

The Development of Facial Emotion Recognition in Williams Syndrome: Delayed and Interrupted

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Introduction

Concerning face processing, there is a debate :

- **people with WS do achieve a good level of performance by processing faces in a typical way,**
- **the normal range corresponds more to that of mental age-matched (MA) controls, with lower performance when compared to chronological age-matched (CA) controls**
- **people with WS do not process faces as normally developing people do**

Introduction

Another aspect of face processing has scarcely been studied: facial emotion recognition

Few studies investigated facial emotion recognition (Karmiloff-Smith, 1997; Deruelle et al., 1999; Gagliardi et al., 2003).

In the study by Deruelle et al. (1999), children with WS performed a facial emotion-matching task at the level of MA controls

Introduction

Gagliardi et al. (2003):

- patients aged between 5.6 to 32.3 year-old
- mental age varied from 4.3 to 11.5 years

"The performance of individuals with WS differed from that of CA controls but was indistinguishable from that of MA controls. This result may suggest that individuals with WS are functionally similar to their MA matched controls, and that performance of individual with WS on the expression task simply reflects delayed development" (pp. 736).

The study

Purpose:

We investigated the ability of adults with Williams Syndrome (WS) to recognize the emotion displayed by upright and upside-down faces

- ◆ To test further the hypotheses of
 - ◆ a delayed development of facial emotion recognition that ends at a level that corresponds to the mental-age of WS
 - ◆ no qualitative abnormalities in facial emotion processing
- ◆ By using a test already used with normally developing children by Durand et al (2007)

The study

Participants:

◆ Twelve adults with a clinical diagnosis of WS

- 6 females and 6 males
- Chronological age (CA): from 17 years 3 months to 39 years 2 months
(mean = 26 years 1 month, SD = 5 years 9 months)
- Mean mental age (MA): from 4 years 6 months to 9 years 6 months
(mean = 7 years 11 months, SD = 16.6 months)

◆ Twelve children

- (6 girls and 6 boys),
- CA: from 5 years 2 months to 9 years 8 months
(mean = 7 years 9 months; SD = 17.2)

◆ Twelve adults

- (6 females and 6 males)
- CA: from 20 years to 32 years 4 months
(mean = 24 years 4 months, SD = 4 years 5 months)

The study

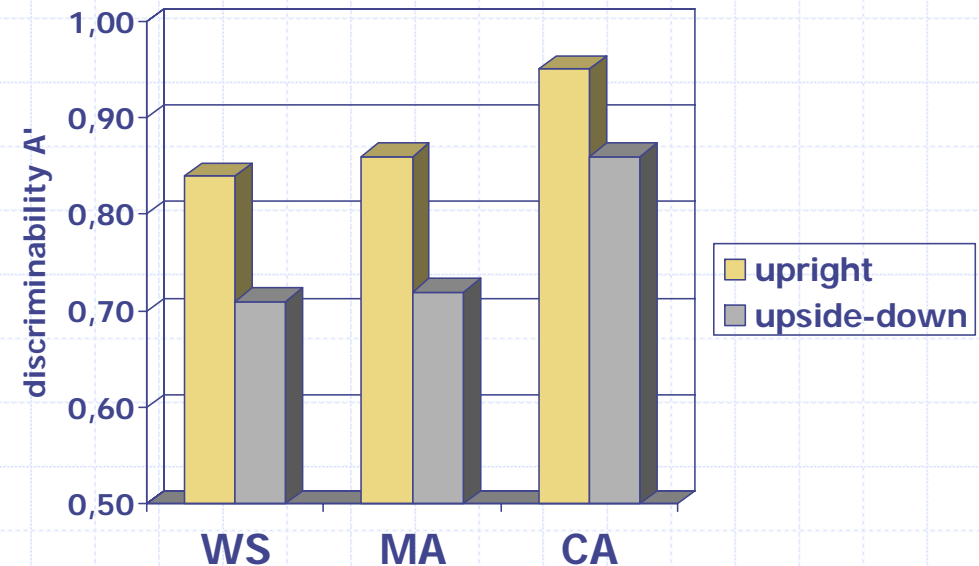
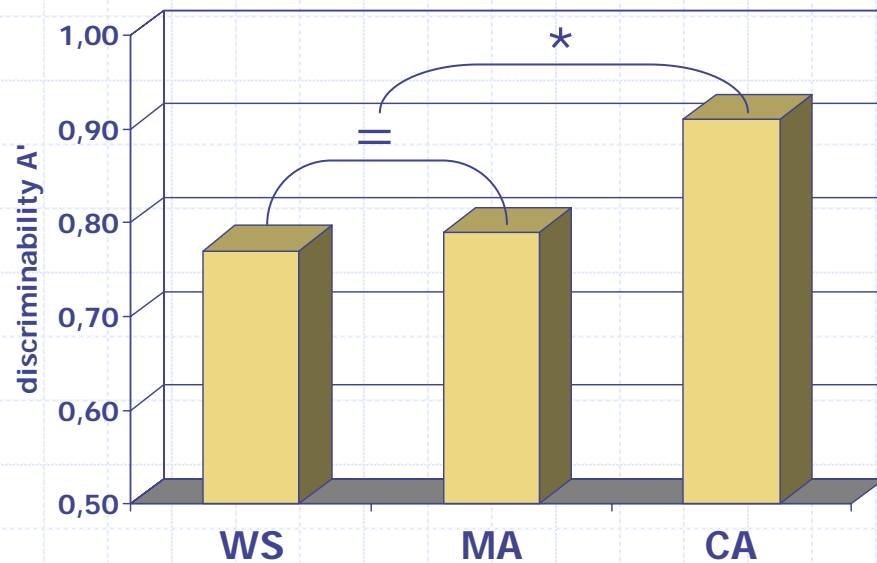
Procedure:

