

## The role of the avatar in increasing attention, memory and wellbeing indexes in girls with Rett Syndrome

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Rett Syndrome (RTT) is a neurodevelopmental disorder mainly caused by mutations in the MECP2 gene (Berger-Sweeney, 2011). Phenotype includes severe linguistic, cognitive, motor and neurological abnormalities (Fabio, Giannatiempo, Antonietti, & Budden, 2009; Castelli, Antonietti, Fabio, Lucchini, & Marchetti, 2013; Fabio, 2017; Fabio, Gangemi, Caprì, Budden, & Falzone, 2018; Fabio, Magaudda, Caprì, Towey, & Martino, 2018; Gangemi, Caprì, Fabio, Puggioni, Falzone, & Martino, 2018). Due to the peculiar features of syndrome, people with RTT often use their eyes to communicate.

As known in scientific literature (Fabio, Giannatiempo, Oliva, & Murdaca, 2011; Djukic, Rose, Jankowski, & Feldman, 2014; Fabio, Giannatiempo, & Caprì, 2019), people with RTT focus their attention mainly on the faces of people they interact with (Fabio, Caprì, Nucita, Iannizzotto, & Mohammadhasani, 2018; Fabio, Caprì, Buzzai, Pittalà, & Gangemi, 2019). The typical virtual instrument with faces is the virtual avatar. The avatar has been shown to be an effective instrument in enhancing attention in other disabilities (Fabio, Caprì, Iannizzotto, Nucita, & Mohammadhasani, 2019), however, the use of virtual avatars for people with RTT has not yet been explored. This study aims at examining whether the use of the avatar can improve attention and memory processes in girls with RTT. 18 girls with RTT and 18 girls matched for mental age

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participated in the study. They were randomly submitted to two tasks (watching a video and overselectivity paradigm) presented in two conditions: with virtual avatar and without avatar (Tab. 1).

Table 1 – *Parameters evaluated in the proposed tasks*

Parameters	Measures
Attention	Fixation length (FL), which is the amount of time (seconds) spent by the girls when looking at the avatar.
Memory	Memory index: the number of items that the girls were able to remember after viewing the video in both conditions.
Happiness	Happiness index: the sum (presence) of each seven behaviors of the taxonomy of Van der Maat (1992): gaze direction, facial expression, sounds, mouth movements, physiological reactions, head movements and conventional gestures.

Results indicated that RTT group, when exposed to the virtual avatar condition, presented a statistically significant improvement in attention and memory abilities.

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