed to unmet basic needs, greater stress and, therefore, less sensitivity (Magnuson & Duncan, 2019). At the same time, an inverse association was identified between mothers' sensitivity and the number of children, which would make some sense of the previous finding. In this regard, one explanation could be that having a greater number of children would imply that mothers have less time for each of them, which would manifest itself in a lower sensitivity to their needs (Magnuson & Duncan, 2019).

In reference to the SBB, the participating children, on average, obtained lower attachment security indices than other groups of Latin American and Peruvian preschool children (Nóblega et al., 2019; Posada et al., 2016). One explanation could be that these children have not been able to establish a secure attachment with their mothers, due to their low sensitivity, which - as mentioned - could be linked to the stressors associated with the low SES of the families. However, further studies are needed to better understand these results.

Additionally, this study assessed the relationship between maternal sensitivity and SBSR assessed 12 months later. Specifically, it was found that the child's maternal sensitivity at one point in time is significantly and directly linked to the SBSR that the child develops one year later, measured during the child's preschool period between 3 and 6 years of age. The results obtained in this study are in line with previous studies that have analysed this relationship over longer periods of time, ranging from infancy to adolescence and early adulthood (Posada et al., 2018; Schoenmaker et al., 2006; Steele et al., 2014; Vaughn et al., 2016; Waters et al., 2017). Furthermore, they corroborate what has been proposed by other authors on the important role of quality of care and maternal behaviours during early stages, especially the first three years of life, in the formation of SBSR in later stages (Waters & Roisman, 2019).

The main aim of this study was to explore the role of SBB in the predictive relationship between maternal sensitivity and SBSR, with a time span of one year between the measurement of both. Thus, it was proposed that, on the one hand, maternal sensitivity is directly related to SBSR and to the child's SBB, while, on the other hand, SBB also has a relationship with SBSR. Thus, when assessed at two different points in time, there would be a direct relationship between sensitivity and SBSR and an indirect relationship between sensitivity and SBSR through SBB. This hypothesis is also supported by the fact that, although the behaviour of the caregivers is an important element in the formation of the SBSR, it would be the sequences of actions and emotions of the child him/herself, which form part of the SBB, that are stored in the procedural memory, the substrate of the SBSR.

The results found in this study corroborate this hypothesis. This finding is consistent with that reported by Wong et al. (2011) in a longitudinal study of preschoolers in Portugal and the United States, in which SBB predicted SBSR one and a half years later, as well as with other studies that found relationships between caregiver sensitivity in preschool and SBSR during adolescence and adulthood (Schoenmaker et al., 2015; Steele et al., 2014). However, the results contrast with the findings of the latter studies, which found no significant associations between SBB in early stages (infancy and preschool) and SBSR in adolescence and adulthood. This could be due to the fact that in this study the measurement of the three variables was made during the pre-school period, in which the attachment still has strong behavioural manifestations and an entry into representational elements is experienced, while in later stages, such as adolescence and adulthood, the SBSR become more complex and contain autobiographical and other more abstract or symbolic elements of experience. In this sense, it would be expected that, as the evaluation of both aspects is within the same stage, in which the main domain is still behavioural, it is more likely that this relationship is still maintained. This explanation is in line with the revisionist developmental perspective, which posits that new factors emerge over time that weaken the impact of some early experiences on later developmental outcomes (Fraley et al., 2013; Roisman & Fraley, 2013).

Conclusions

The results obtained in this study constitute a contribution to the body of research that has attempted to search for predictive relationships between the experiences of sensitive care and the formation of behavioural and representational aspects of the attachment. Moreover, it has the additional value of being a longitudinal study, which is a very useful design for analysing this type of relationship that has so far been little used in the Latin American context. However, these initial contributions need to be corroborated in subsequent studies, incorporating a greater number of measurements at different time intervals that can better reflect the evolution of the children's experience and the constant feedback between SBB and SBSR. These studies would allow for evidence of continuities and discontinuities in this important interaction between the components of the attachment, which would close the current evolutionary gap in this relationship up to the stages of adolescence and adulthood where previous studies have been conducted.

