

# EFFECTS OF AN INTERVENTION TO PROMOTE SOCIOEMOTIONAL DEVELOPMENT IN TERMS OF ATTACHMENT SECURITY: A STUDY IN EARLY INSTITUTIONALIZATION IN CHILE

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**ABSTRACT:** The Chilean government commissioned a quasi-experimental study with a pre-/postintervention design that had two general aims: (a) to assess infants' psychoaffective developmental levels (pre-intervention phase) and (b) to evaluate whether an intervention based on the promotion of socioemotional development modifies the infant's psychoaffective development. Sixty-two institutionalized infants and their alternative caregivers were evaluated at a pre-intervention stage. An intervention then took place, with the caregivers trained according to an "attachment sensitivity manual." Results showed normal ranges of psychomotor development (64% normal, 9% delayed) and a very high frequency of attachment insecurity, as compared to the normative population (53%). The intervention significantly improved social orientation and object orientation as well as activity and reactivity levels. We conclude that although institutionalized infants in Chile do not exhibit high levels of atypical attachment, socioemotional deterioration may lead to vulnerability in present and future development. Finally, the scope of this study affected public policies regarding children, initiating a change to a foster family system and a variety of modifications in the strategies for adopting institutionalized infants.

**RESUMEN:** Como en el resto del mundo, la institucionalización a una edad temprana es un problema en Chile en el que se debe actuar. El gobierno chileno ordenó un estudio cuasi-experimental con un diseño de pre- y post- intervención. Esta investigación tiene dos metas generales: 1) evaluar los niveles de desarrollo sico-afectivos de los bebés (fase de pre-intervención) y 2) evaluar si una intervención basada en la promoción de un desarrollo socio-emocional modifica el desarrollo sico-afectivo del bebé. Sesenta y dos bebés institucionalizados y quienes alternativamente les cuidaban fueron evaluados al nivel de pre-intervención. Luego se llevó a cabo una intervención con los cuidadores bajo la modalidad de un "manual de sensibilidad en la afectividad." Los resultados muestran parámetros normales del desarrollo sicomotor (64% normal y 9% retrasado) y una muy alta frecuencia de inseguridad en la afectividad, en comparación con la población normativa (53%). La intervención significativamente mejoró la orientación social, la orientación de objeto, así como los niveles de actividad y reactividad. El estudio concluye que aunque los bebés institucionalizados en Chile no presentan altos niveles de afectividad atípica, el deterioro socio-emocional pudiera llevar a la vulnerabilidad en el desarrollo presente y futuro. Finalmente, el alcance de este estudio afectó la política pública sobre los niños, lo cual dio inicio al sistema de familias u hogares sustitutos y a una variedad de modificaciones en las estrategias para adoptar a infantes institucionalizados.

**RÉSUMÉ:** Comme dans le reste du monde l'institutionnalisation précoce en orphelinat est un problème auquel le Chili doit faire face. Le gouvernement chilien a demandé une étude quasi expérimentale avec un modèle de pré- et post-intervention. Cette étude avait deux buts principaux: 1) évaluer les niveaux de développement psycho-effectif des bébés (phases pré intervention) et 2) évaluer si une intervention basée sur la promotion d'un développement socio-émotionnel modifie le développement psycho-affectif du bébé. 62 bébés institutionnalisés et leurs modes de soin de remplacement ont été évalués à un stade de pré-intervention. Ensuite une intervention a eu lieu avec les modes de soin sous la modalité un "Manuel de sensibilité à l'attachement". Les résultats ont montré des éventails normaux de développement psychomoteur (64% normal et 9% en retard) ainsi qu'une fréquence très élevée d'insécurité de l'attachement, comparé à la population normative (53%). L'intervention a amélioré de façon importante l'orientation sociale, l'orientation de l'objet, ainsi que les niveaux d'activité et de réactivité. L'étude conclut que bien que les bébés en orphelinat au Chili ne font pas preuve de niveaux élevé d'attachement atypique, la détérioration socio-émotionnelle peut mener à une vulnérabilité dans le développement présent et futur. Enfin, l'étendue de cette étude a affecté les politiques publiques pour ce qui concerne les enfants, déclenchant un changement vers un système de placement en famille et une variété de modifications dans les stratégies d'adoption des nourrissons d'enfants placés en orphelinat.

