ISSN: 2710 - 0936 | ISSN-L: 2710 - 0936

Alternancia – *Revista de Educación e Investigación*

https://doi.org/10.37260/alternancia.v7n13.8

www.revistaalternancia.org

Vol. 7. No. 13 | July - December 2025| Pages 65 - 71

Estimulación psicomotriz en bebés durante los primeros 12 meses: impacto del uso parental del celular

Psychomotor stimulation in babies during the first 12 months: impact of parental cell phone use

Alexandra Paola Álvarez Santos
cynthia.hurtado@cuaad.udg.mx
https://orcid.org/0000-0003-1108-8370
Milagro State University, Milagro, Ecuador

Marjorie Geoconda Zamora Arana
geo_zamo@yahoo.es
https://orcid.org/0009-0006-5958-5754
Milagro State University, Milagro, Ecuador

Wilson Oswaldo Sanchez Macías
wsanchezm2@unemi.edu.ec
https://orcid.org/0009-0000-3003-1279
Milagro State University, Milagro, Ecuador

Andrea María Sanchez García
sandreaina@gmail.com
https://orcid.org/0009-0000-8895-3532
Milagro State University, Milagro, Ecuador

Received: February 20, 2025. Peer-reviewed: March 25, 2025. Accepted: May 5, 2025. Published: July 4, 2025.

RESUMEN

El estudio analizó la relación entre el uso del celular por parte de los cuidadores y la calidad de la estimulación psicomotriz en bebés durante sus primeros doce meses de vida. Se aplicó un enfoque cuantitativo con diseño no experimental, transversal y correlacional. Participaron cincuenta y tres díadas madre-bebé, y los datos fueron recolectados mediante observación directa, evaluación psicomotriz y cuestionarios estructurados. Los resultados evidenciaron que un mayor uso del celular por parte del cuidador se asoció con una menor calidad en la interacción responsiva, particularmente en las áreas del lenguaje, la motricidad fina y la socialización. Las madres con bajo uso del dispositivo mostraron mayor contacto visual, vocalizaciones dirigidas y respuesta afectiva oportuna durante la interacción con sus hijos. Se concluyó que la presencia constante del celular en contextos cotidianos interfiere negativamente en el proceso de estimulación psicomotriz, lo que subraya la necesidad de promover prácticas de crianza conscientes y libres de distracción digital.

Palabras clave:
Desarrollo infantil; Psicología del desarrollo; Tecnología digital; Estimulación temprana; Interacción madre-hijo

ABSTRACT

This study analyzed the relationship between caregiver cell phone use and the quality of psychomotor stimulation in infants during their first twelve months of life. A quantitative approach with a non-experimental, cross-sectional, and correlational design was applied. Fifty-three mother-infant dyads participated, and data were collected through direct observation, psychomotor assessments, and structured questionnaires. The findings showed that increased caregiver phone use was associated with lower quality in responsive interaction, particularly in language, fine motor skills, and social engagement. Mothers with low device use demonstrated greater eye contact, directed vocalizations, and timely affective responses during interaction with their infants. It was concluded that the constant presence of cell phones in daily contexts negatively interferes with psychomotor stimulation, emphasizing the need to promote mindful parenting practices free from digital distractions.

Keywords:
Child development; Developmental psychology; Digital technology; Early stimulation; Mother-child interaction

INTRODUCTION

The use of smartphones has radically transformed the dynamics of family interactions, especially during early childhood. The first 12 months of life constitute a critical period for a baby's psychomotor development, establishing the neurological and behavioral foundations that support later cognitive, emotional, and social development. Scientific literature has consistently demonstrated that early stimulation mediated by sensitive, consistent, and reciprocal interactions between the primary caregiver and the infant is essential for healthy psychomotor development (Baram & Bolton, 2018; Álvarez Santos et al., 2025).

However, the ubiquitous presence of mobile phones in the daily lives of parents has introduced new forms of distraction that significantly alter these essential interaction patterns. The concept of "digital parental distraction" has emerged as an emerging phenomenon with significant implications for the quality of emotional bonding and responsiveness during early childhood. Recent research indicates that cell phone use at key moments, such as during breastfeeding or face-to-face play, reduces both sustained attention and the frequency and quality of responsive interactions (Graff Nomkin & Gordon, 2021; Tidemann & Melinder, 2022).

