Crossmodal integration of facial and vocal emotion in normal aging

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Introduction

In daily life, brain integrates informations from diverse sensory modalities simultaneously engaged for communicating. **Emotions** are often exprimed in multiple channels, specifically **facial and vocal expressions.**

Previous studies demonstrated that facial and vocal informations simultaneously and **congruently presented** facilitate emotion identification in young adults (Collignon et al., 2010). They also showed an **effect of normal aging** on emotion, as identification difficulties increasie after 70 (Chaby et Narme, 2009). Neverless, these difficulties vary according to the modalities.

In the present study, we investigate age effects on emotion recognition as well as the benefice of crossmodality in older adults compared to young adults.

Methods

Sujets

33 young adults (m = 24.64 ± 5.0) et **33 older adults** (m = 67.48 ± 6.0) ; MMSE > 28, BDI II < 19. All were right-handed.

Stimuli

The first version of this cross-modal task was presented in du Boullay et al (under review): 10 identities (5M,5W), **6 emotions**

→ 60 emotional **faces** (Lundqvist and Litton 1998; KDEF)

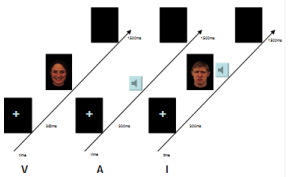
→ 60 emotional **vocalizations** (Belin, Fillion-Bilodeau, Gosselin, 2008)

→ 60 congruent **faces + vocalizations**

Experimental design

Multiple forced choise paradigm : mouse clicks on one of the 6 labeled buttons what appear at the bottom of the computer screen.

neutral | happiness | anger | fear | sadness | disgust



60 faces + 60 vocalizations + 60 crossmodal

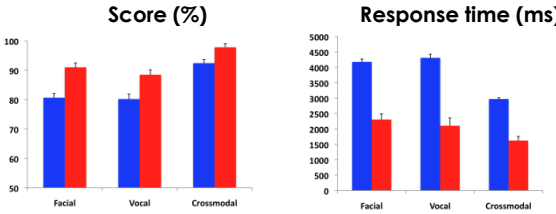
↓

180 trials

Results

Age effect

Young / Older



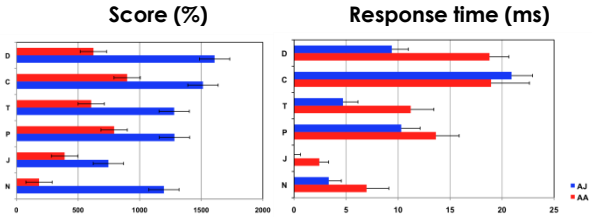
Older adults performed more poorly and less faster than did young adults in each condition

→ **Classical age effect**

In all adults, happiness and neutrality are best identified; the performance is poor for sadness and disgust; fear and anger are most difficult to identify

→ **Classical emotional effect**

Crossmodality effect



Crossmodal (facial-vocal) condition was more accurately performed than the unimodal (facial or vocal) condition; the average gain is 8% for accuracy and 583 ms for time processing in young adults and 12% /1272 ms in older adults.

→ **The audiovisual integration ability is maintained in older adults.**

Conclusion

For all conditions and all emotions, **older adults perform less accurately than young adults.** Furthermore, their response are slower, suggesting age-related decline in processing speed abilities.

Behavioral gain in crossmodal condition is observed in all groups. Older adults may benefit from crossmodal emotional information as well as young adults, thus neutralizing age differences.

Efficient abilities to use crossmodal emotional informations may help older adults in social situations (Hunter et al., 2010).

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Collignon, O., Girard, S., Gosselin, F., Saint-Amour, D., Lepore, F., Lassonde, M. (2010). Women process multisensory emotion expressions more efficiently than men. *Neuropsychologia*, 48, 220–225.

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