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## ORIGINAL ARTICLE

# Impact of extrinsic factors on fine motor performance of children attending day care

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Received 20 August 2015; accepted 22 January 2016

### KEYWORDS

Day care centers;  
Children;  
Preschooler;  
Child development;  
Fine motor dexterity;  
School health

### Abstract

**Objective:** To assess the impact of extrinsic factors on fine motor performance of children aged 2-years old.

**Methods:** 73 children attending public and 21 private day care centers were assessed. Day care environment was evaluated using the Infant/Toddler Environment Rating Scale–Revised Edition (ITERS-R), fine motor performance was assessed through the Bayley Scales of Infant and Toddler Development–III (BSITD-III), socioeconomic data, maternal education and time of start at the day care were collected through interviews. Spearman’s correlation coefficient was calculated to assess the association between the studied variables.

**Results:** The time at the day care was positively correlated with the children’s performance in some fine motor tasks of the BSITD-III, showing that the activities developed in day care centers were important for the refinement of specific motor skills, while the overall fine motor performance by the scale was associated with maternal education and the ITERS-R scale sub-item “language and understanding”.

**Conclusions:** Extrinsic factors such as higher maternal education and quality of day care centers are associated with fine motor performance in children attending day care.

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<http://dx.doi.org/10.1016/j.rppede.2016.03.007>

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## PALAVRAS-CHAVE

Creches;  
Crianças;  
Pré-escolar;  
Desenvolvimento infantil;  
Destreza motora fina;  
Saúde escolar

## Repercussões de fatores extrínsecos no desempenho motor fino de crianças frequentadoras de creches

### Resumo

**Objetivo:** Verificar as repercussões de fatores extrínsecos no desempenho motor fino de crianças de dois anos.

**Métodos:** Foram avaliadas 73 crianças de creches públicas e 21 de creches particulares. O ambiente da creche foi avaliado com a escala Infant/Toddler Environment Rating Scale-Revised Edition (ITERS-R), o desempenho motor fino pela escala Bayley Scales of Infant and Toddler Development-III (BSITD-III), dados socioeconômicos, escolaridade materna e tempo de ingresso na creche foram colhidos por meio de entrevista. Foi calculado o coeficiente de correlação pelo teste de Spearmann para verificar a relação entre as variáveis avaliadas.

**Resultados:** O tempo de creche apresentou correlação positiva com o desempenho das crianças em algumas tarefas de motricidade fina da BSITD-III, demonstrou que as atividades desenvolvidas nas creches foram importantes para o refinamento de habilidades motoras específicas, enquanto o desempenho motor fino geral pela escala estava relacionado com a escolaridade materna e com o subitem da escala ITERS-R "Linguagem e compreensão".

**Conclusões:** Fatores extrínsecos como maior escolaridade materna e qualidade de creches estão relacionados com o desempenho motor fino de crianças frequentadoras de creches.

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## Introduction

The first years of a child's life are characterized by constant biological and psychosocial changes, which lead to major acquisitions in the motor, social-affective, and cognitive domains.<sup>1</sup> During this period, the central nervous system (CNS) is constantly changing, myelination and synaptic organization reach the peak at 2 years of age, favoring the learning processes.<sup>2,3</sup> However, the CNS is not the only factor responsible for motor development, it is also related to the musculoskeletal development and cardiorespiratory fitness, all influenced by stimuli and environmental factors.<sup>4-7</sup> There is evidence that low socioeconomic status<sup>8-11</sup> and family and school environment of poor quality can negatively influence the development of healthy children,<sup>8,10,12,13</sup> while favorable environmental conditions, such as adequate stimuli, higher maternal education and socioeconomic status seem to positively influence children's motor and cognitive development.<sup>8,14-16</sup>

As for environmental factors, it is known that, since the late 1970s, women have become part of the labor market and required a place to leave their children during work hours. So, children began to spend much of their day in a different environment. However, in Brazil, with the approval of a national Law in 1996 (Lei Nacional de Diretrizes e Bases da Educação Nacional-LDB), the day care centers no longer have a social welfare aspect, but an educational character and are responsible for the "integral development of children up to 6-years old, in their physical, psychological, intellectual and social aspects, complementing the action of the family and of the community" (Art. 29 LDB). Rossetti-Ferreira et al.<sup>17</sup> highlight that children insertion in day care centers offers a possibility of additional stimuli, as they

interact with other children and caregivers. However, this benefit is directly related to the quality of the child care provided.

Under this new perspective, concern for the environment as a delineator factor of development in the early years of life has led some researchers to question the influence of the school environment as a space for children development,<sup>2,8,18-21</sup> since the lived experiences of those years are related to the cognitive<sup>22,23</sup> and motor<sup>5,24</sup> development in subsequent years, many children have the day care center as their main source of stimulation and interaction. In this context, it was found that day care centers with adequate equipment, good quality in the care and teaching methodology had positive influence on children development.<sup>2,15,25</sup> However, there are few studies assessing the school environment influence on fine motor skills of children at 2 years of age, period in which they begin to develop greater independence in daily activities and ability to use their hands functionally. Studies evaluating the fine motor performance among frequenters of Brazilian nurseries attributed the poor performance of children to the lack of quality of day care centers in Brazil.<sup>2,18,26</sup> However, this conclusion was based on studies that evaluated only the quality of day care centers in Brazil, without relating their impact on children's performance.

In a previous study that assessed the performance of children attending public and private day care centers, all with level B of socioeconomic status and aged 0 to 3 years, children attending public day care centers showed cognitive and fine motor performance lower than those in private day care centers. These results was attributed to possible structural and pedagogical differences between the types of day care centers, as the children showed no changes in

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