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## ORIGINAL ARTICLE

# Factors predicting sensory profile of 4 to 18 month old infants

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### KEYWORDS

Infant;  
Child development;  
Environment

### Abstract

**Objective:** To identify environment factors predicting sensory profile of infants between 4 and 18 months old.

**Methods:** This cross-sectional study evaluated 97 infants (40 females e 57 males), with a mean age of  $1.05 \pm 0.32$  years with the Test of Sensory Functions in Infants (TSFI) and also asked 97 parents and 11 kindergarten teachers of seven daycare centers to answer the Affordances in the Home Environment for Motor Development-Infant Scale (AHEMD-IS). The AHEMD-IS is a questionnaire that characterizes the opportunities in the home environment for infants between 3 and 18 months of age. We tested the association between affordances and the sensory profile of infants. Significant variables were entered into a regression model to determine predictors of sensory profile.

**Results:** The majority of infants (66%) had a normal sensory profile and 34% were at risk or deficit. Affordances in the home were classified as adequate and they were good in the studied daycare centers. The results of the regression revealed that only daily hours in daycare center and daycare outside space influenced the sensory profile of infants, in particular the Ocular-Motor Control component.

**Conclusions:** The sensory profile of infants was between normal and at risk. While the family home offered adequate affordances for motor development, the daycare centers of the infants involved demonstrated a good quantity and quality of affordances. Overall, we conclude that daily hours in the daycare center and daycare outside space were predictors of the sensory profile, particular on Ocular-Motor Control component.

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**PALAVRAS-CHAVE**

Lactente;  
Desenvolvimento  
infantil;  
Meio ambiente

**Fatores preditores do perfil sensorial de lactentes dos 4 aos 18 meses de idade****Resumo**

**Objetivo:** Identificar os fatores ambientais preditores do perfil sensorial de lactentes dos quatro aos 18 meses de idade.

**Métodos:** Estudo transversal com 97 lactentes (40 do sexo feminino e 57 do masculino), comida de média de  $1,05 \pm 0,32$ , aos quais foi aplicado o Test of Sensory Functions in Infants. Responderam ao questionário Affordances in the Home Environment for Motor Development-Infant Scale 97 pais e 11 educadoras de sete creches, de forma a caracterizar o contexto familiar e de creche, e relacionou-se ao perfil sensorial dos bebês. O AHMED-IS é um questionário que caracteriza as oportunidades no ambiente para crianças entre três e 18 meses de idade. As variáveis que apresentaram uma associação significativa foram incluídas no modelo de regressão linear para determinar os fatores preditores do perfil sensorial.

**Resultados:** A maioria dos bebês (66%) apresentou um perfil sensorial normal e 34% deles encontram-se em risco ou em déficit (com problemas sensoriais). As oportunidades de estimulação na habitação foram classificadas como suficientes e nas creches foram avaliadas como boas. Os resultados da regressão revelaram que apenas os fatores “horas diárias na creche” e “espaço exterior de creche” influenciaram o perfil sensorial dos bebês, notadamente o controle oculomotor.

**Conclusões:** O perfil sensorial dos bebês situou-se entre o normal e em risco. O contexto familiar oferece oportunidades de estimulação suficientes e as creches demonstraram ter boas oportunidades. As horas diárias em creche e o espaço exterior em creche foram os preditores do perfil sensorial no controle oculomotor.

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**Introduction**

Early childhood is a phase of high neuroplasticity and neurological; and psychomotor changes contribute to better child development.<sup>1,2</sup> Motor development depends on the sensorimotor experiences offered by the environment. Infants understand and better perceive their world<sup>3</sup> through varied information from stimuli received by sight, sound, touch and object manipulation. An adequate sensory development is considered when it is in accordance with the sensory integration principles, which are related to the neurological bases and behavioral aspects. An adequate behavior is the result of an effective sensory integration.<sup>4</sup> Moreover, effective processing of sensory stimuli at cortical level is essential for the development of perceptive-motor, emotional and cognitive functions.<sup>5</sup> Biological maturation defines the parameters of child development, namely the structural and functional factors, such as body mass, height, strength and coordination; but the environment (physical, cultural and social context) and task demands influence the infant's sensory development.<sup>6</sup>

According to Caçola, Gabbard, Santos and Batistela,<sup>7</sup> recently there has been an attempt to associate children's sensory development with the environment, more specifically with the affordances, a term introduced by Gibson,<sup>6,8</sup> which refers to the interaction between the physical context in which the child is inserted and the existing stimulation opportunities (activities and toys), i.e., the way the context objects are organized and used. The evaluation of

affordances is crucial to better adequate these contexts to the children's needs and thus, assist their sensory development.<sup>9,10</sup> The findings of these studies emphasize that the availability of toys and the characteristics of the physical space promote infants' sensorimotor development in the first years of life,<sup>11-13</sup> as an adequate exposure to stimuli results in good sensory integration.

The family is the first context babies have contact with and it can provide not only stimulation and protection, but also risks for the development of these infants,<sup>13</sup> as the socioeconomic and cultural characteristics of each family can promote or influence stimulation opportunities for the child.<sup>14</sup> Regarding the childcare context in Portugal, according to Decree No. 262/2011 of August 31<sup>st</sup>,<sup>15</sup> the mandatory presence of a preschool teacher with the baby occurs only after the acquisition of walking. This legislation places more emphasis on basic hygiene and food, at the expense of stimulation and educational guidance directed at motor development. On the other hand, this decree points out that individualized care should be available according to the capabilities of each child, by providing educational activities, games and motor activities according to the age range and necessities of the children; however, it does not provide a technician that has been trained to implement this type of care. Regarding the physical space of the day-care, the Decree states that the indoor space must be divided into nursery, activity room with appropriate and safe toys, living and meal areas. The outdoor space must have a protected area for toys with wheels and an open

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