The Spatial Divide: Memory for Faces is a Relative Strength in Adults with Williams Syndrome

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Introduction

- Williams Syndrome (WS) is a rare disorder caused by a hemizygous deletion of about 28 genes on chromosome 7.
- Individuals with WS typically have mild to moderate mental retardation as well as an uneven cognitive profile. Of note are the distinct areas of relative strength in language and the disparity between poor spatial and good face processing skills [1,2].
- The relative strength in face processing is of particular interest considered in the context of this group’s widely-noted ‘hypersocial’ behavior [3].
- Studies of memory abilities in individuals with WS report uneven performance across different memory domains, specifically relatively good short-term verbal memory and relatively poor short- and long-term spatial memory [4].
- Despite anecdotal evidence that individuals with WS are good at remembering the people they meet, memory for faces in adults with WS is relatively understudied.
- The present study used two subtests from the Wechsler Memory Scale - 3rd Edition [5] to compare memory for faces and everyday social scenes in two groups of participants: those with WS and general developmental delay (DD).

Materials and Procedure

- Wechsler Memory Scale - 3rd Edition (WMS-III): Faces and Family Pictures Subtests
- Each subtest has an Immediate (I) and a Delayed (II) recall condition. The Delayed condition is administered 30 minutes after the Immediate condition.
- Faces I & II: participant is shown 24 photographs of faces one at a time. Subsequently, the participant is shown 48 faces one at a time and asked to respond ‘yes’ or ‘no’ to indicate whether or not they had seen the face in the earlier presentation (i.e. original 24 faces).
- Family Pictures I & II: participant views four different drawn scenes of four family members engaged in an activity. After viewing all four scenes, the participant is shown a blank card divided into four quadrants and asked to recall the scenes. In recalling each scene, participants must indicate who was in the scene, where they were located and what they were doing.
- A subtest (faces, family pictures) by time (immediate, delayed) by group (WS, DD) ANOVA revealed no significant main effect of time, nor any significant time interactions, suggesting that performance on immediate and delayed conditions were equivalent for both groups, in both subtests.

Methods

Participants

- WS group: diagnoses of WS had been established clinically and via FISH test (fourescent in situ hybridization) [6].
- DD group: consisted of individuals with developmental delays of unknown etiology.
- IQ was assessed using the Wechsler Adult Intelligence Scale - 3rd Edition [7].

WMS-III Subtest Key

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Between Group Comparisons

WMS-III: IMMEDIATE Recall

- The WS group performed significantly better than the DD group on the Faces Subtest (p < .05)
- There was no significant difference between WS and DD groups on the Family Pictures subtest (p > .05)

WMS-III: DELAYED Recall

- As in the immediate recall condition, the WS group performed significantly better than the DD group on the Faces Subtest (p < .05)
- As in the immediate recall condition, there was no significant difference between WS and DD groups on the Family Pictures subtest (p > .05)

Discussion

Results from the present study show that, in the WS group, memory for faces is better than would be expected given their level of non-verbal functioning, as indexed by PIQ. The strength in face memory emerged both as a between-group factor, with the WS performing better than the PIQ-matched DD group, as well as within a group strength relative to the Family Pictures task.

Of note is the fact that delay had no significant effect on performance on either task, in both groups, suggesting that successfully encoded information is stored and recalled after delay.

It is possible that the well-noted face processing strength in WS, coupled with a relative preservation of the ventral (‘what’) visual cortical stream facilitates better memory encoding of face stimuli in this group [8]. Thus, results from the present study suggest that the differences observed between groups originate at the level of encoding. Increased interest and attention to faces constitute a subset of the well-noted ‘hypersocial’ behaviors in WS [1]. It is possible that these behaviors subserve the face processing strength, which in turn facilitates better memory for faces in this syndrome.

References