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**ZUSAMMENFASSUNG:** Wie überall in der Welt, ist in Chile eine frühzeitige Institutionalisierung ein Problem, dem entgegengewirkt werden muss. Die chilenische Regierung gab eine quasi-experimentelle Studie mit einem Pre-Post-Interventions-Design in Auftrag. Diese Untersuchung hatte zwei allgemeine Ziele: 1) die psycho-affektiven Entwicklungsstufen der Säuglinge (Pre-Interventionsphase) zu bewerten und 2) zu beurteilen, ob eine Intervention auf der Grundlage der sozio-emotionalen Entwicklungsförderung der Säuglinge die psycho-affektive Entwicklung verändert. 62 institutionalisierte Säuglinge und ihre Pflegepersonen wurden vor der Intervention beurteilt. Dann erfolgte eine Intervention mit den Pflegepersonen anhand eines „Bindungs-Sensitivitäts-Manuals“. Die Ergebnisse zeigten normale Werte für die psychomotorische Entwicklung (64% normal und 9% verzögert) und eine sehr häufige Bindungsunsicherheit gegenüber der Normalbevölkerung (53%). Die Intervention verbesserte deutlich die soziale Orientierung, Objektorientierung sowie Aktivität und Reaktivität. Die Studie schlussfolgert dass, obwohl die institutionalisierten Säuglinge in Chile keine hohe atypische Bindung zeigen, der sozio-emotionale Verfall zu Vulnerabilität in der gegenwärtigen und zukünftigen Entwicklung führen kann. Schließlich beeinflusste der Geltungsbereich dieser Studie die öffentliche Politik in Bezug auf Kinder, indem eine Änderung des Pflegefamilien-Systems und eine Vielzahl von Veränderungen in den Strategien für die Adoption institutionalisierter Kinder eingeleitet wurden.

**ABSTRACT:** As in the rest of the world, early institutionalization is a problem in Chile that must be addressed.

抄録:世界のその他の国々と同様に、早期の施設入所が、チリにおいても取り組むべき問題である。チリ政府は、介入前-後という研究デザインの準実験を委託した。この調査には二つの全般的な目的があった。1)(介入前)赤ちゃんの心理-感情的な発達水準を評価する、および2)社会-情緒的発達の促進に基づいた介入が、赤ちゃんの心理-感情的な発達を修正したかどうかを評価する。62人の施設に入った赤ちゃんとその代替養育者が、介入前の段階で評価された。それから「愛着感受性マニュアル」の様式の下に、養育者に介入が実施された。結果から、標準人口に比べて、正常範囲の精神運動発達(64% 正常および9% 遅滞)と、非常に高い頻度の不安定な愛着(53%)が示された。介入は、活動性と反応性の水準だけでなく、社会的な指向、物への指向を有意に改善した。研究から、チリの施設に入所した赤ちゃんは高水準の非定型的な愛着を示さなかったとはいえ、社会-感情的な荒廃は、現在と将来の発達における脆弱性につながるだろうと結論付けた。最後に、この研究の範囲は子どもに関する公共政策に影響し、里親家族システムに変化をもたらし、そして施設入所乳児の養子への戦略にさまざまな修正をもたらした。

\* \* \*

The National Services of Minors (Servicio Nacional de Menores/SENAME) is a Chilean government agency created in 1979 whose mission is the restitution of the rights of children who have suffered multiple vulnerabilities by implementing a network of child-protection programs. At the beginning, this institution undertook a series of programs organized in a residential system for children birth to 18 years of age whose rights had been seriously violated.

At that time, the main strategy for alternative care of at-risk children consisted of placement in orphanage-type centers where a large number of infants were in the care of a small number of adults. Until 1990, this system of institutionalization constituted 62% of the total provision of all SENAME programs.

In 1991, Chile endorsed the Convention on the Rights of the Child (1999), promoting a more demanding institutional context to assess the public policies of the time regarding the alternative care of children. Unfortunately, movement from the proposal of the Convention to the execution of concrete and effective changes for the promotion of children's integral well-being was exceedingly slow, mainly due to a lack of awareness regarding children's rights and needs (SENAME, 2011). For 15 years, institutionalization continued to be a mainstay of SENAME programs. Approximately 8 years ago, a review was done of the international studies that analyzed the adverse effects of early institutionalization on children. This caused concern at the governmental level regarding institutionalized children and their situation, and led to SENAME being

commissioned to formulate and conduct a study to examine the issue. The Center of Developmental Studies and Childhood Intervention of the Universidad del Desarrollo was selected to conduct the study.

Until this study was commissioned, there were no quantitative data in Chile that reflected the reality of institutionalized children, especially during their first year of life. For this reason, SENAME requested a quasi-experimental study with a pre-/postintervention design, with evaluation and intervention in early institutionalization as its goals. Attachment was a focus of the intervention and evaluation. Various studies have endorsed this decision because it is a common observation that children with different levels of attachment respond differently to different types of interventions (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003, 2005; Berlin, 2005; Berlin, Zeanah, & Lieberman, 2008; Dozier et al., 2006; Lecannelier, in press).

