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Temperament and the Development of Higher Cognitive Abilities in 3- to 5-year-olds

Introduction
The current study investigated how temperament interacts with the development of higher cognitive abilities, such as language, theory of mind (ToM), and executive function (EF) in 3- to 5-year-olds. ToM refers to one's reasoning about one's own and others' mental states. EF refers to the processes required for conscious control of thought and action. Although preschoolers develop these abilities rapidly, individual differences exist. The present study examined whether individuals' temperament would be correlated with the development of such abilities.

Method
94 preschoolers (M age = 48.05 months) were given tests of language, EF, and ToM. Parents filled in the questionnaires on their children's temperament.

Verbal Intelligence Task
The Peabody Picture Vocabulary Test, Fourth Edition (Dunn & Dunn, 2006): Select the picture that best represents the meaning of a word presented.

EF Tasks
Social Less is more task (Qu et al., 2008): The child is shown two boxes (2 vs. 5 treats), and gets the treats from the box that she has not pointed to.
Dimensional Change Card Sorting (Frye, Zelazo & Palfai, 1995): Sort cards according to two dimensions, colour and shape.

ToM Tasks
Unexpected location false belief task (Wimmer & Perner, 1983): Children are asked where a puppet thought his ball was, after it was moved in his absence.
Unexpected contents false belief task (Gopnik & Astington, 1998): After discovering that a box actually contained something different, the children are asked about their former false belief.

Temperament
Child Behaviour Questionnaire (Rothbart, Ahadi & Hershey, 1994): 94 statements describing typical child behaviour. The items of the CBQ are grouped into 15 scales, such as fear and sadness, which further loads on 3 factors, such as effortful control.

Example:
Fear: "My child is afraid of loud noises."
Sadness: "My child tends to become sad if the family's plan don't work out."
Effortful control = Approach + Attentional Focusing + Inhibitory Control + Low Intensity Pleasure + Perceptual Sensitivity + Smiling and Laughter

Results
Language was correlated to effortful control (r=0.326, p=0.013), ToM was correlated to fear (r=0.326, p=0.013), and EF was correlated to sadness (r=-0.29, p=0.031).

Conclusion
Individual differences such as in temperament may interact with the development of higher cognitive function.

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