Wired for Sound? Children show auditory dominance when determining the emotions of others

Researcher: Kaitlin Munro
Supervisor: Dr Paddy Ross, department of psychology

INTRODUCTION

- Determining the emotions of others in necessary for social cognition, and is linked to better social and academic outcomes
- Sometimes emotional signals from voice and body conflict
- Which signal people attend to depends on sensory dominance
- Sensory dominance is the phenomenon whereby one modality is processed over another
- Extensive research has shown adults are visually dominant - even sometimes not registering other inputs that are co-occurring!
- There is some research showing kids to experience the reverse: they show auditory dominance
- This changes at an unknown point as they age
- We have investigated whether younger and older children show auditory dominance when determining the emotions of others

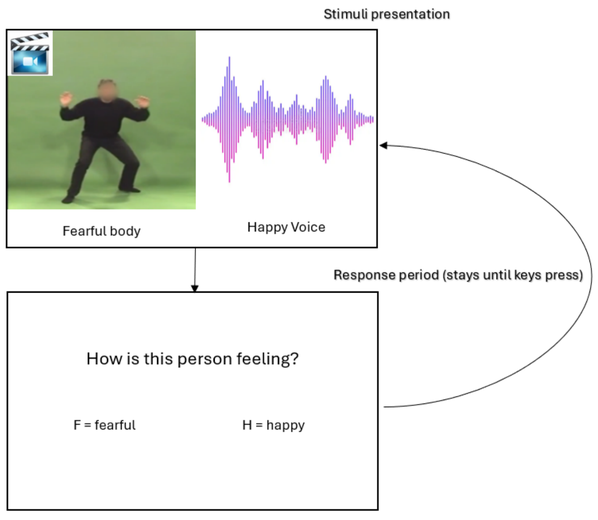
METHODS

Participants
- 98 children: 30 younger (aged 7 and under) and 68 older (8-11)
- Tested at the junior science fair at Durham University

Stimuli
- 10 bodily emotion clips selected for use per emotion
- 10 affective voice clips selected for use per emotion

Block 1 and 2: body and voice alone
- 12 bodies: 3 each of happy, fearful, sad, and angry
- 12 voices using the same configuration

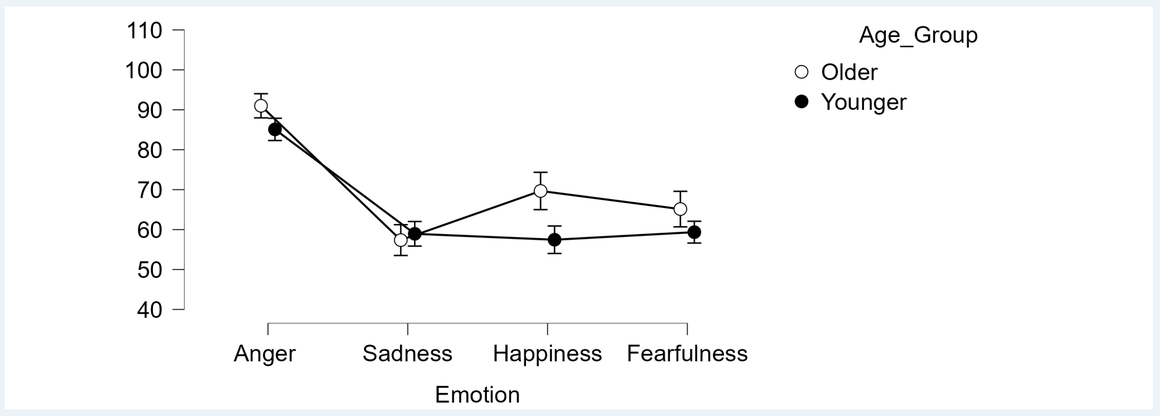
Block 3 and 4: combined stimuli
- Congruent stimuli: 5 each of happy, fearful, sad, and angry
- Incongruent stimuli: 5 each of sad body/angry voice, angry body/sad voice, happy body/ fearful voice, and fearful body/ happy voice
- Children were asked "how is this person feeling?"



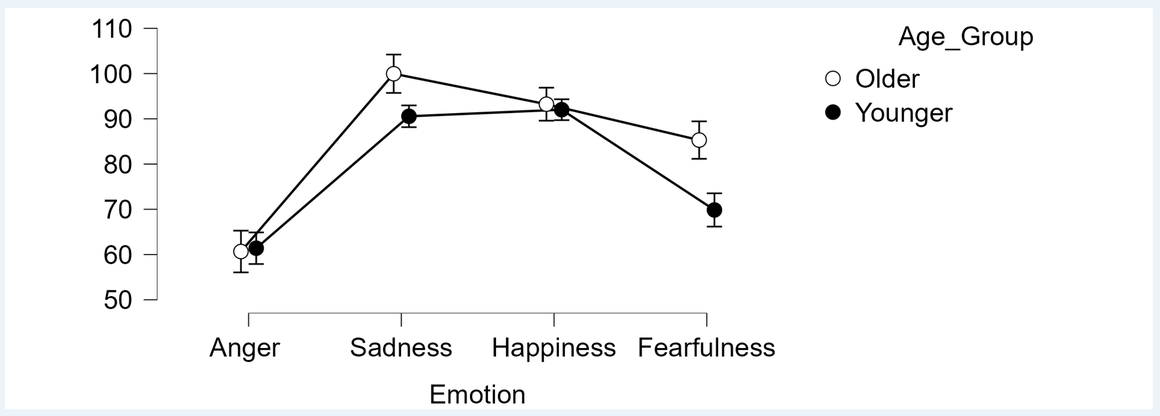
Example stimulus loop

RESULTS

Body and Voice alone
- Percentage accuracy calculated
- Children were more accurate in determining the voice alone than the body alone
- Older children were universally better at recognising emotion
- Happiness was the best recognised emotion; this showed significantly better performance than the worst recognised emotion, which was fear