The aims of the study were to: (a) evaluate the psychoaffective state of infants in institutional conditions in the areas of attachment, psychomotor development, temperament, and social development; and (b) analyze the effectiveness of a program to promote socioemotional development implemented in the residential centers, considering attachment security as an organizing variable. The ultimate purpose was to bring about changes in public policies on the importance of childhood deinstitutionalization. This was the first study conducted in Chile that demonstrated both the infants' vulnerability and the importance of applying early intervention programs.

## METHOD

### *Description of the Child-Protection Centers*

The structure and organization of the child-protection centers vary widely. Specifically, SENAME public centers have a child-caregiver ratio that varies from 6 to 20 children per caregiver; the shifts can be highly variable, but generally there is a high caregiver turnover; the basic physical conditions are adequate, but many of these centers do not have adequate space for play, exploration, and peer interaction; the caregivers have very low (or nonexistent) levels of training and no specialized professional education; and the daily life of the infants is a highly structured routine with little space for personal attention. A private center (San José Foundation) is located in Santiago, the capital of Chile, in a high-income district; it has a ratio of 4 to 8 children per caregiver; low staff turnover; physical conditions better adapted to play, exploration, and activity; a low level of training and preparation for the care of the children and structured routines; and some space for personal attention.

### *Participants*

The study population consisted of institutionalized infants from 2 to 12 months of age in 2005 to 2006. The sample was obtained from SENAME-dependent, state-run centers and the private center San José Foundation for Christian Adoption. These centers represent 95% of the residences that take in minors during the first years of life. The information was obtained through analysis of the infants' files and records provided by the institutions. The infants were evaluated in several cities around the country (Santiago, Talca, Osorno, Temuco, Concepción, La Serena, Curicó, and Rengo). Exclusion criteria were related to the presence of an organic pathology or other disorder that would render impossible the suitable administration of the assessment instruments. The total number of infants assessed in the preprocessing phase was 62 (6 from the private center). Due to sample dropout, the total number in the postintervention phase was 41 (6 from the private center). The reasons for this loss were that infants were adopted between the pre- and postevaluations and the difficulty of kin to convince some centers to allow the children to be evaluated. Ultimately, 34 male infants and 28 female infants were studied, whose total average age at the pre-intervention assessment was 152.08 days ( $SD = 41.89$ ). On average, the age of institutionalization was 25.75 days ( $SD = 43.22$ ), and the average Apgar score of the infants was 8.62 ( $SD = 1.6$ ). In terms of the type of delivery, 39 children were normal births, and 23 were by caesarian section.

### *Description of the Intervention*

The intervention included a "parental sensitivity manual," which consists of the development and promotion of skills, knowledge, and attitudes adequate to understanding, managing, and assessing the infant's competencies and development. Caregiver training in the centers for early institutionalization was performed

by the research team in a face-to-face format. A meta-analysis showed that this type of intervention is effective at increasing attachment quality and socioaffective development (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003, 2005). The manual used in this study was created by Lecannelier et al. and published by SENAME (Lecannelier, Hoffmann, Casas, & Flores, 2007; Lecannelier, 2006). The manual was designed so that the caregivers could apply it during the infant's daily routines and activities (washing, changing, feeding, going to bed, playing, etc.) due to the lack of extra time to dedicate to the infants. The manual is divided into two sets of knowledge, competencies and attitudes: basic and specific. The basic aspects involve the minimum competencies for interacting with the infants and include the promotion of physical contact (massage), visual contact, and vocalization. The specific aspects include a more complex type of activity related to the promotion of interactive play, the detection and regulation of temperament, and the detection and regulation of attachment styles. Caregivers were trained on the manual for 1 day, and there was permanent supervision throughout the process. Each of these elements includes one section of knowledge to acquire and another set of competencies to develop.

The manual was applied as follows: (a) Caregivers were contacted, and the aim of the intervention was explained to them; (b) practical training was given to the caregivers based on the intervention manual (4 hr in duration); (c) the process of the intervention by the caregivers lasted 2 months; (d) the manual application was assessed via the Intervention Record Sheet that included closed and open questions on the learning and intervention sections of the manual. In addition, weekly supervision was undertaken by the research team through online conversations, e-mail, telephone calls, and face-to-face meetings. (e) The intervention ended with a closing session, during which caregivers were motivated to continue using the manual.

### *Instruments*

*Guideline for identification of the infant.* A general information guideline was created that included data regarding name, age, sex, date of birth, date of arrival at the center, prenatal history (open response), type of childbirth (normal, caesarean, premature, delayed, with forceps, and birth asphyxia), perinatal history, general medical history, and general problems (colic, sleeping issues, feeding, and excessive crying).