This situation is especially concerning considering that approximately 95% of young adults, a significant proportion of first-time parents, own smartphones and remain connected for much of the day (Golds et al., 2025). Consequently, moments of uninterrupted contact between caregiver and infant can be fragmented by constant digital interruptions, compromising the consolidation of predictable stimulation routines, essential for the maturation of neurosensory circuits.

Developmental neuroscience has shown that infants not only passively receive stimuli but also actively emit signals that require adult interpretation and response. This two-way interaction loop is vital for optimal psychomotor development (Graff Nomkin & Gordon, 2021). In this context, excessive cell phone use by caregivers can negatively interfere, promoting erratic or inconsistent stimulation environments that compromise the infant's overall development.

Recent studies show that even brief interruptions in parental attention associated with cell phones cause immediate behavioral changes in infants, including decreased positive emotions, increased protest, and reduced social orientation (Tidemann & Melinder, 2022). Such changes directly impact the quality of gross and fine motor stimulation, as well as the development of language and early social skills.

From a neuroscientific perspective, Baram and Bolton (2018) warn that erratic parental cues, exacerbated by cell phone use, can disrupt key brain circuits for emotional regulation and motor learning. Braune-Krickau et al. (2021) add that smartphone absorption is associated with decreased responsiveness and sensitivity in interactions, negatively affecting infants' self-regulatory skills.

This study aims to analyze the impact of parental cell phone use on the quality of psychomotor stimulation that infants receive during their first year of life, identifying specific patterns of interference and proposing educational guidelines for digitally aware parenting in early childhood.

METHOD

A quantitative, non-experimental, cross-sectional, correlational research design was used. The sample consisted of 53 mother-infant dyads selected through non-probability convenience sampling. The inclusion criteria were primiparous mothers between 18 and 35 years of age with children between 0 and 12 months of age, without diagnosed neuromotor disorders. Cases with a high-risk perinatal history, use of psychotropic medication, or diagnosed severe technological dependence were excluded.

Data collection took place in community health centers and public daycare centers in urban areas over a six-month period. To assess psychomotor stimulation, the Haizea-Llevant Infant Development Scale, validated for the local population, was used. It assesses four dimensions: gross motor skills, fine motor skills, language, and socialization.

Parental cell phone use was measured using a structured and validated questionnaire that recorded frequency, context, and duration of use during interaction with the infant. Additionally, structured direct observations and video recordings of 15-minute mother-infant sessions in free play were used to document responsive behaviors, frequency of eye contact, and vocalizations.

Data were analyzed using SPSS v. 26 software, applying descriptive statistics and inferential tests such as Pearson's correlation and multiple linear regression, establishing a significance level of $\alpha = 0.05$. The procedure consisted of three phases: informed consent and questionnaire administration, behavioral observation, and psychomotor assessment, ensuring ethics and anonymity in accordance with the guidelines of the institutional bioethics committee.

Table 1. Average psychomotor stimulation scores according to cell phone use category

Cell phone use	Gross motor skills (M±SD)	Fine motor skills (FMS)	Language (M±DE)	Socialization (M±DE)
Low	23,5 ± 2,1	21,9 ± 1,8	20,4 ± 2,3	22,7 ± 1,5
Moderate	21,4 ± 2,5	20,1 ± 2,0	18,3 ± 2,7	19,5 ± 2,3
High	19,6 ± 2,9	18,7 ± 2,5	16,2 ± 3,0	17,1 ± 2,8

Note. M = mean; SD = standard deviation.

RESULTS

Data from 53 mother-infant dyads were analyzed to assess the relationship between parental cell phone use and the quality of psychomotor stimulation during the infant's first 12 months of life. The sample reflected a balanced distribution by child sex (50.9% girls, 49.1% boys), with maternal ages ranging from 19 to 34 years (M = 26.4; SD = 4.2). The average daily cell phone use time was 3.1 hours (SD = 1.2), with greater frequency during activities such as feeding, resting, and playing.

