

## Preliminary Randomized Control Trial results show that *Wisdom* has a positive effect on emotion processing in children

Compared to a control group, reduced response times suggest that children who regularly play *Wisdom - Kingdom of Anger* seem to better deal with anger

Emotion processing plays a crucial role in learning. When sitting in a classroom, students are continuously exposed to a variety of triggers that may cause unwanted emotional responses, distracting them from learning. Automatic emotion regulation processes and emotional attention processes are critical in offsetting disruptions, especially those stemming from exposure to fear or anger. *Wisdom - Kingdom of Anger* is a tablet-based educational game that teaches children ages 4-8 to identify, label, express and manage their own emotions as well as those of the people around them.

A Randomized Control Trial study designed by researchers Charline Urbain (PhD), Julie Bertels (PhD), and Charlotte Van den Driessche (MD), from the *Center for Research in Cognition and Neuroscience* at Université Libre de Bruxelles (ULB, Belgium), assessed the impact of *Wisdom - Kingdom of Anger* on 1st graders' automatic emotion regulation processes and emotional attention processes, measured respectively by an inhibition task and a vigilance task (adapted from Urbain et al., 2017).

The final sample of this study included 40 children (19 *Wisdom* vs. 21 Controls; 24 girls and 16 boys; mean age (+SD) 81 months (3.3)). The experimentation took place in 2 schools and consisted of the following:

- pre-tests and post-tests that included an experimental emotional go/no-go task, questionnaires filled out by parents and teachers, and qualitative interviews
- 8 weeks of intervention, during which students played the assigned game (*Wisdom - Kingdom of Anger* vs. *Dragonbox Numbers*) on individual tablets for 10 minutes, 3 times a week

Results suggest that *Wisdom - Kingdom of Anger* has a positive impact on emotional attention

processes (elicited by a vigilance task, see Figure 1) in 1st grade students. Compared to the age-matched control group, students in the *Wisdom* group were significantly less distracted by the angry faces and better able to stay focused on their vigilance task (see Figure 2). A possible interpretation of this difference is that *Wisdom - Kingdom of Anger* enabled children to achieve better implicit processing of anger.

Therefore, it can be concluded that *Wisdom - Kingdom of Anger* may contribute to enhancing emotion processing, which in turn fosters students' learning outcomes.

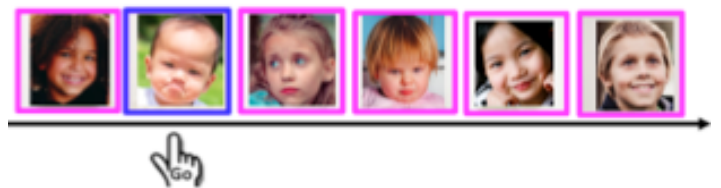


Figure 1: In the Vigilance Task (25% Go Trials) children were randomly exposed to angry and happy faces' and were asked to press the spacebar when the frame of the image was blue and to refrain from pressing the spacebar when the frame was purple.

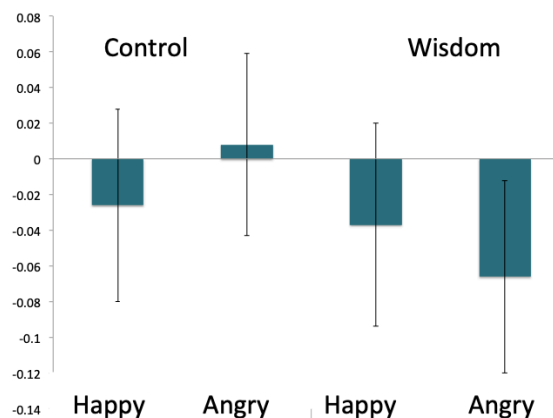


Figure 2: Difference between post-tests (Session 2) and pre-tests (Session 1) average reaction times<sup>2</sup> in milliseconds for the *Wisdom* group vs. Control group in the Happy and Angry conditions

<sup>1</sup> These images are for illustrative purposes and do not represent the images used in the vigilance task as they are under copyright from LoBue, V. & Thrasher, C. (2015). *The Child Affective Facial Expression (CAFE) Set: Validity and Reliability from Untrained Adults*. *Frontiers in Emotion Science*, 5. (2015).

<sup>2</sup> Behavioral analysis performed on reaction times (RTs) on go trials showed a main effect of Session (S) [ $F(1, 38) = 6.45, p = 0.015$  ( $S1 > S2$ )] and Task condition [ $F(1, 38) = 152.13, p < 0.001$  (Inhibition < Vigilance)]. An interaction between Session, Task, Emotion and Group [ $F(1, 38) = 7.77, p = 0.008$ ] was also identified. LSD Fisher post-hoc analyses showed that students from the *Wisdom* group had on average lower RTs to go stimuli in the angry condition during the second session in the vigilance task vs. the first session (25% Go Trials;  $S1 > S2, p < 0.001$ ). This aspect did not differ however for the happy condition ( $p > 0.4$ ) in the *Wisdom* group, nor for any emotional condition in the Control group for the vigilance task.