*Massie-Campbell's Attachment During Stress scale (ADS).* This instrument is a modified version and adaptation of an observation guideline of indicators of the quality of attachment, observed in both the principal caregiver and the infant (Massie & Campbell, 1978). The observation guidelines includes seven behavioral indicators of attachment (gazing, vocalizing, touching A, touching B, holding, affect and proximity) which are organized on a scale of 1 to 5, where each score reflects a specific description of the type of behavior to use (e.g., a score of 1 for the indicator "gazing" of the mother represents "always looks away from

the baby's face"). Scores near 1 to 2 indicate an avoidant insecure attachment (The term *indicators* is used because before 12 months, it is not possible to assign a clear classification of the type of attachment because this is part of a developmental process.), and the scores near 5 indicate a resistant insecure attachment. The scores near 3 to 4 indicate a secure attachment. Nevertheless, due to the age of the infants (0–12 months), only the general categories of "security" versus "insecurity" were considered in this study.

Adequate levels of convergent validity have been reported regarding the content and construct of the instrument (Cárcamo, van IJzendoorn, Vermeer, & van der Deer, 2013). This guideline is currently used as a standard measurement to assess attachment (when the infants are aged 4 and 12 months) in a National Childhood Protection Program called "Chile Crece Contigo" ("Chile Grows With You") (Lecannelier, Hoffmann, & Frinco, 2008; Lecannelier & Zamora, 2013) as well as in various studies on high-risk populations (Pereira, 2010) and effectiveness studies of early intervention models (Lecannelier et al., 2009). The infants' level of security was assessed with "significant" caregivers, although in many cases it was not possible to make this distinction (In those cases, a caregiver was chosen at random.) The interactions were recorded on videotape and coded by three teams of two experts each with more than 5 years of experience in the use of the scale and the observation of attachment. Disagreements were discussed within the team; the agreement level was very good ( $\kappa = .84$ ). Finally, coders were blinded to the type of center where the child was located and his or her history, but could not be blinded to the aim of the study (since when observing the videos it was obvious that the infants were institutionalized).

*Psychomotor development assessment scale from 0 to 24 months.* The psychomotor developmental scale for 0–24 months (EEDP; Rodriguez, Arancibia, & Undurraga, 1978) is the main instrument used in Chile to assess psychomotor development in the areas of motor skills, language, social skills, and coordination). The child receives a score for his or her development that can fall into one of three categories: Normal, At Risk, or Delayed. All the evaluations were recorded on videotape to allow free and comprehensive coding.

*Infant behavior record (IBR; Stifter & Corey, 2001).* The IBR, created at the University of Pennsylvania, includes a series of observation criteria (11 items) applied to the infant's daily behavior over a period of time and scored from 1 (Behavior towards persons is not different from behavior towards objects) to 9 (Behavior seems to be continuously affected by awareness of persons present) or from 1 (Stays quietly in one place, with practically no self-initiated movement) to 5 (Moderate activity; enters into games with freedom of action), and the total score is compared to national standards. The IBR requires the presence of two observers who must analyze the infant's behavior for 90 min and later code the 11 items together. Finally, the instrument sheds light on four factors: social approxi-

mation (which includes responsiveness to the examiner, low level of fear, general emotional tone, resilience, and low irritability); task orientation 1 (Does not look at or in any way indicate interest in objects) to 9 (Reluctantly relinquishes objects/test materials), (attention to objects and fixing attention); activity (degree of body movement), and reactivity 1 (Unreactive; seems to pay little heed to what goes on around him; responds only to strong or repeated stimulation) to 9 (Very reactive; every little thing seems to stir him up; he startles, reacts quickly, seems keenly sensitive to things going on around him), (infant's sensitivity to stimuli).

## Design

This was a quasi-experimental study with a pre-intervention assessment, an intervention, and a postintervention assessment.

## Procedure

The basic procedure was implemented through a series of stages of contact and coordination with the institutions and centers involved in the study. Once the initial contact had been made with each center, an assessment team made the first visit to the center to analyze the conditions of physical and human resources for the applicability of the instruments and to establish the first contact and collaboration with the caregivers at the center. In addition, a list of infants to be assessed according to the inclusion and exclusion criteria was made in conjunction with the caregivers. In a second visit, the assessment team administered the appropriate measures, including the ADS, the EEDP, and the IBR. Each assessor was trained in the instruments according to an "administration and coding manual" created by the research team. Finally, all assessment sessions were recorded on videotape for their subsequent coding and scoring by a group not associated with those who performed the assessments. Once the pretreatment evaluation ended, the intervention was administered, which consisted of training the caregivers and the delivery of a manual that contained the topics and activities to be executed (4 hr). In addition, an "Intervention Record Sheet" was given to the caregivers, which had to be completed at the end of every week and which collected information on the level of motivation, understanding, and applicability of the manual. This record was created for monitoring the program implementation and not for research purposes. Finally, the trainers carried out weekly supervision through meetings in person, e-mail, or telephone calls to receive questions and comments. The intervention stage lasted 2 months. Finally, the assessment team made a third visit to the centers to apply the instruments of the postintervention phase.