- ◆ Participants were told that they would see upright faces of different persons expressing various emotions.
- ◆ They were informed about the emotional categories and were given a sheet of paper with the name of each category followed by a sentence describing the emotional state.
- ◆ The participants were told to name the facial emotion depicted on each photograph.
- ◆ Materials: photographs of 36 persons from Durand et al. (2007), with 6 photographs for each of 6 facial emotions
 - ◆ anger, disgust, fear, happiness, sadness, neutrality

The study

Results: discriminability A'

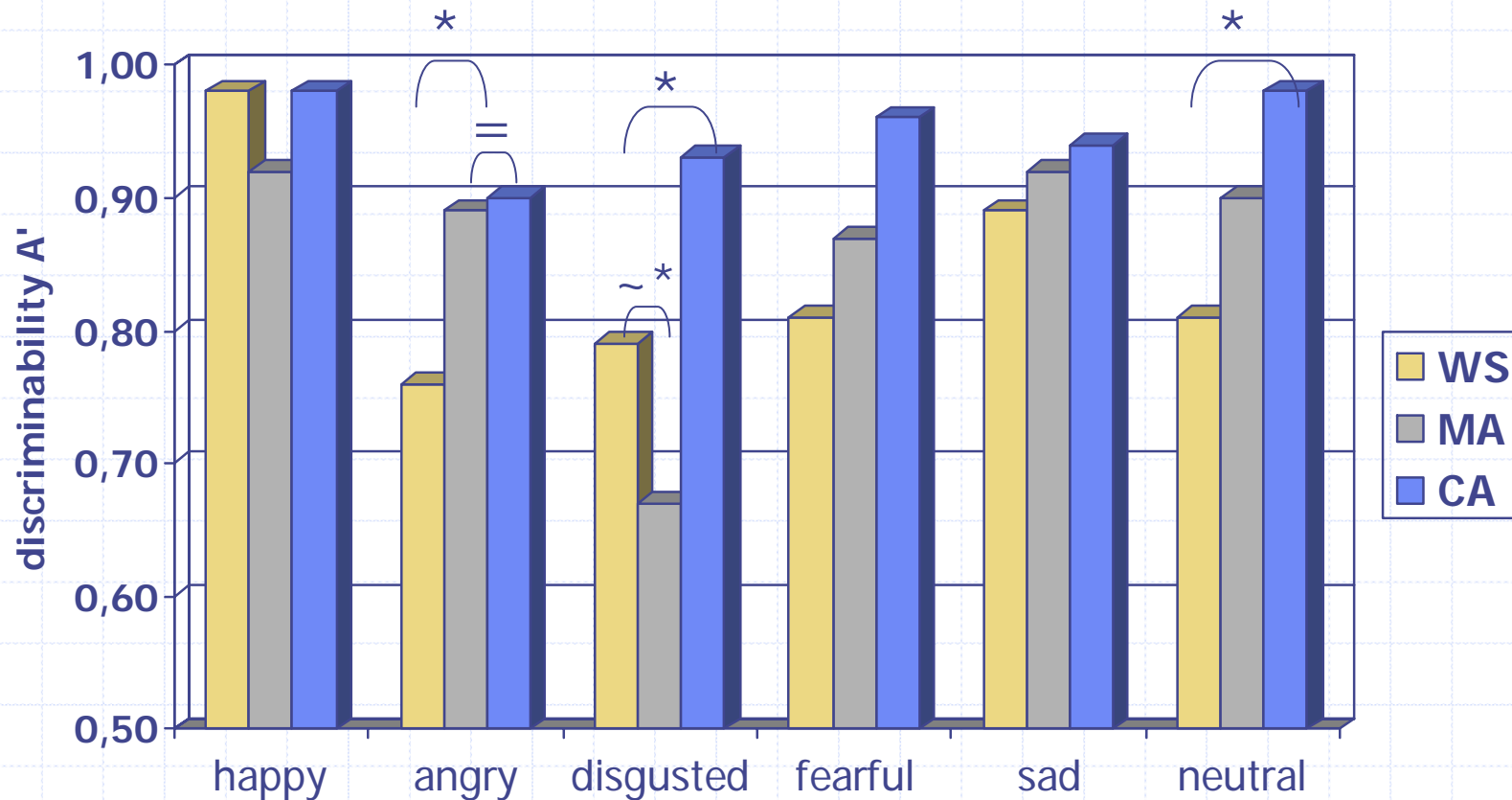
- ◆ Main effect of group
- ◆ No group x orientation interaction



