Background

- Inhibitory control (IC) has been shown to be a significant predictor for later school success and academic achievement[1-3].
- IC is characterized as the capacity to purposely suppress dominant, automatic or prepotent action tendencies for the benefit of more situation-adapted and goal-appropriate behavior[3-5].
- IC improves from early childhood to young adulthood.[6,7]
- Although research reveals that emotions have an impact on IC[7], there have not been coherent results, as to whether the involvement of emotional stimuli improves or reduces performance.[8,10]

Motivation of the study

- In the current literature response time (RT) was mostly measured cumulatively and not on a trial by trial basis.
- So far it is unclear whether happy or sad peripheral emotions lead to different RTs[8,11].
- Up to the present, no study included neutral face-expressions allowing to contrast happy or sad conditions with a neutral baseline condition[8,9,11].

Method

- **Stimuli, Apparatus:** Target stimulus (blue or white colored oval) depicted as the “nose” of a smiley, presented at tablet center.

- **Procedure:** After 6 training-trials, 6 blocks of 30 trials (3 blocks per condition) were conducted. Participants responded to the color of the oval by pressing the button in the lower left/right with either the same color in congruent blocks (i.e., blue-blue) or the other color in incongruent blocks (i.e., blue-white), while ignoring the emotional expression. Experimental phase started with the neutral condition to provide a baseline of interference control. After that, the order of congruency was counterbalanced across participants.

- **Participants:** N=34 third graders (n=14 female; 99-124 months of age [M=109.4, SD=5.3]; n=30 right-handed).

Results

- A 2(congruency) x 2(condition) ANOVA revealed a significant main effect of congruency (p<.001), indicating faster responses for congruent compared to incongruent trials (971ms vs. 1211ms).
- The 210ms Stroop effect in the sad condition (p<.001) was significantly smaller than the 269ms Stroop effect in the happy condition (p<.001).

Discussion

- For a more detailed understanding we took the baseline performance into account: A main effect of congruency (p<.05) showed a stronger decrease for incongruent compared to congruent RTs (-2.5% vs. -6.5%).
- This effect was modulated by type of condition (p<.05). While RTs for incongruent compared to congruent trials in the sad condition decreased significantly stronger (-8.6% vs. -2.2%; p<.01) this was not the case in the happy condition (-4.4% vs. -2.8%; p>0.05).

Raw Stroop effect

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Baseline-corrected Stroop effect

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