The usage categories (low, moderate, and high) were determined according to cutoff points established by the median of the sample distribution. Descriptive analyses revealed notable differences in the average psychomotor stimulation scores between the groups. Table 1 presents the mean values and standard deviations by cell phone use category.

The low-use group achieved the highest scores in all dimensions, especially in language and socialization, suggesting greater responsiveness and richness of interaction. Scores progressively decreased in the moderate and high-use groups, demonstrating a possible dose-response relationship between caregiver digital exposure time and lower quality of stimulation in the infant.

The analysis of variance (ANOVA) showed statistically significant differences between the groups in all the dimensions evaluated ($p < .01$).

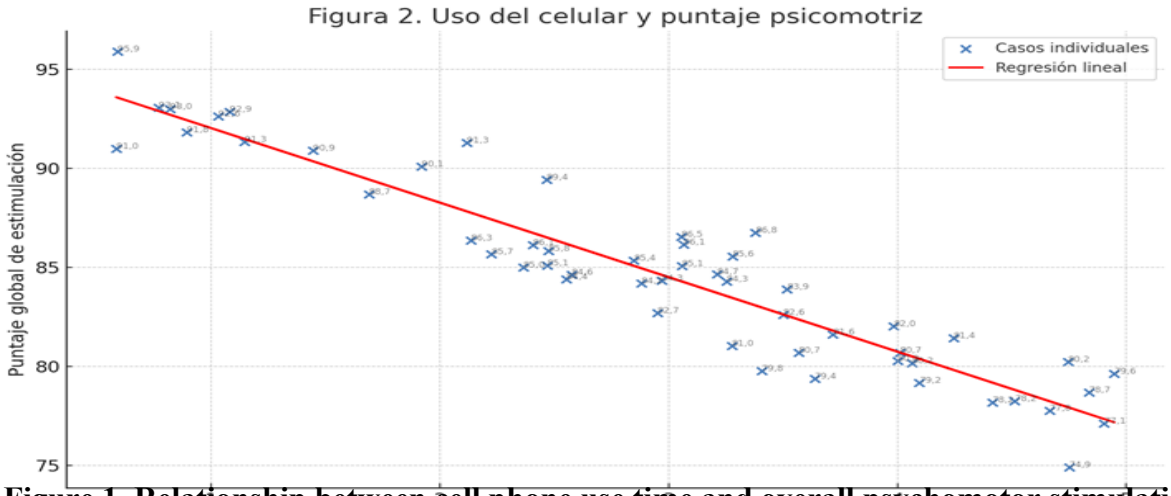

Figure 1. Relationship between cell phone use time and overall psychomotor stimulation score.

Note. Representation of the negative trend line obtained from the multiple linear regression model ($R^2 = 0.43$, $p < .001$).

For a more specific understanding, Table 2 describes the observed frequencies of interactive behaviors in free play sessions, according to the categories of cell phone use.

The results show a consistent pattern of declines in key interactive behaviors as mothers' cell phone use increases. Sustained eye contact, critical for socioemotional development, showed a 56% reduction between the low-use and high-use groups. Directed vocalizations, essential for language development, decreased by 63%, while contingent responding, crucial for children's self-regulation, decreased by 55%.

Table 2. Average frequency of interactive behaviors according to cell phone use

Observed behavior	Low usage (n=12)	Moderate use (n=18)	High usage (n=23)
Sustained eye contact	9,3	6,8	4,1
Directed vocalization	8,7	6,1	3,2
Contingent response	10,1	7,4	4,5

Note: Data obtained from direct observation in 15-minute sessions.

The greatest impact was observed in the language dimension ($F(2, 50) = 10.82$, $p < .001$), showing a decreasing trend in scores as parental cell phone use increased.

A multiple linear regression model was performed to identify significant predictors of the quality of psychomotor stimulation. The model was significant ($R^2 = 0.43$, $p < .001$), identifying cell phone usage time as a negative predictor ($\beta = -0.51$, $p < .001$), even after controlling for maternal age and educational level.

Discussion

The results of this study confirm that excessive cell phone use by caregivers is negatively associated with the quality of psychomotor stimulation received by infants during their first 12 months of life. This relationship was evident in all dimensions assessed, especially in language development and socialization, coinciding with the findings of Tidemann and Melinder (2022), who identified behavioral alterations in infants exposed to frequent interruptions in parental attention.