## RESULTS

### *Psychoaffective State and Psychomotor Development of Institutionalized Infants: Pre-Intervention Infant Status*

*Attachment security.* In terms of attachment security, of the 62 infants, 29 (47%) showed a secure attachment and 33 (53%) an



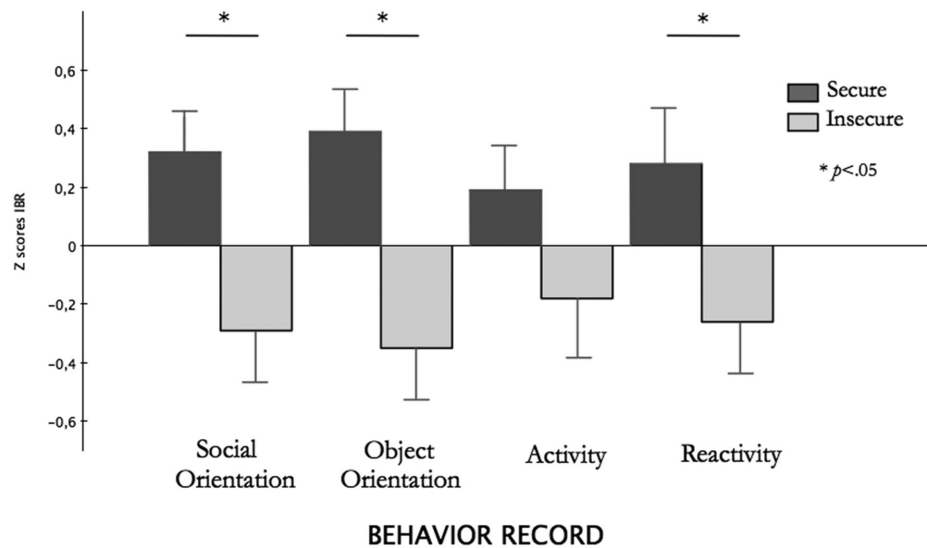


FIGURE 1. Standard infant behavior record (IBR) scores according to attachment security.

insecure attachment. In a sample of Chilean children raised by their parents, 130 dyads from the Metropolitan Region were evaluated using the Strange Situation Procedure. It was found that 70% presented a secure attachment and 30% an insecure attachment (Lecannelier, Kimelman, González, Nuñez, & Hoffmann, 2008), showing a greater proportion of secure attachment than that for the institutionalized infants in this study (0.73 vs. 0.47),  $z = 3.5$ ,  $p < .001$ . When the type of center is considered (private vs. public), it was found that attachment frequencies (secure vs. insecure) differed significantly,  $\chi^2 = 3.985$ ,  $p < .05$ . The proportion of secure attachment was greater in the private center (0.60 vs. 0.25),  $z = 2.0$ ,  $p < .05$ .

**Psychomotor development.** The frequencies of psychomotor development for the total sample were 40 (65%) normal, 16 (26%) at risk, and 6 (9%) delayed, showing a tendency toward normal development (According to national data, 30% of Chilean infants are at risk and delayed; Schonhaut, Alvarez, Salinas, & Armijo (2010)). The EEDP score varied significantly when the type of center was taken into account, with the private centers showing higher levels of psychomotor development,  $t = -2.530$ ,  $p < .01$ .

**IBR and attachment.** In Figure 1, the differences in the standardized scores of the IBR are identified according to attachment security (secure vs. insecure). In social orientation, object orientation, and reactivity, infants with secure attachment showed higher levels than did the children with insecure attachment. No differences were found between the two groups in the activity level. This latter aspect is consistent with the absence of significant differences between frequencies of psychomotor development categories (measured through the EEDP; normal, at risk, delayed) and attachment security,  $\chi^2 = 2.770$ ,  $p = .250$ . When considering the infants in a private versus a public center, higher levels of object orientation,

$t = -2.778$ ,  $p < .05$ , activity level,  $t = -2.201$ ,  $p < .05$ , and reactivity,  $t = -1.873$ ,  $p < .05$ , were found in the private center.

#### Pre-/Postinterventions Effects

To explore the effect of the intervention on the variables of interest (IBR and psychomotor development) according to the level of attachment security, a mixed analysis of variance was performed on these scores, with a group factor (Security vs. Insecurity) and an intra factor of the variable of interest (Pre/Post). In each case, the possibility of violating the assumption of variance homogeneity was explored through the Box's M test. None of these tests found evidence of the absence of this assumption,  $ps > .05$ .

