Holistic Processing of Body Configurations in Congenital Prosopagnosia

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Background information

Previous studies suggest that the identity of the human body is processed visually in a holistic fashion. Furthermore, recent studies in this field provide evidence that not only identity information, but also postural information is visually processed holistically[1-2]. Holistic processing of body postures is defined as the processing of the hierarchical interconnectivities and relations between limbs, head, and torso. Congenital prosopagnosia patients, a disorder characterized by innate facial recognition and discrimination problems, seem to rely more on other cues to recognize and discriminate between people[3]. The current study explores whether these patients show modified proficiency in body posture discrimination in comparison to healthy, age-and-gender matched controls. The current experiment is a direct follow-up to a previous set of experiments exploring face processing proficiency in CP patients and healthy controls.

Methods

Subjects clinical interview[5] to test for everyday severe face recognition problems without being linked to demonstrable brain damage.

>> 5 congenital prosopagnosia patients (age: 24-36, 4 females; abr. CP)

>> 5 age-and-gender matched, healthy controls (age: 24-36, 4 females; abr. MC)

Task delayed matching-to-sample of body postures of body halves presented in the context of a whole body

>> Task 1: do the upper body halves have an identical or different posture, regardless of the lower body halves?

>> Task 2: do the right body halves have an identical or different posture, regardless of the left body halves?

Effect composite effects as measured by congruency effects[4] in reaction times and sensitivity measures (d’)

Combining two body halves (A, B) results in a composite image (AB). Comparing parts between composite images can result in a perceptual conflict, but only when there is an incongruency. Misaligning body halves might alleviate this perceptual conflict as the whole becomes disrupted.

Results & Discussion

Task 1: Horizontal composite effects

- no pronounced differences in #errors: CP (10) = MC (13)
- BUT overall low consistency within CP group (d’)
- similar sensitivity results for CP & MC: aligned > misaligned
- CP (920ms) overall slower than MC (620ms)
- slight differences between CP and MC:
  misalignment has an inhibiting effect in CP in contrast to MC

Task 2: Vertical composite effects

- no pronounced differences in #errors: CP (12) = MC (15)
- BUT still some inconsistencies within CP group (d’) and MC group
- similar sensitivity results for CP & MC: overall congruency effect
- CP (920ms) overall slower than MC (650ms)
- comparable congruency effects for CP and MC:
  same-aligned trials are the main source of congruency effects

⇒ Similar degrees of holistic posture processing, albeit the underlying mechanisms are slower and subject to individual differences.

References