The Structure of Face Cognition in Childhood and Adolescence: In Search of Social Intelligence

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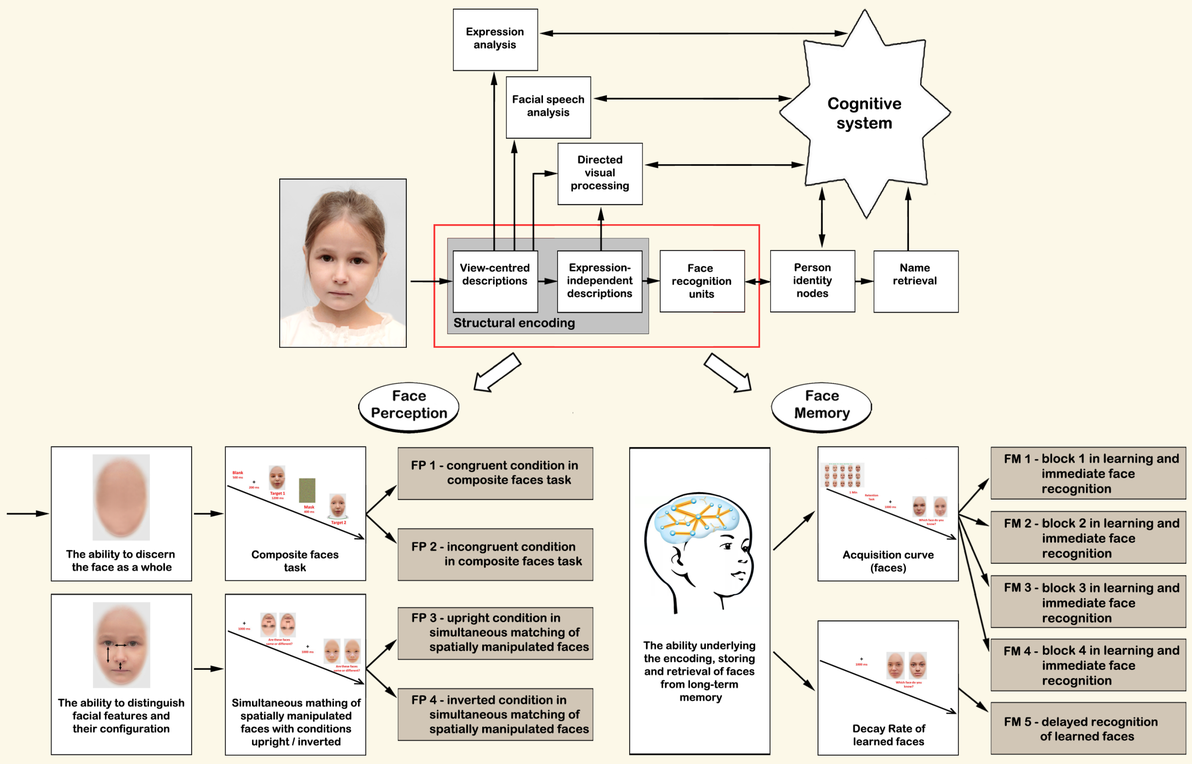
Faces are a rich and readily available source of social information. A harmonious **development** of **face cognition abilities**, such as **face perception**, their **memorization** and subsequent successful **recognition**, is crucial for the overall child development, as well as for children's adaptation to social life. The relevance to everyday functioning makes the mechanisms of face cognition abilities in childhood and adolescence a relevant research topic in developmental science. However, the **structure of individual differences** in these abilities during childhood and adolescence has not yet been studied.

The focus of the present study:

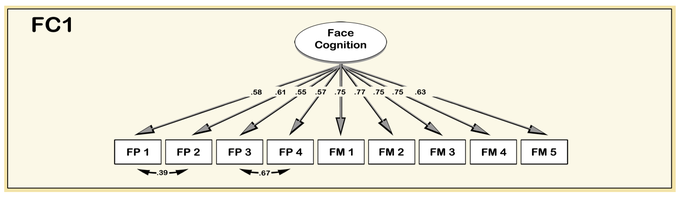
- **Establishment of the model of individual differences in face cognition in childhood and adolescence**
- **Investigation of structure invariance (verification differentiation hypothesis)**
- **Investigation of age differences in face cognition performance at the level of abilities (latent factors)**

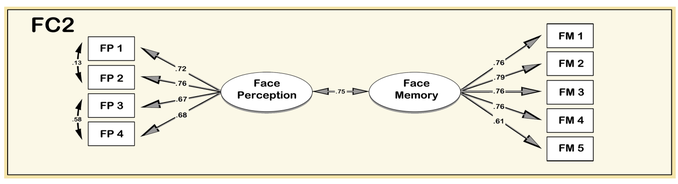
Methods

Participants: **338** children, adolescents, and young adults between **6 and 21 years** (50% females).