Notably, the direct predictive relationship between maternal sensitivity and SBSR was stronger than the relationship established through SBB. This finding would indicate that maternal interactive behaviour in the early preschool years may shape more strongly the characteristics of the child's SBSR one year later, compared to the influence of SBB on SBSR. However, it is important to consider that the greater effect of the direct relationship may be due to the presence of some collinearity between the variables such that the relationship between maternal sensitivity and SBB may be decreasing the predictive capacity of SBB on SBSR.

At the same time, another interesting result is that both aspects of the attachment with the mother - maternal behaviour and the child's behaviour in the context of mutual interaction - explain a good percentage of the variability found in the SBSR. These results are novel and have no previous reference in the literature, so it is necessary to continue promoting similar studies that make it possible to demonstrate the similarities and differences of these relationships within this context and compared to others.

Despite the contribution made by this study, it is important to mention its limitations. Firstly, although it was possible to test a model with structural equation analysis having verified some univariate and multivariate normality of the data distribution and obtaining acceptable fit indices and significant factor loadings, it is likely that the small sample size did not allow us to appreciate some relevant relationships to include in the model or increased the weight of the factors included. The small sample size and the associated high coefficients of variation of the variables gave the study a low statistical power so that the results are very sensitive to small variations in the data. Therefore, the results obtained in this study should be considered as preliminary and it is recommended to continue replicating the study with larger and more representative samples to recreate the variety of attachment experiences of children and their mothers, both from low socio-economic contexts and from other socio-economic contexts, be they Latin American or from other parts of the world.

On the other hand, an important limitation of this study is the consideration of the SBB that the child establishes with his or her mother, leaving aside the contribution made by other caregivers, such as the father, other relatives and caregivers, especially in the preschool stage, and even more so in a Latin American context characterised by the presence of multiple caregivers (Fourment et al., 2021). Studies that include

diverse attachment figures and their role in SBSR constitute a pending agenda that would help to better understand the nature of the mental representations of attachment that are influenced by multiple social relationships that the preschool child establish in these contexts.

Finally, it is important to highlight one aspect of the functioning of the ASCT that was used as an instrument to collect information about the SBSR. As described above, in the analysis of the model, the first of the three stories was excluded. It, firstly, could affect comparability with other studies using the three stories proposed by the instrument. Secondly, the exclusion of this story responded to the preliminary statistical analyses carried out, in which the scores obtained in story 1 were not significantly related to either the child's SBB or his or her mother's sensitivity measured one year earlier, a prerequisite for inclusion in the model. This lack of relationship could be due to the content of the story: "Spilled juice" is a situation that, although it triggers an attachment behaviour like the other two stories, this one seems to have a different nuance, as it focuses on a situation in which the child may not have been careful enough when handling the glass, in which the attachment figure could adopt a corrective or punitive role rather than being a source of calm and protection. In contrast, in the other two stories, the situation evoking attachment behaviour is harm or pain (Hurt Knee) or fear (Monster in the room), to which the attachment figure's response would more clearly be to provide a safe haven for the child. These differences may be more noticeable in Latin American contexts, where obedience and following maternal directions is valued as part of socialisation (Dixon et al., 2008).

It is interesting to consider that, despite this psychometric performance of the first story, the global ASCT scores including the scores of this story were indeed associated with SBB and maternal sensitivity; indeed, the scores of the first story were significantly associated with those of the other two stories. These results bring into debate the decision whether to consider only global or partial scores, a decision that is especially important for cases in which the input of exogenous variables is required, such as in a structural equation analysis. In this study we chose to eliminate this history, which may have disadvantages.

In conclusion, it should be noted that this study, which contributes to the discussion of the central concepts of attachment theory, is pioneering in the Latin American and Peruvian context, and therefore seeks to open up a field for a series of similar studies that will continue to contribute to a better understanding of the theoretical aspects postulated by this important theory of human relations.

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