Letter familiarity but not recognition predicts improved discrimination of upright letters during emergent literacy phase in children

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Introduction:

Fluent readers search faster for upright compared to inverted letters/akshara, but precisely how this effect develops is unclear. One possibility is that associating letter shapes with their corresponding sounds leads to improved letter discrimination. Alternatively, repeated viewing of letter shapes even without knowledge of the sounds they denote could lead to improved letter shape discrimination. It is also possible that both shape-sound mapping knowledge and shape familiarity contribute to improved discrimination in unique ways.

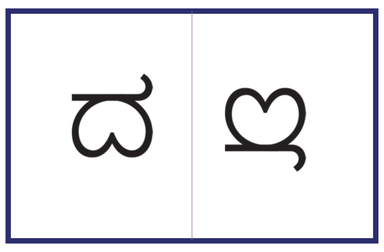
Experiment design and basic results

Stimuli: ದ ಒ ಜ ವ ನ ಣ ಅ ಆ ಇ ಈ ಖ ಗ ರ ದು ಳಿ ಲ್ಲಿ ನಾ ನ್ನು

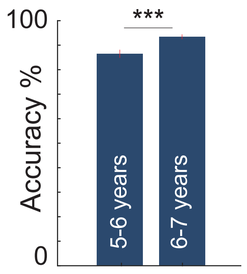
Participants:

We recruited 290 children (age 5-7 years) from LKG, UKG and Grade 1 across 13 schools of Karnataka.

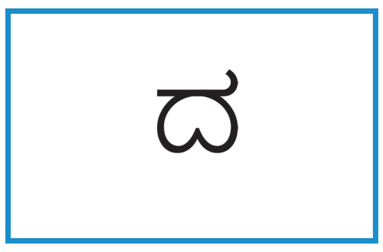
Akshara familiarity



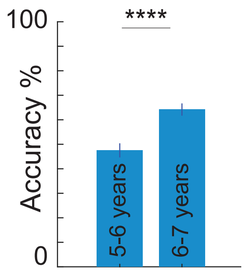
Which shape have you seen more?



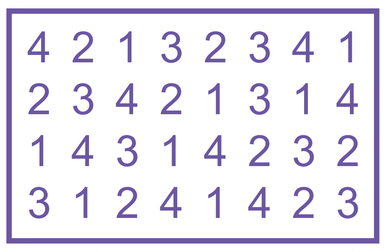
Akshara recognition



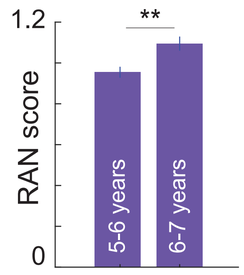
Name this Akshara.



RAN (Rapid Automatized Naming)

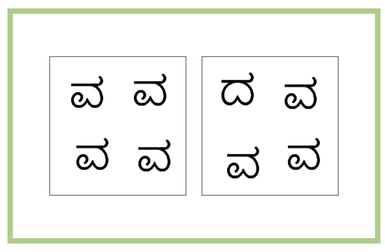


Name these numbers as fast as you can.

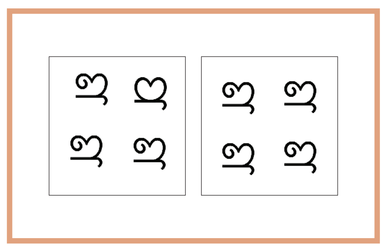


Akshara visual search

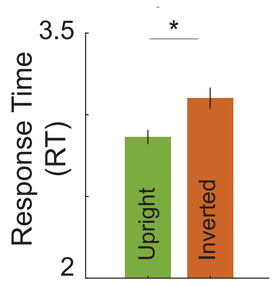
Upright search

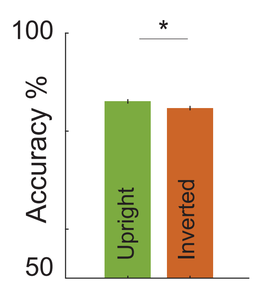


Inverted search



Which box has a different item?