In the case of the IBR, an effect of social orientation was found, qualified with a significant Group  $\times$  Social Orientation interaction,  $F(1, 40) = 5.834$ ,  $p < .05$ ,  $\eta^2 p = .125$ . As can be seen in Figure 2, the significant differences before the intervention,  $t_{posthoc} = 2.545$ ,  $p < .01$ , between secure and insecure attachment disappear after the intervention,  $t_{posthoc} = .629$ ,  $p = .533$ . In fact, unlike secure children, paired  $t$  test =  $-.803$ ,  $p = .433$ , the group of insecure children had significantly increased social-orientation levels, paired  $t$  test =  $-3.587$ ,  $p < .01$ , comparatively improving performance. In terms of object orientation, a pre/post effect was found, but the intrasubject effects test also revealed a Group  $\times$  Orientation interaction,  $F(1, 40) = 6.811$ ,  $p < .05$ ,  $\eta^2 p = .142$ . For social orientation, the insecure group reduced its significant differences prior to the intervention with the secure group,  $t_{posthoc} = 3.139$ ,  $p < .01$ , to statistical equality with this group,  $t_{posthoc} = .977$ ,  $p = .334$  (see Figure 3). Unlike social orientation, both the secure group, paired  $t$  test =  $-2.115$ ,  $p < .05$ , and the insecure group, paired  $t$  test =  $-2.228$ ,  $p < .001$ , saw their performance improve after the intervention. In the level of activity, the intrasubject effects test revealed only a significant pre/post effect,  $F(1, 40) = 14.231$ ,  $p < .001$ , of great magnitude,  $\eta^2 = .258$ .

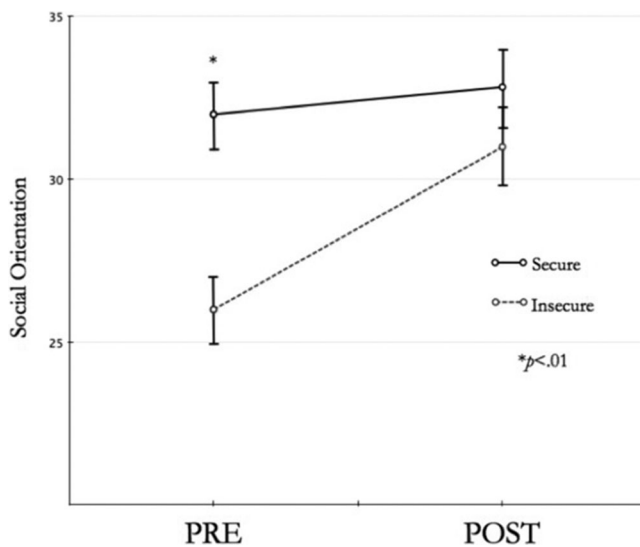


FIGURE 2. Interaction between attachment security and social orientation. PRE = pre-intervention performance; POST = postintervention performance.

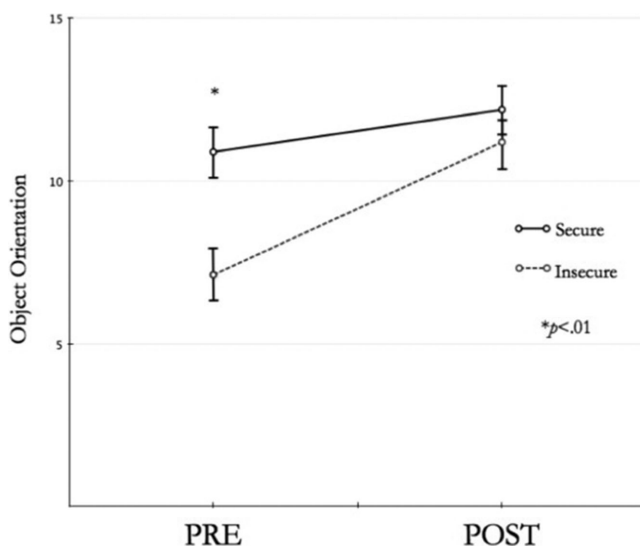


FIGURE 3. Interaction between attachment security and object orientation. PRE = pre-intervention performance; POST = postintervention performance.