Results

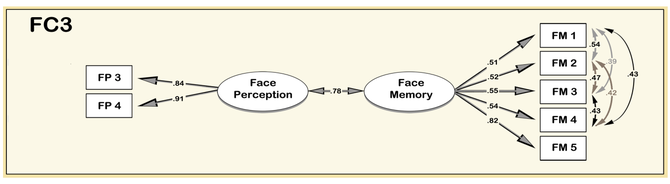




Schematic representations of the Measurement Model of Face Cognition including one general factor (FC1) and of the Measurement Model of Face Cognition including Face Perception and Face Memory (FC2).

Model	x^2	df	CFI	RMSEA	SRMR	$\Delta x^2(\Delta df)$
FC1	140.885	25	0.91	0.124	0.073	-
FC2	97.541	24	0.94	0.101	0.060	43.344*(1)

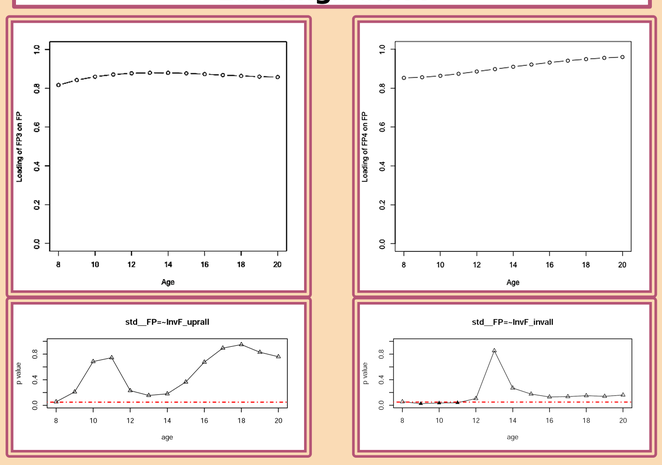
Model fit and comparison of FC1 and FC2 models
***p<.001- Alpha level was set to .01 in case of all statistical tests used in this study



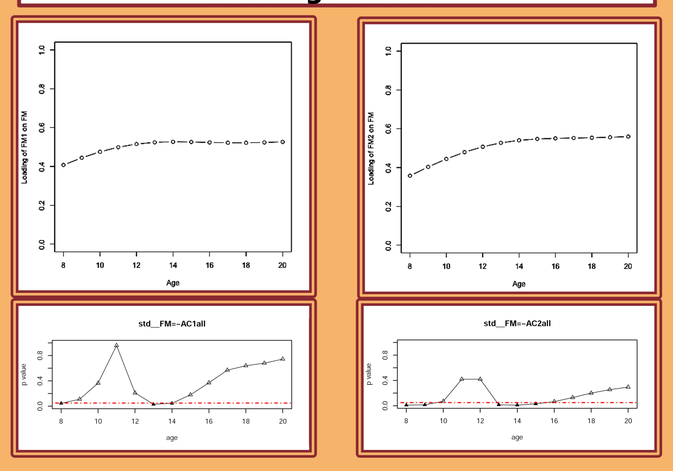
Model	x^2	df	CFI	RMSEA	SRMR
FC3	1078.874	21	1.000	.000	0.10

Schematic representations of the Measurement Model of Face Cognition including Face Perception and Face Memory without Composite faces task, and Model fit

