Performance On A Contour Integration Task As A Function Of Contour Shapes: A Comparison Study Between Individuals With Schizophrenia And Neurotypical Individuals

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Question: How does performance on contour integration (CI) differ between patients with schizophrenia (SP) and neurotypical individuals (NT)?

Contour Integration (CI)
- Ability to integrate elemental features and form a coherent percept
- Sensitive to changes in various parameters such as orientation jitter (OJ) and spacing between the elements (IN) (Pettet., 1999; Braun., 1999)
- Impaired in SP (Ulhass & Silverstein., 2005; Silverstein et al., 2012)

Objective: Systematically compare performance of SP and NT on a range of contour shapes that differ on closure, curvature, and configural form.

METHODS

Participants:
- 15 NT and 24 SP
- 3 recruitment sites:
  - Weill Cornell Medicine (N = 11)
  - Nathan S. Kline Institute for Psychiatric Research (N = 13)
  - University of California, Riverside (N = 15)

Stimuli: Contours and distractors made up of Gabor elements

Adaptive parameters:
- Orientation Jitter (OJ) and Inducer Number (IN) of individual elements

Data collection: Up to 40 sessions with each session comprising of multiple contour types

RESULTS

- Are there differences between SP and NT? Yes, ANOVA showed significant differences on OJ (F=7.706, p < 0.01) and IN (F=17.094, p < 0.001).
- Are there differences between shapes? Yes, ANOVA showed significant differences between the contour shapes on both OJ (F=83.282, p < 0.001) and IN (F=704.824, p < 0.001). The shapes differed on both curvature and closure.
- Are there interactions between participants and shapes? Yes, but is complicated. ANOVA showed significant interaction effects between the groups and shapes for OJ (F= 4.492, p = 0.001) and IN (F=12.618, p < 0.001)

INTRODUCTION

CONCLUSION

Significant differences between
- SP and NT
- Contour Shapes
- Effects of closure and curvature were observed but were not different between SP and NT
- Performance on complex contours such as spiral, blobs and letters appear to show greatest differences between SP and NT

REFERENCES


Figure 1: Task structure for a single block of 120 s with multiple trials of a maximum duration of 8 s

Figure 2: Orientation Jitter (A) and Inducer Number (B) thresholds for all contour shapes (figures below).