Thus, independent of attachment security, the infants participating in the study increased their levels of activity after intervention, paired  $t$  test =  $-3.916$ ,  $p < .001$ . The group differences were not significant,  $F(1, 40)$ ,  $p = .066$  (Figure 4). In terms of the level of reactivity, the intrasubject effects test only revealed a pre/post effect,  $F(1, 40) = 9.378$ ,  $p < .01$ ,  $\eta^2 p = .186$ , where again all the infants increased their levels of reactivity independently of their attachment security, paired  $t$  test =  $-3.172$ ,  $p < .01$ . However, in this case, group differences were observed,  $F(1, 40) = 9.255$ ,  $p < .01$ , where the secure attachment group had higher reactiv-

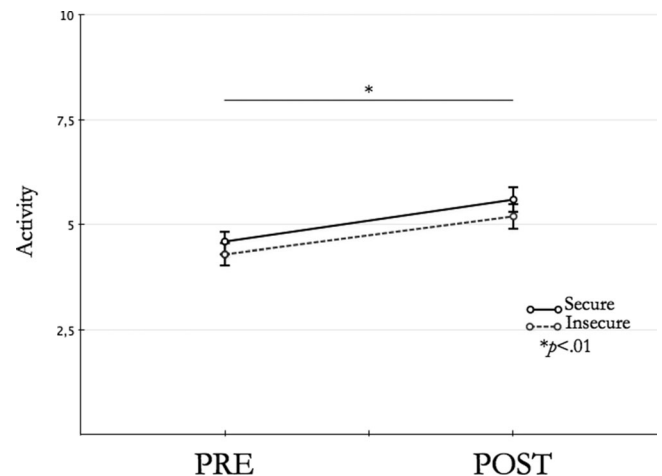


FIGURE 4. Pre-/post differences in the activity. PRE = pre-intervention performance; POST = postintervention performance.

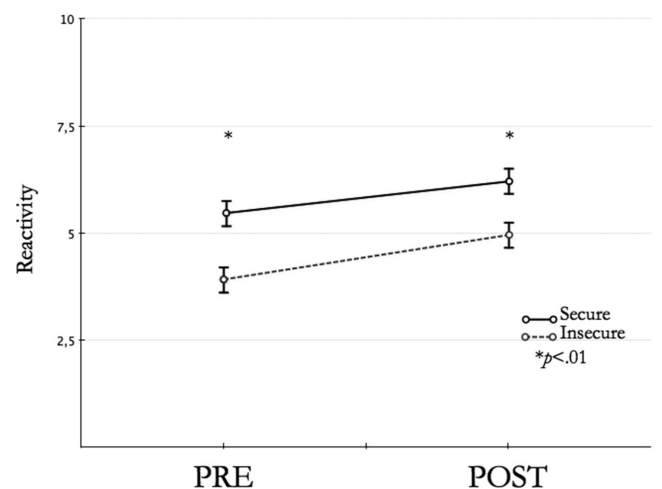


FIGURE 5. Pre-post differences and according to level of security in reactivity. PRE = pre-intervention performance; POST = postintervention performance.

ity levels both pre-evaluation,  $t_{posthoc} = 2.220$ ,  $p < .05$ , and postevaluation,  $t_{posthoc} = 2.466$ ,  $p < .05$  (Figure 5).

When considering the effect of the intervention on psychomotor development, no pre/post effects were found,  $F(1, 40) = .662$ ,  $p = .420$ , nor interaction with the attachment security categories,  $F(1, 40) = .731$ ,  $p = .397$ .

Finally, to assess the effect of the intervention on attachment security, a comparison was made of the frequencies of pre- and postintervention attachment security/insecurity. In this context, McNemar's  $\chi^2$  test with Yates' correction revealed no group differences,  $\chi^2 = 0.64$ ,  $p = .50$ .

## DISCUSSION

The results will be discussed on three levels of analysis: (a) the empirical evidence regarding the development of institutionalized infants, (b) the impact of the intervention, and (c) the effects on public policies regarding early institutionalization. Studies on early institutionalization have shown that there is little research on infants' development status in typical institutionalization situations (see McCall et al., 2010; St. Petersburg–USA Orphanage Research Team, 2008; Vorria et al., 2003), and most usually have been conducted in the postinstitutionalization stage (Dozier & Rutter, 2008).

In terms of psychomotor development, the results obtained are in ranges similar to those of normative samples of the mid and high socioeconomic levels in Chile, with a similar percentage in the range of a 30% deficit being observed (Schonhaut et al., 2010). In addition, international evidence has confirmed delays at the general cognitive level in institutionalized children (Morrison, Ames & Chisholm, 1995; van IJzendoorn, Luijk, & Juffer, 2008). A possible explanation of these contradictory results may be linked to the level of instrument validity. For example, in the context of the shortage of studies on early institutionalization in Chile, Martínez and Urdangarin (2005) evaluated 55 institutionalized infants, using three different scales to measure psychomotor development; they found that the EEDP demonstrated the lowest levels of risk discrimination (5% delay, similar to the 9% found in this study). They concluded that although the EEDP has been used for decades in Chile, it presents problems of validity and reliability.

