The Influence of Weak Central Coherence in Auditory Processing

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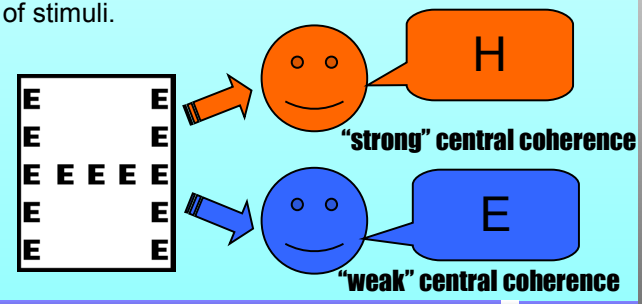
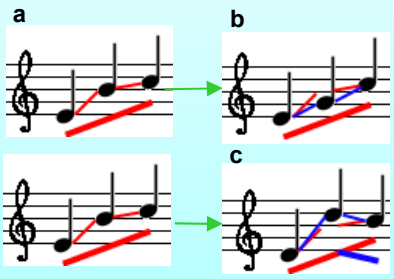
INTRODUCTION

It is thought that there is a **strong tendency of central coherence** for information processing in human. This tendency may contribute to contextual processing. On the other hand, It is thought that individuals with autism spectrum disorder (ASD) have a tendency of **weak central coherence (WCC)**. As the result, individuals with ASD may have a difficulty for understanding "Context". Therefore, they are thought to prefer to pay attention toward local feature of stimuli.



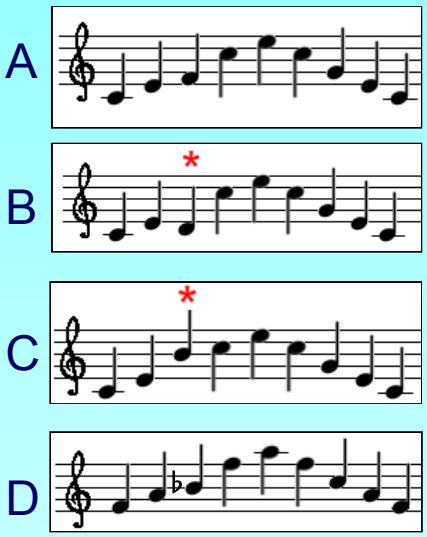
Hierarchical Auditory Stimuli



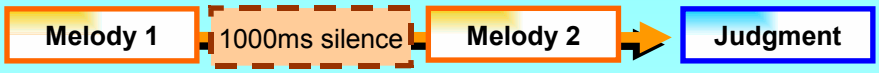
There is rising-rising contour in melody "a". In both melody "b" and melody "c", pitch of the second tone (interval) is changed. But in melody "b", the contour is still rising-rising. In melody "c", the contour is changed to rising-falling.

The influence of WCC in auditory processing has not been understood well. Then, we examined whether the perception for context in auditory serial stimuli is changed by the strength of central coherence. We think that WCC correlates with Autism spectrum Quotient (AQ). So, we classified participants as low AQ group (strong central coherence) and high AQ group (WCC) according to their AQ scores.

Stimulus (sample)



METHOD



All tasks consisted of same-different judgments of pairs of melodies. There were 4 kinds of conditions.

Global & Local cue condition
A → A (Same) A→B (Different)
Local cue condition
A → A (Same) A→C (Different)

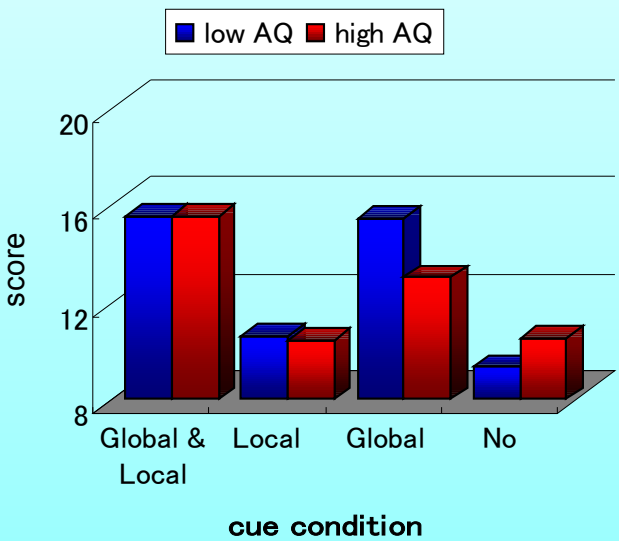
Non-transposed

Global cue condition
D → A (Same) D→B (Different)
No cue condition
D → A (Same) D→B (Different)

Transposed

There were 20 trials in each condition. Participants got 1 point if they answered correctly in the trial.

RESULT , CONCLUSION, and PERSPECTIVE



There was no difference in the condition with local cue in both groups. Performance in high AQ group decreased significantly in global cue condition without local cue. It is thought that the existence of local cue was important to recognize global cue in the high AQ group.

Therefore, it is suggested that more local information was needed in the high AQ group than the low AQ group.
Thus, the individuals with high AQ may not be able to recognize global aspect sufficiently in the melody.

Thus, exact recognizing of global aspect in auditory processing may be difficult for the individuals with high AQ score, so much more for individuals with ASD. Atypical neural development for central coherence may happen in individuals with ASD. So, the neural basis of these phenomena are needed to investigate using event-related potentials and magnet encephalography.