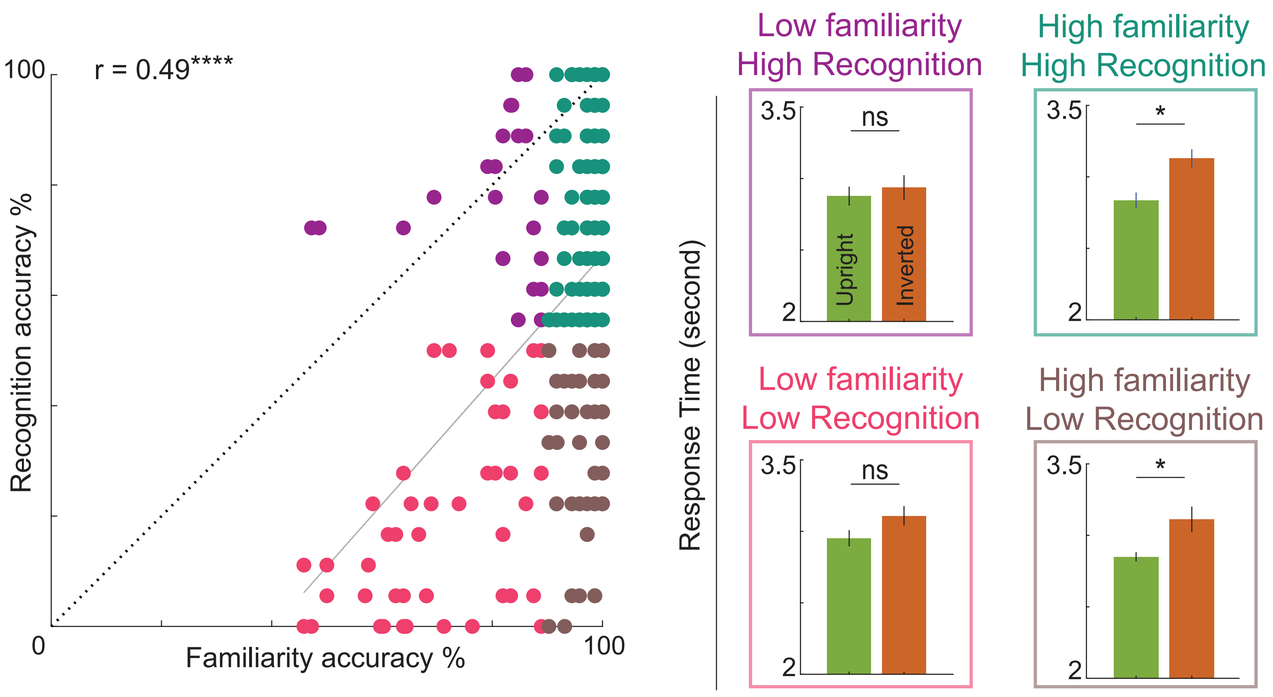


Older children (6-7 years, n = 112) are significantly better in akshara familiarity, akshara recognition and the RAN task compared to younger children (5-6 years, n = 105). Similarly, children from Kannada medium (n = 122) are significantly better in akshara recognition and the RAN task compared to children from English medium (n = 131) (data not shown).

Children discriminate upright letters faster and more accurately in visual search.

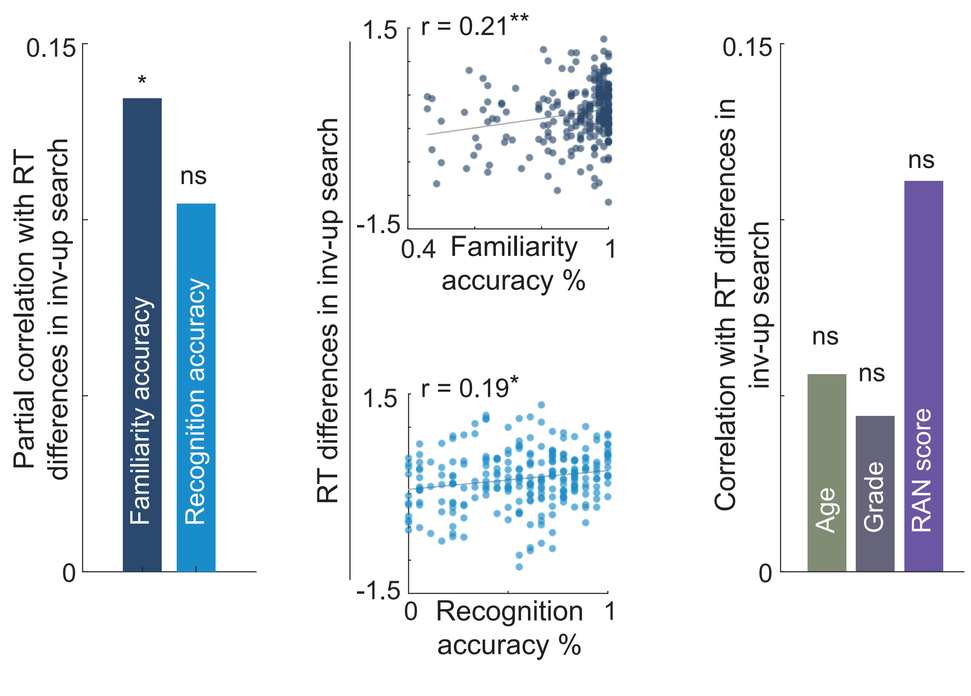
What explains better discrimination of Upright Akshara in children?

We divided children based on their familiarity and recognition accuracy.



Children with high (>90%) familiarity accuracy discriminate upright letters better than inverted letters in visual search, regardless of their recognition performance.

Predicting RT differences in inverted-upright search.



Upright letter search benefit across individual children is predicted by familiarity after controlling for recognition accuracy but not vice-versa. It is not predicted by age, grade and RAN score.

Conclusion:
Better discrimination of upright letters in children is driven by familiarity not recognition.

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