The language dimension showed the greatest impact, with a progressive decrease in scores as

cell phone use increased. This finding aligns with the observations of Micheletti et al. (2024), who found that mothers speak significantly less to their children during active device use. The 63% reduction in directed vocalizations observed in our study may affect lexical richness and the quality of linguistic input, fundamental elements for language acquisition in early childhood.

The impact on psychomotor development was not limited to language. The statistically significant differences in fine and gross motor skills, particularly in bimanual coordination and active exploration tasks, are consistent with studies such as those by Baram and Bolton (2018), which highlight the impact of erratic and inconsistent stimuli on the consolidation of neurosensory and motor circuits.

A relevant aspect is the persistence of the negative effect even when controlling for variables such as educational level, employment status, and number of children. This evidence suggests that intensive cell phone use acts as an independent risk factor for child development, beyond sociodemographic conditions. This conclusion reinforces the approach of Von Wyl et al. (2021), who argue that parental digital distraction represents a cross-cutting phenomenon that requires priority attention in child health policies.

The 56% reduction in sustained eye contact between the low- and high-use groups is particularly concerning, considering that this behavior is fundamental to the development of secure attachment and emotional regulation. According to Baram and Bolton (2018), inconsistent affective signals can affect the maturation of key brain regions, compromising processes such as emotional self-regulation and social interaction in the long term.

Among the study's limitations is the cross-sectional nature of the design, which prevents definitive causal relationships from being established. Furthermore, self-reported use of the cell phone use questionnaire may be subject to social desirability bias. However, the consistency between observational and self-reported data strengthens the internal validity of the results.

The findings underscore the need to design educational strategies aimed at promoting digitally conscious parenting, including workshops for parents on the impact of cell phone use on child development and practical recommendations on the appropriate use of technology in the presence of infants. Future interventions should include interdisciplinary approaches that integrate developmental neuroscience, child psychology, and early childhood education.

CONCLUSIONS

The results of this study suggest that intensive cell phone use by caregivers during the first 12 months of a baby's life is negatively associated with the quality of psychomotor stimulation received, with lower scores in language, socialization, and motor skills being observed compared to dyads with low device use. This relationship persisted even after controlling for sociodemographic variables such as educational level, maternal occupation, and number of children, suggesting a specific effect of the pattern of digital use on dyadic interaction.

Observational data indicated a significant decrease in responsiveness and frequency of key interactive behaviors when parental cell phone use was high, including reductions of 56% in sustained eye contact, 63% in directed vocalizations, and 55% in contingent responding. These findings reinforce the need to design preventive strategies that promote mindful parenting free from digital interference during critical stages of early psychomotor development.

The implementation of educational programs for parents and caregivers is recommended. These programs include information on the impact of cell phone use on child development, as well as practical strategies to optimize the quality of interactions during the first months of life. Future research should employ longitudinal designs to establish definitive causal relationships and explore specific interventions that promote patterns of technology use compatible with optimal infant development.

REFERENCES

Abels, M., Hendrickson, A., & Abeele, M. (2020). Are parents less responsive to young children when they are on their phones? A systematic naturalistic observation study. Cyberpsychology, Behavior and Social Networking, 23(6), 363-370. https://doi.org/10.1089/cyber.2019.0472

Álvarez Santos, A. P. (2024). Influencia de la estimulación sensorial durante la gestación en el desarrollo neuromotor temprano. Revista Científica de Salud y Desarrollo Humano, 5(4), 1808-1820. https://doi.org/10.61368/r.s.d.h.v5i4.428

Álvarez Santos, A. P., Mayorga Sánchez, H. T., Páez Merchan, C. A., & Leon Medrano, D. I. (2025). Impacto da utilização de ecrãs digitais no desenvolvimento cognitivo de crianças em idade pré-escolar. Revista Veritas de Difusão Científica, 6(1), 1698-1716. https://doi.org/10.61616/rvdc.v6i1.478

Ashrafinia, F., Moeindarbari, S., Ghazanfarpour, M., Razmjouei, P., Abdi, F., Ghalibaf, A., & Najafi, M. (2021). Can prenatal and postnatal cell phone exposure increase adverse maternal, infant and child outcomes? RBGO Gynecology & Obstetrics, 43(11), 870-877. https://doi.org/10.1055/s-0041-1736173