The study

Results: discriminability A'

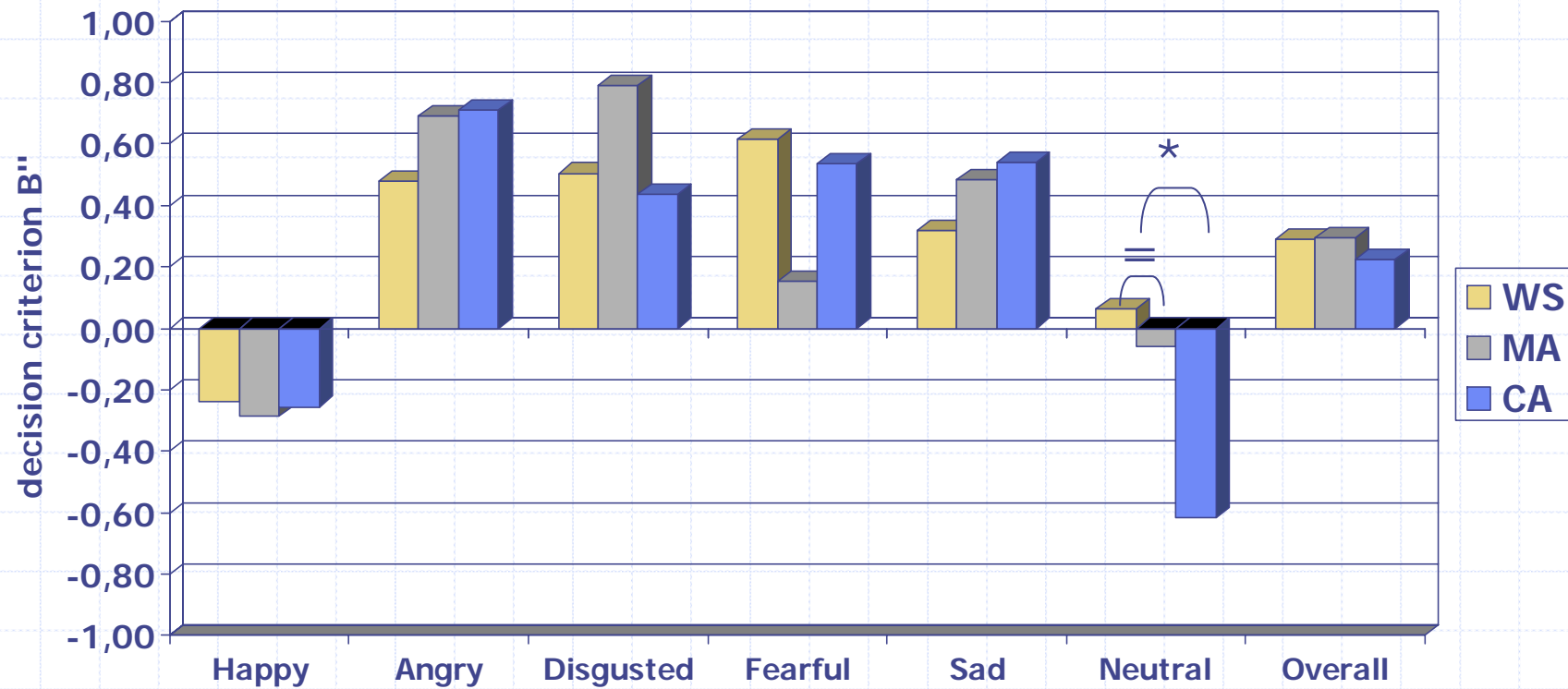
- discriminability for upright faces, by emotion