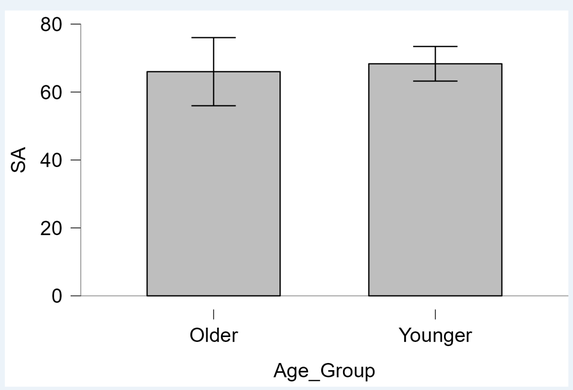


Body alone

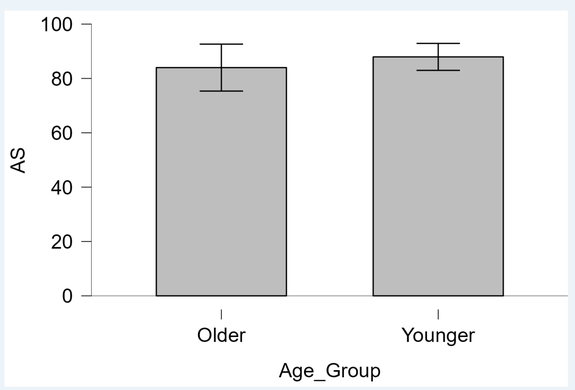


Voice alone

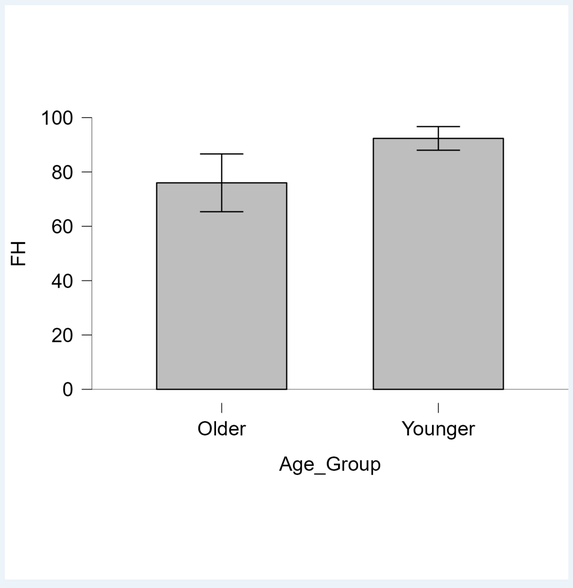
Combined stimuli
- Percentage of auditory based responding calculated
- Children in both groups displayed auditory dominance, reacting to the auditory stimuli significantly more often than chance
- There was a main effect of age: younger children showed increased levels of auditory dominance as compared to younger children
- Older children performed at chance level on the happy body/fearful voice condition
- In every other condition, children picked the auditory component of the bimodal stimuli more often than chance



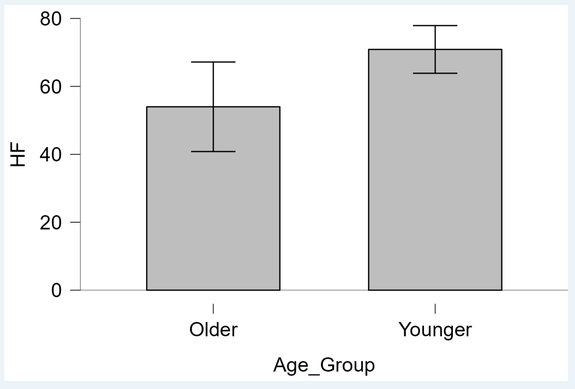
Sad body/Angry voice



Angry body/Sad voice



Fearful body/Happy voice



Happy body/Fearful voice

CONCLUSION

- Both younger and older children show auditory dominance when determining the emotions of others
- This is not likely to be the result of developmental differences given that recognition rates for bodies were similar and older children are more accurate in perceiving emotions from the voice
- There is a change from auditory to visual dominance as children get older, which seems to begin at around 8-11 years old
- This has implications for clinical populations such as ASD, as these populations may show a different trajectory of sensory dominance, remaining auditorily dominant for longer - this can be used for early screening
- This also tells us children are likely to spot emotions from the voice rather than the body - so putting on a "brave face" may not work!
- Several explanations of auditory dominance have been proposed, including modality appropriateness (the dominant modality is the one best suited to the task), attentional factors (a particular modality may capture attention better than another, or attention may be preferentially directed to a modality) and immature integration (children may not be able to properly integrate information from different modalities).
- Future studies could include teenagers and adults to establish a more concrete timeline of the trajectory of sensory dominance
- Our study is limited in that it does not establish the degree to which sensory information is integrated - it is likely that visual information also confound auditory information, albeit to a lesser degree

ACKNOWLEDGEMENTS

I would like to thank the Laidlaw foundation for providing this opportunity, and my supervisor, Dr Paddy Ross, for the time, effort, and insight he provided to this project.