

Does a 'kiki' sound look spikey or round to you? Crossmodal Correspondence Across Development

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INTRODUCTION

We experience our everyday life with inputs from multiple sense. Sound/shape correspondence, our tendency to associate shapes (e.g. spikey vs round) with certain nonsense sounds (e.g. 'kiki' vs 'baba') could be a building block for word learning. This association has been found ubiquitously, regardless of language or cultural differences, yet has not been investigated across development. Here we examine how sound/shape correspondence develops.

We predicted the strength of crossmodal associations would increase as a function of early development and decline in older adults.

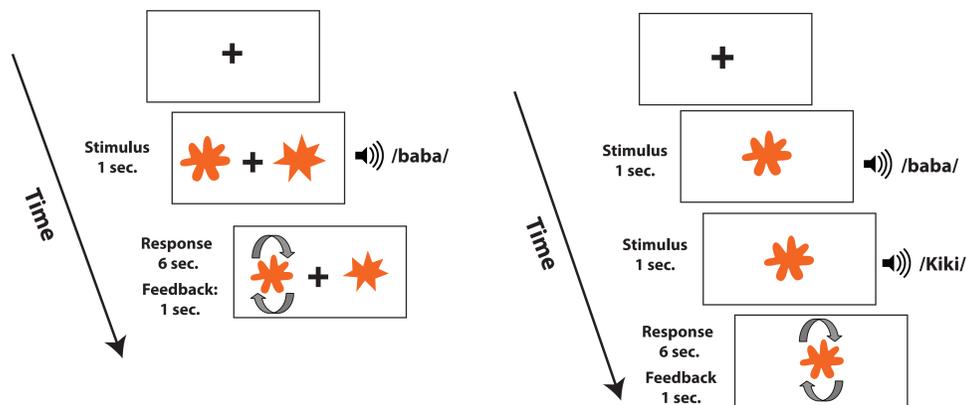
METHODS

Procedure

4 visual stimulus pairs
4 auditory stimuli
16 visual-auditory pairs
4 repeats of each pair
Total of 64 trials

Judging Shape (64 Trials)

Judging Sound (64 Trials)



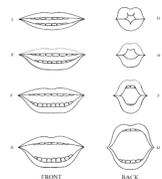
Stimuli

Visual Stimuli



Auditory Stimuli

⦿ /Kiki/ ⦿ /Baba/
⦿ /Titi/ ⦿ /Gaga/



Across trials we varied visual stimulus color, spikiness/roundedness as well as the auditory stimulus.

Analysis

Quantifying Choice for Judge Shape: We calculated the proportion of trials round shapes were chosen over spikey shapes for a given sound.

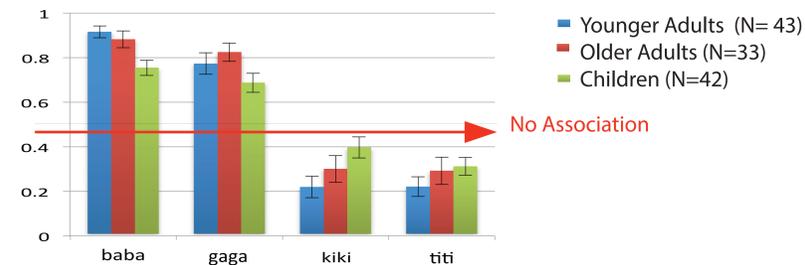
Quantifying Choice for Judge Sound: We calculated the proportion of trials sounds such as "baba" and "gaga" were chosen over "kiki" and "titi" for a given shape.

Quantifying Reaction Time: We calculated reaction time for choices made within the response window of 6 seconds allowed for making a judgement.

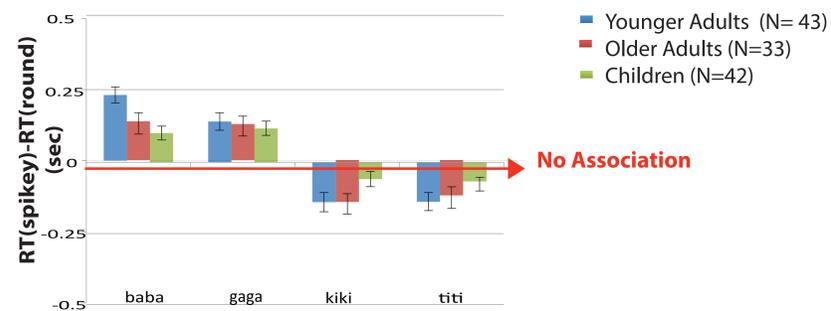
RESULTS

Judging Shape

Proportion of choosing round shape over spikey shape

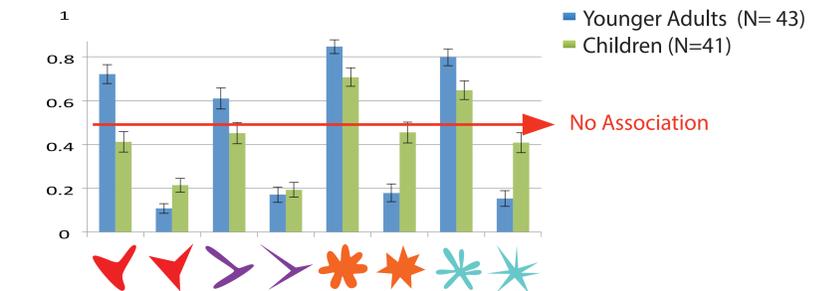


Reaction Time of choosing spikey vs. round shape

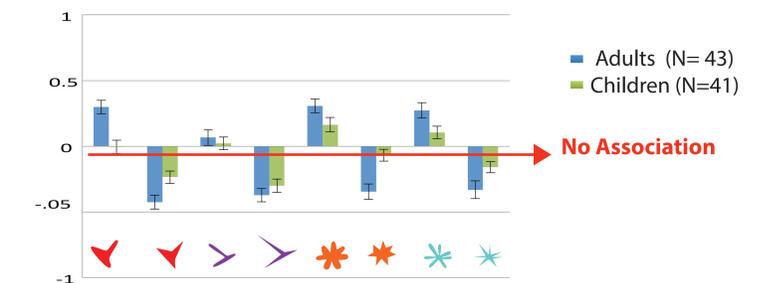


Judging Sound

Proportion of choosing 'baba'/'gaga' over 'kiki'/'titi' sound



Reaction Time of choosing 'baba'/'gaga' over 'kiki'/'titi' sound



CONCLUSIONS

Our results suggest "baba" or "gaga" are strongly associated with round shapes, and "kiki" or "titi" with spikey shapes in younger adults (age 18-38). Similar associations were present, but weaker in children (3-17) and older adults (above 38). Reaction times were on average faster when spikey shapes were chosen when presented with either "kiki" or "titi" sounds. The same trends were found in the complementary conditions of judging which shapes matches, given a sound, and judging which sound matches given a shape.

Although we have adequate sample sizes for data in young adults and children, more data is currently being collected in older adults in order to access how the strength of sound/shape associations changes over the course of development. Our data is being collected at the Living Laboratory, Museum of Science Boston, in simple short experiments, specially designed to be engaging for young children.

REFERENCES

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