



The influence of temperament and sex on inhibitory control games: reward strategies

Carolina Caffarena-Barcenilla^{1,2} · Cristian A. Rojas-Barahona³

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Abstract

Early childhood is a key period for the development of self-regulation skills. Inhibitory control is one of the self-regulation skills that are necessary in academic and social contexts to achieve better results. Studies have shown that older children's inhibitory control improves when a reward is presented. However, types of rewards and individual differences have never been fully investigated in a controlled situation. 149 children aged 4 to 5 years from a low socioeconomical background were assessed to measure inhibitory control (IC) in two different conditions embedded in a tablet game: IC with a predictive reward and IC with a non-predictive reward. Additionally, a measure reported by parents on their children's temperament was analysed. Results showed that (1) inhibition was higher in the predictive condition, (2) girls performed better than boys in both inhibition games, and (3) boys, whose temperament is characterised by a higher level of sociability had a better performance in the non-predictive reward condition. Moreover, boys whose temperament is characterised by a high energy level have poorer performance in the same task. In educational terms, having more background in the subject of rewards can allow more appropriate planning according to the objective, temperament characteristics and sex of the children.

Keywords Inhibitory control · Rewards · Temperament · Sex · Early childhood

The human capacity for self-control has been studied from different perspectives and has significant points of convergence. The review presented by Gagne (2017) synthesizes this information by pointing out that it is possible to understand self-control from three perspectives: delay gratification and willpower, the inhibitory control (IC) from the cognitive perspective (executive function) and the emotional and behavioral temperament dimension (effortful control).

This study has focused on the executive function (EF) and temperament approach. While both perspectives allude to self-control and self-regulating behavior, the nature of the response is understood differently. Whereas IC from the EF perspective emphasizes an inhibitory response as a higher order cognitive skill, the temperament perspective considers IC as a component of Effortful Control from the emotional and behavioral perspective. Additionally, temperament is understood from studies of individual differences among people, while IC is considered as a cognitive skill that regulates goal-directed behavior and is developed through training. This conceptual difference implies variations in assessment methods, beginning of study ages, outcome prediction, and the design of training and interventions (for more details, Gagne, 2017). The present study assumes these conceptual differences with the awareness that in order to understand each theoretical perspective in greater depth, it is necessary to design methods that adequately respond to the forms of research.

Some authors have addressed these perspectives with early childhood children, for example Fishburn et al. (2019) and Morasch and Bell (2011) which will be detailed below.

✉ Cristian A. Rojas-Barahona
c.rojas@utalca.cl

Carolina Caffarena-Barcenilla
ccaffare@uc.cl

¹ Faculty of Education, Pontificia Universidad Católica de Chile, Vicuña Mackenna 4860, Macul, Santiago, Chile

² Faculty of Education, Psychology and Family, Universidad Finis Terrae, Avda Pedro de Valdivia 1509, Providencia, Chile

³ Faculty of Psychology, Research Center on Cognitive Sciences, Millenium Nucleus for the Sciences of Learning, Universidad de Talca, Av. Lircay S/N, Campus Lircay, Talca, Chile