

Title: The perceptual sensitivity to second-order facial relations in Williams syndrome

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Abstract:

As opposed to adults that use configural information to perform an "expert" processing of facial information (for a review, see Maurer, Le Grand & Mondloch, 2002), people with Williams syndrome were supposed to rely on the processing of componential or local information. However, this point gave rise to various observations and conclusions in the literature. We suggest that this discrepancy may reflect the fact that people with WS could be impaired for some kind of configural information — second-order relations (i.e., fine spatial information such as distance between features) — but intact for another kind — holistic information (features are perceived as a single gestalt).

To test for this hypothesis, we look into sensitivity to second-order facial relationships by considering discriminability thresholds, i.e., minimal feature spacing a participant is able to detect. The procedure and materials were the same than those used by Baudouin et al. (2008) with Schizophrenic patients. Eleven adults with Williams Syndrome were asked to state whether the distance between the eyes was the same in two side-by-side faces or not. Considering the two faces were the same except for eye spacing, the distance between eyes was varied across trials in order to determine the minimal distance participants were able to detect. The two faces were either upright or upside-down, depending on the session. If children's perceptual ability to process second-order relations develops with age, they should need a larger space than adults to see a difference. Our procedure allowed us to quantify how much larger this distance had to be at each age.

The results indicated that, overall, despite of adult-like performance at the Benton test, adults with WS performed at a similar level to children matched for non-verbal mental age. The minimal spacing they were able to detect was about 2.75 times larger than for healthy adults.

We concluded that, even if people with Williams syndrome process holistic configural information, they display deficits in the processing of second-order configural information. One could hypothesized they compensate for these deficits by relying on featural processing.

Maurer, D., Le Grand, R., & Mondloch, C. J. (2002). The many faces of configural processing. *Trends in Cognitive Sciences*, 6, 255-260.

Baudouin, J.-Y., Vernet, M., & Franck, N. (in press). The processing of second-order relational information in face in schizophrenia. *Neuropsychology*.