In terms of attachment quality and security, it is important to clarify certain points. Given the infants' ages, it was not possible to use the "gold standard" measurement for attachment (Strange Situation Procedure) or to determine with clarity the specific pattern of attachment (because this is still in a stage of "attachment in the making" (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969; Lecannelier, 2009); therefore, it was not possible to determine levels of disorganization in attachment. Nevertheless, the results showed that institutionalized Chilean infants present levels of insecurity (53.2% of insecure attachment indicators) that are close to the international evidence presented in postinstitutionalization studies: 67% attachment with insecure organization and 30% disorganization (Chisholm, 1998); 40% disorganized attachment (O'Connor et al., 2003). The results are similar to the literature on institutionalized infants: 66% disorganized attachment (Vorria et al., 2003) and 65.3% disorganized attachment in Romanian children (Zeanah, Smyke, Koga, & Carlson, 2005), and they contrast with the frequency of attachment security among the general Chilean population (Lecannelier, Kimelman, González, Nuñez, & Hoffmann, 2008). On a clinical level, despite the difficulty in identifying specific patterns of attachment in this investigation, the children classified as "insecure" exhibited behavior quite similar to the disorganized or atypical type (absolute absence of crying, smiling, interaction, affectivity, and interest in establishing an emotional connection with an adult). Therefore, although more studies on infants over 12 months are needed, it can be hypothesized that

the percentage of insecure attachments could be understood as atypical and/or disorganized attachments.

In terms of the impact of the intervention, note that despite the brevity of the proposed intervention, the changes observed in the processes of social orientation, object orientation, level of activity, and reactivity were remarkable. For the first two variables, a significant interaction in the groups of secure and insecure children was observed, where the insecure children even managed to match the secure children's performance. This result is surprising considering that the time of institutionalization is usually one of the main variables that gradually impairs a child's psychosocial development (MacLean, 2003), which is why the intervention had the effect of not only presenting improvements from the pre to the post stages but also was able to counter the risk created by attachment insecurity in their relationships with the caregivers. In terms of activity and reactivity, although interaction effects were not observed, the intervention improved performance. A possible explanation for this difference in the behavior of the variables lies in one of the main components of the intervention, consisting of increasing the caregivers' skills in emotional connection through gazing, vocalization, and play; therefore, it was to be expected that increases in the areas of development related specifically to the components of socioemotional development (level of response to the caregiver, the evaluator, and people generally, interest in objects and the surrounding world) considered essential in the recovery from the adverse effects of institutionalization would be found (St. Petersburg–USA Orphanage Research Team, 2008). As a result, an increase in the infants' psychomotor development was not expected.

In terms of a general assessment of the intervention, we consider that the positive effects were related mainly to the use of a didactic, practical, comprehensible methodology organized in a manual adapted to the caregivers' sociocultural reality. Another element of impact was related to not having demanded the use of overtime work but rather optimizing the already existing socioemotional competencies of caregiving in the context of the daily care activities. The negative aspects include reduced intervention time, lack of training for the caregivers in topics referring to an infant's development, and more sensitive caregiving competencies as well as the high level of stress associated with the low salary that they receive. Nevertheless, these results are consistent with the existing evidence in intervention experiences in Latin America that have shown that long-term programs, with constant supervision in the promotion of sensitive, affectionate, and responsive care improve infants' development (McCall et al., 2010; McCall, Groark, Fish & the Whole Child International Team, 2008; Rosas & McCall, 2009). Therefore, the future directions of the intervention program proposed here must aim toward improvements at these levels, both at the level of the structure of the interventions and in the proposal of public policies to improve the conditions of currently existing centers.

Finally, in terms of the changes and improvements to the public policies on the care and sensitization of institutionalized children, note that because early institutionalization was a practice rooted

in Chilean public policy, a considerable amount of time (7 years) was needed for their implementation. In this context, the scope and repercussions of the investigation were wide and on several levels: First, it made various professionals from the social, medical, and legal fields aware of the negative effects (not known at the time) that early institutionalization has on a child's integral development. Second, it enabled a process of reassessment and improvement of the protection centers in terms of decreasing the children-caretaker ratio, lowering the residence times of the infants, improving the level of training and the professional and emotional attitude of the alternative caregivers, improving the physical infrastructure of the centers, and in particular, accelerating the processes of adoption or placing the children with families. Third, it heightened awareness of the early systems for detecting difficulties in institutionalized infants and the promotion of sensitive care by the caregivers in the centers at the national level. Fourth, since approximately 95% of institutionalized infants are usually adopted, the results of this study enabled adoption systems to incorporate the use of a postadoptive support system that aids in recovering an optimum development in the children. This program is being put into practice at the national level by the research team. Finally, this investigation launched a gradual process of implementation of a system of specialized foster families (El Programa de Familia de Acogida Especializada) that may gradually replace early institutionalization.

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