The study

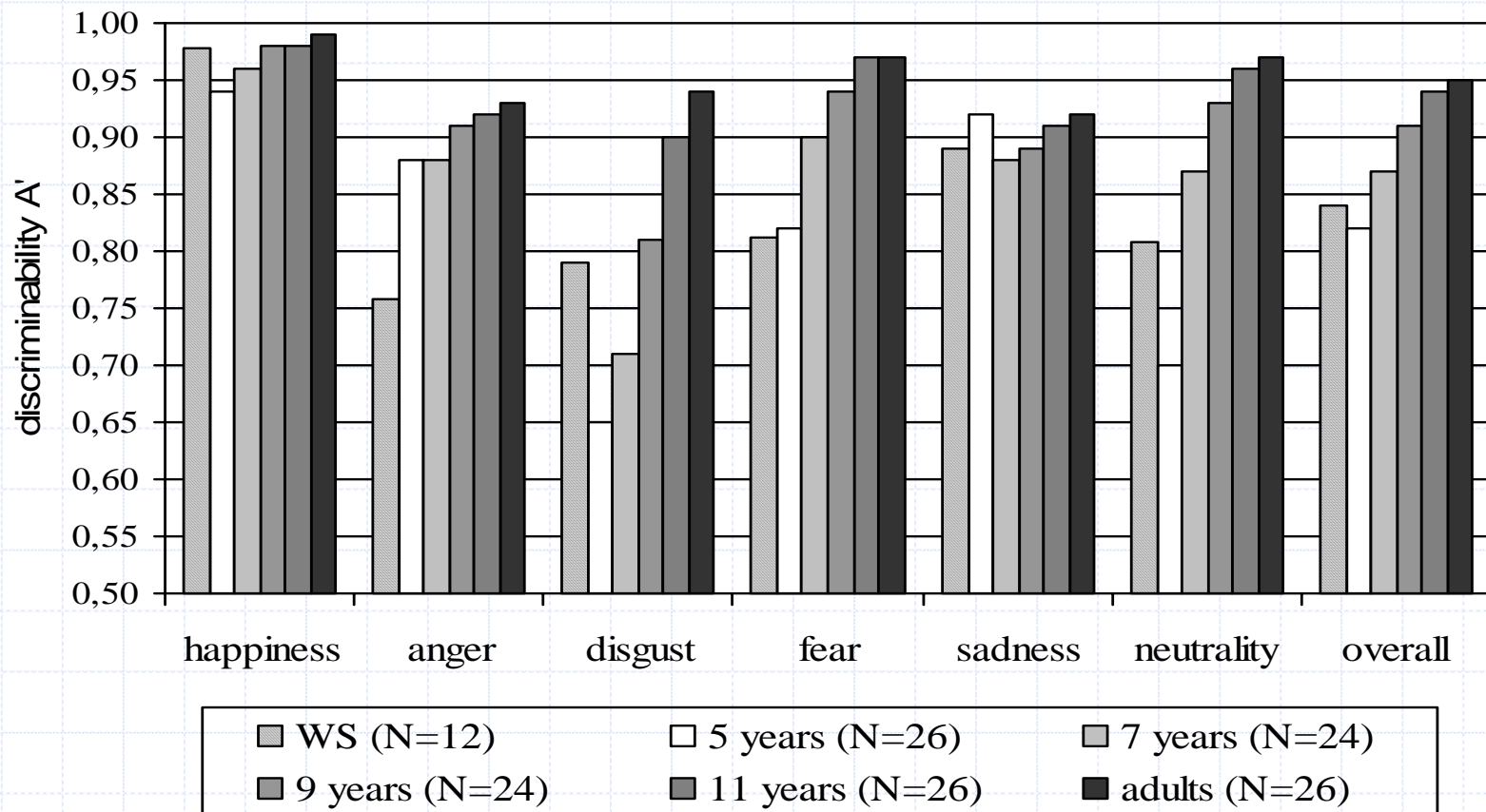
Results: decision criterion B''