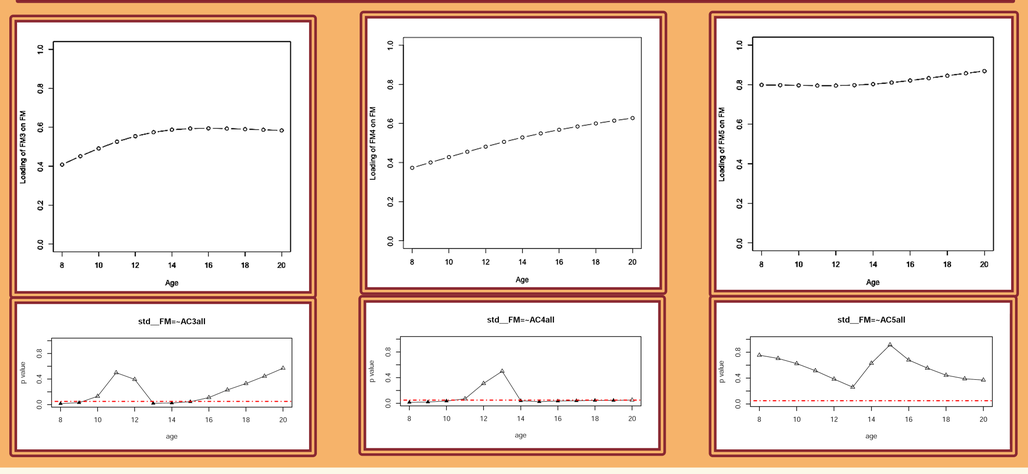
Loadings on FP



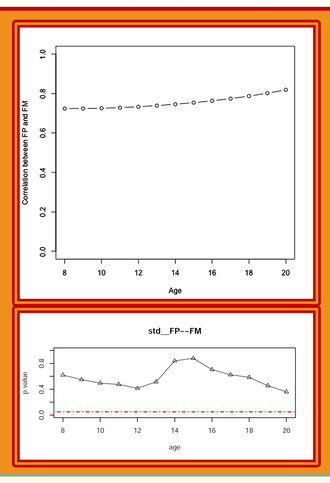
Loadings on FM



Loadings on FM

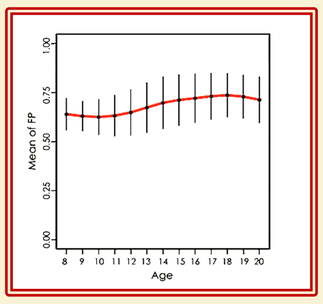


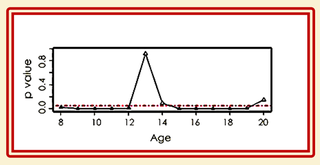
Correlation between FP and FM

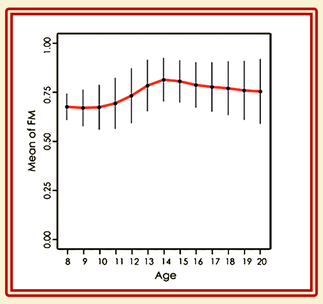


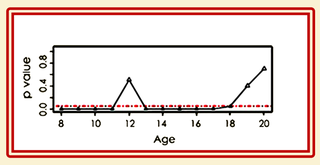
Above are represented estimated loadings for face perception, face memory and correlation between these factors across age, below - verification of p-values for these variations. If a parameter at a certain focal point of age deviates from the average gradient, the p-value would appear below the boundary represented as a dotted red line in the figure. Additionally, the solid triangles are displayed for those pointwise tests which reveal statistically significant deviations

Age differences on latent factor means









Above are represented estimated latent factor means in face perception and in face memory across age, below - verification of p-values for these variations. If a parameter at a certain focal point of age deviates from the average gradient, the p-value would appear below the boundary represented as a dotted red line in the figure. Additionally, the solid triangles are displayed for those pointwise tests which reveal statistically significant deviations.

Summary & Conclusion:

1. Model of individual differences in face cognition in childhood and adolescence can be represented as two-factorial structure including face perception and face memory, high correlated with each other, but still are distinct (r = .78).
2. The structure of face cognition is invariant across childhood and adolescence.
3. The structure of face cognition is adult-like already in early school age.
4. Performance in face cognition abilities becomes adult-like only in late adolescence.

5. Despite successfully adaptation of our new developed tasks battery, we can conclude that new version of the composite task (so called "complete design") should be interpreted carefully in the future research, because does not measure a specific holistic face processing ability