Introduction

Manual gestures are used to interact with the environment (e.g. pantomime of object use) or to communicate with other individuals (e.g. intransitive gestures such as “waving goodbye”). Individuals with high functioning autism spectrum disorder (ASD) are described as having normal cognitive functioning but difficulties in both social communication and praxis (i.e. execution of skilled manual gestures). This study aims at understanding whether:

1) difficulties are limited to intransitive gestures or extent to object related actions (i.e. pantomime);
2) gesture communication deficit is confined to gesture production or if ASD have difficulties also in gesture recognition.

Methods

Participants: Eighteen typically developing (TD) adolescents (Age Range = 12-18, M = 14.4 years, SD = 1.95) and 11 ASD individuals (Age Range: 10-16; M = 13.1 years, SD = 1.98).

Gesture production task: Participants had to perform the appropriate gesture with (i.e. pantomime) or without an object (i.e. intransitive gestures) under the presentation of a visual context (e.g. someone in front of a closed door: pantomime of the use of a key). Accuracy was taken into account.

Recognition task (Figure below): 96 videos of an actress performing meaningful and meaningless gestures (24 intransitives, 24 pantomimes, 48 meaningless. Randomly presented). Participants were asked to judge whether the gesture was familiar or not. Both accuracy and reaction time were registered.

In both the production and the recognition tasks, the facial expression of the characters was neutral.

Fixation (500 ms)

Video (4 s)

Response (∞)

Time

Description of the recognition task

Results

ASD participants showed lower performance on the production of intransitive gestures with respect to TD with a large effect size (Cohen’s $d = 1.05$). Furthermore, while TD participants were better on intransitive gestures (small to medium effect size, Cohen’s $d = .43$), ASD performance was equal in the two gesture types (Cohen’s $d = .14$).

In the recognition task, TD and ASD did not differ in terms of response time; concerning accuracy, in TD the performance increased for intransitive gestures with respect to pantomimes ($\eta^2_p = .41$), while in ASD participants the performance in the two gesture types did not differ.

Conclusion

Both the production and recognition of gestures were affected in ASD individuals. Such difficulty was driven by the intransitive (communicative) gestures.

Our results suggest that ASD are not slow in the processing of gestures, but rather unable to take advantage of the gesture social cue that would allow intransitive gesture recognition (and probably production).