◆ Interaction Group x Emotion



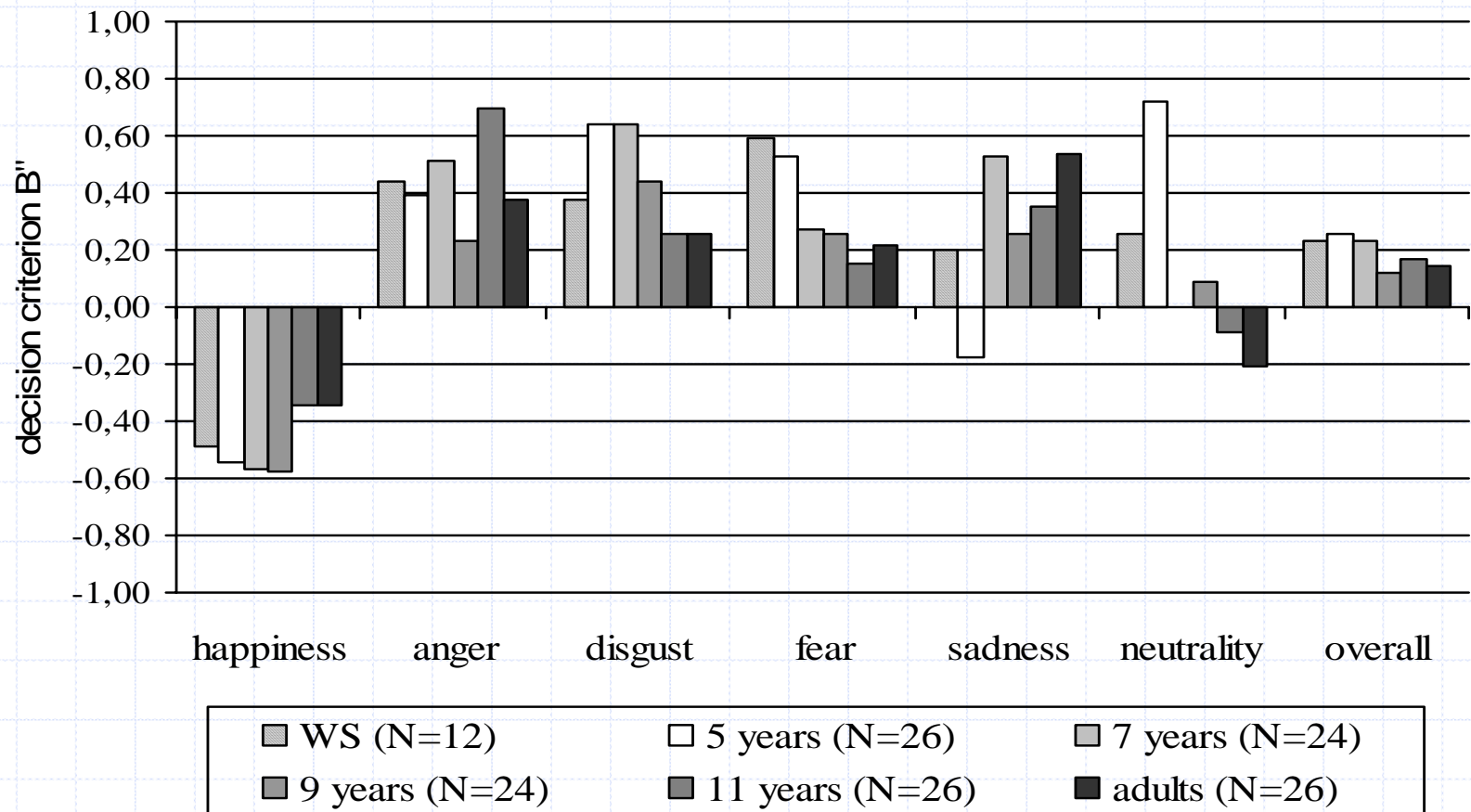
The study

Results: Comparison of WS discriminability A' for upright faces with the developmental curves reported by Durand et al. (2007)



The study

Results: Comparison of WS decision criterion B'' with the developmental curves reported by Durand et al. (2007)



Conclusions

- ◆ Overall, the ability of adults with WS corresponds to the ability expected according to their non-verbal mental age, i.e. it corresponds to the ability of children with equivalent level of non-verbal cognitive abilities
- ◆ There were, nonetheless, some slight discrepancies for the different emotions. This suggests that the development of the discriminability of emotions in adults with WS was heterogeneous
- ◆ With the exception of these slight discrepancies, no major peculiarity in the way people with WS process facial emotion emerged from our study, as in the study by Gagliardi et al. (2003)

Conclusions

In conclusion, adults with WS recognize facial emotion in the same way as children whose chronological age matches their non-verbal mental age. The development of this ability is not only delayed in these patients, but also ended at a level that is constrained by the level of development of their cognitive abilities