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Strategy Selection in ADHD Characteristics Children: A Study in Arithmetic

Francesco Sella[1], Anna Maria Re[1], Daniela Lucangeli[1], Cesare Cornoldi[1], and Patrick Lemaire[2]

Abstract

Objective: It has been argued that ADHD characteristics children have difficulties in selecting the best strategy when they accomplish cognitive tasks. The detrimental influence of these poor strategy skills may be crucial for several aspects of academic achievement such as mathematical learning. **Method:** Fourth- and fifth-grade children with ADHD symptoms and matched controls were asked to select the better of two rounding strategies in a computational estimation task (i.e., finding the best estimate of two-digit addition problems). **Results:** (a) Both control and ADHD children correctly executed a selected strategy, (b) ADHD children selected the best strategy less often than controls, (c) ADHD took more time to estimate sums of two-digit addition problems and provided poorer estimates, and (d) different factors predicted best strategy selections in each group. **Conclusion:** These findings have important implications for further understanding the sources of differences in cognitive performance between ADHD and control children.*(J. of Att. Dis. 2012; XX(X) 1-XX)*

Keywords

ADHD, strategy selection, arithmetic, computational estimation

ADHD is a neurobehavioral developmental disorder characterized by a persistent pattern of inattention and/or hyperactivity, as well as poor impulse control (American Psychiatric Association [APA], 1994). Meta-analytical studies have reported that the worldwide prevalence of ADHD is about 5.5% in children (Polanczyk, Lima, de Horta, Biederman, & Rohde, 2007) and 4.4% in adults (Kessler et al., 2006; U.S. sample).

The main theoretical explanation for ADHD symptomatology has been referred to *executive function* (EF) deficits with important weakness in planning, working memory, response inhibition, and vigilance (Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). Along with EF deficits, ADHD participants have difficulties in many general cognitive abilities such as memory, visuo-motor competencies, behavioral control, and social skills (Crawford, Kaplan, & Dewey, 2006; Seidman, Biederman, Monuteaux, Doyle, & Faraone, 2001). Castellanos and Tannock (2002) suggested that these deficits can be related to three main quantitative indices of disease risk (endophenotypes): a reduced delay gradient due to an impairment in rewarding circuitry, a strong intertrial and intraindividual variability may be related to deficits in temporal processing, and deficits in working memory.

ADHD is often coupled to academic difficulties or learning disabilities (LD; e.g., Barry, 2002; Faraone, Biederman, Monuteaux, Doyle, & Seidman, 2001; Mayes, Calhoun, & Crowell, 2000). The frequency of LD in children with ADHD has been estimated to vary from 15% to 44% for reading and from 31% to 60% for mathematics (Mayes & Calhoun, 2006). Most research about the comorbidity between ADHD and LD refers to reading disability (e.g., dyslexia). In contrast, mathematical disorders (MD) associated with ADHD have been much less often investigated despite their high association (Capano, Minden, Chen, Schachar, & Ickowicz, 2008). Research has shown that ADHD children often have arithmetic difficulties, are more rigid in strategy use, and have poor attentional control (Lucangeli & Cabrele, 2006). The most severe difficulties seem present when arithmetical reasoning and executive processes are required (e.g., Marzocchi, Lucangeli, De Meo, Fini, & Cornoldi, 2002), but difficulties may also concern basic number processing and calculation. For example, Zentall, Smith, Lee, and Wieczorek (1994) found that students with ADHD were slower and less accurate in number recognition and also in typing numbers. Kaufmann and Nuerk (2008) found that ADHD children, without LD and

[1]University of Padova, Italy
[2]Aix-Marseille University, France

Corresponding Author:
Francesco Sella, Department of Developmental Psychology and Socialization, University of Padova, Via Venezia 12/2, 35131 Padova, Italy
Email: francescosella@yahoo.it