Baram, T., & Bolton, J. (2018). Parental smartphone use and children's mental outcomes: A neuroscience perspective. Neuropsychopharmacology, 44(2), 239-240. https://doi.org/10.1038/s41386-018-0184-8

Bestard Revilla, A., Bell Martínez, K., & Ramos Romero, G. (2022). El programa educa a tu hijo, una vía para desarrollar la psicomotricidad infantil. Revista Escuela, Familia y Comunidad, 1(1), 45-62. https://revistas.utmachala.edu.ec/revistas/index.php/escuela-familia-comunidad/article/view/672

Braune-Krickau, K., Schneebeli, L., Pehlke-Milde, J., Gemperle, M., Koch, R., & von Wyl, A. (2021). Smartphones in the nursery: Parental smartphone use and parental sensitivity and responsiveness within mother-infant interactions. Infant Mental Health Journal, 42(2), 161-175. https://doi.org/10.1002/imhj.21908

Carrión Arreaga, E. M., Valle Castro, A. S., Loja Sagbay, D. E., & Orbe Orbe, E. E. (2023). Conductas motrices básicas en el desarrollo integral de niños de educación inicial. Revista Escuela, Familia y Comunidad, 2(1), 51-62. https://revistas.utmachala.edu.ec/revistas/index.php/escuela-familia-comunidad/article/view/745

Coyne, S., Keenan-Kroff, S., Schvaneveldt, E., Essig, L., Stockdale, L., Booth, M., & Porter, C. (2020). Infants' response to a mobile phone modified still-face paradigm: Links to maternal behaviors and beliefs regarding technoference. Infancy, 25(5), 571-592. https://doi.org/10.1111/infa.12342

Golds, L., Gillespie-Smith, K., & MacBeth, A. (2025). Exploring the relationship between maternal wellbeing, infant development, smartphone use and technoference. Infancy, 30(1), 78-95. https://doi.org/10.1111/infa.70005

Graff Nomkin, L., & Gordon, I. (2021). The relationship between maternal smartphone use and infant development: A systematic review. PLoS ONE, 16(10), e0257956. https://doi.org/10.1371/journal.pone.0257956

Gueron-Sela, N., Davidovitch, M., & Rozenblatt-Perkal, Y. (2022). Infants' physiological and behavioral reactivity to maternal mobile phone use during mother-infant interaction. Computers in Human Behavior, 127, 107038. https://doi.org/10.1016/j.chb.2021.107038

Micheletti, M., Mikhelson, M., Luong, A., Khante, P., De Barbaro, K., & Etz, A. (2024). Mothers speak less to infants during detected real-world phone use. Child Development, 95(3), 1142-1158. https://doi.org/10.1111/cdev.14125

Shorey, S., Lau, Y., Dennis, C. L., Chan, Y. S., Tam, W. W., & Chan, Y. H. (2022). Evaluating the effects of the Supportive Parenting App on infant developmental outcomes: Longitudinal study. JMIR mHealth and uHealth, 11, e43885. https://doi.org/10.2196/43885

Tidemann, I. T., & Melinder, A. (2022). Infant behavioural effects of smartphone interrupted parent-infant interaction. The British Journal of Developmental Psychology, 40(3), 384-397. https://doi.org/10.1111/bjdp.12416

Torres Peña, C. M., Altamirano Cortez, S. P., Taco Taco, M. N., & Silva Delgado, M. de J. (2025). Impacto de técnicas de relajación sensoriomotoras en el desarrollo psicomotor de lactantes. Revista Científica de Salud y Desarrollo Humano, 6(1), 663-676. https://doi.org/10.61368/r.s.d.h.v6i1.502

Von Wyl, A., Pehlke-Milde, J., Gemperle, M., Braune-Krickau, K., Koch, R., & Schneebeli, L. (2021). Smartphones in the nursery: Parental smartphone use and parental sensitivity and responsiveness within mother-infant interactions. Infant Mental Health Journal, 42(2), 161-175. https://onlinelibrary.wiley.com/doi/10.1002/imhj.21908