

# Parent-Led Training for Motivating Eye Contact in Children with Autism Spectrum Disorder: BOSCC Outcome Study

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## Background

Difficulty in the use of eye contact is one of the earliest signs that evoke concerns in the parents of young children with autism spectrum disorder (ASD). It could be beneficial to aid a child with ASD to initiate eye contact by encouraging it in everyday situations considered the most rewarding for the child. We piloted a parent-led eye contact-specific training as an additional part of treatment as usual in young children with the prominent features of ASD and developmental delay. Our preliminary findings revealed that the use of eye contact increased in the training group measured in free-play sessions with the parent. The increase in the joint engagement was evident only in the training group after the 2-year follow-up. However, it is not known whether the increased use of eye contact is generalised to interaction with other persons than parents or to other aspects of social behaviour.

## Objectives

The aim of the study was to investigate whether a parent-led training method targeted to improve the use of eye contact in young children with ASD would show improvements in social interaction with other adults than parents.

## Methods

### Participants

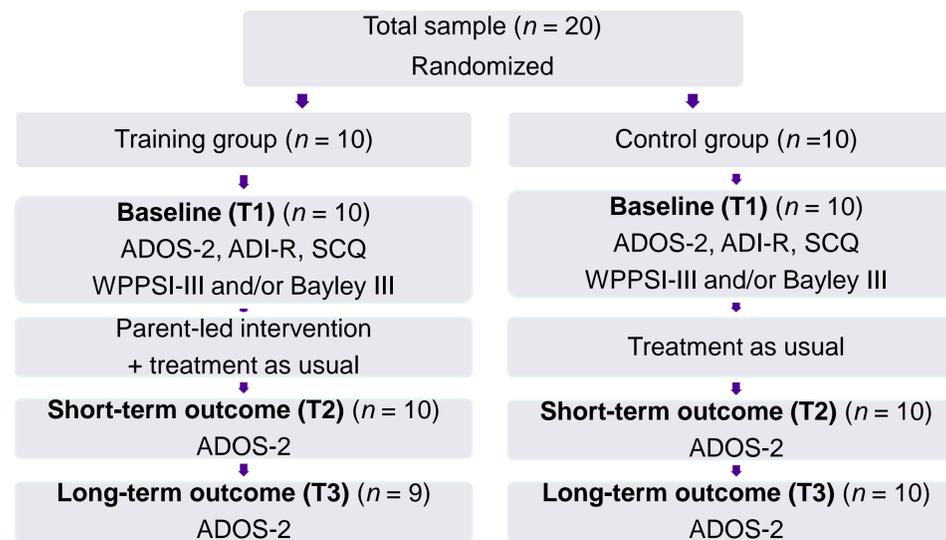
Twenty 2.5–5.5-year-old children with the prominent features of ASD and developmental delay were randomly divided into a training group and a control group (Table 1). The parents of the training group were taught to do three kinds of exercises in daily activities with their child for four months, while the control group received only treatment as usual (TAU).

	Training group (n = 10)	Control group (n = 10)
Gender (boys/girls) N	9/1	9/1
Chronological age M (SD)	4.09 (0.96)	4.16 (0.93)
IQ M (SD)	57.30 (14.44)	62.30 (14.86)
ADOS-2 comparison score M (SD)	7.60 (1.51)	8.00 (1.49)
ADI-R total score M (SD)	39.70 (9.83)	41.30 (7.06)

**Table 1.** Participant characteristics

## Design and primary measure (BOSCC)

The Brief Observation of Social Communication Change (BOSCC) was used as an outcome measure. The BOSCC analyses were done from ADOS-2 -assessments at the baseline (T1), 4–6-month short-term outcome (T2) and 2-year long-term outcome (T3) (Figure 1). The coders were blind to the status of the video and in good agreement with each other ( $ICC_{total} = .94$ ). Preliminary research version of the BOSCC consists of 16 items. Core score (items 1–13) reflects key autistic behaviours, which include 9 items of social communication (SC) and 4 items of restricted, repetitive behaviours (RRB). Total score includes core items and three items of other related abnormal behaviours. All items are coded with a 6-point scale (range 0–5) in which higher score indicates more atypical behaviour. The between-group differences were performed with Mann-Whitney U tests by comparing individual change scores,  $\Delta$  (delta) scores in every, three measurements points.



**Figure 1.** The intervention procedure

## Results

The findings showed that there were no significant differences between groups in delta scores in any of the summary scores at any measuring points ( $ps > .10$ ). At the item level, however, there was a significant difference in the change of eye contact in the short-term outcome in a way that the training group had improved more than the control group ( $U = 80.00, p = .023, r = .52$ ).

In the short-term outcome there were greater improvement in the use of gestures ( $U = 75.50, p = .052, r = .44$ ) and in the integration of vocal to non-vocal modes of communication ( $U = 82.50, p = .011, r = .56$ ) in control group than in the training group. In the long-term outcome there were greater improvement in the use of gestures ( $U = 77.50, p = .006, r = .62$ ) and in the integration of vocal to non-vocal modes of communication ( $U = 76.50, p = .008, r = .61$ ) in training group than in the control group (Table 2).

	T1 (n = 20)	T2 (n = 20)	T3 (n = 19)	Significant difference in delta scores <sup>a</sup>
Eye contact M (SD)				$\Delta T2-T1 _{training} > \Delta T2-T1 _{control}^*$
Training group	2.90 (0.57)	2.45 (0.50)	2.61 (0.96)	
Control group	2.65 (0.63)	3.05 (0.93)	2.70 (1.11)	
Gestures M (SD)				$\Delta T2-T1 _{control} > \Delta T2-T1 _{training}^*$ $\Delta T3-T2 _{training} > \Delta T3-T2 _{control}^{**}$
Training group	2.75 (1.11)	3.40 (1.17)	2.00 (0.87)	
Control group	3.10 (1.10)	2.40 (0.99)	2.70 (1.34)	
Integration of vocal and non-vocal M (SD)				$\Delta T2-T1 _{control} > \Delta T2-T1 _{training}^*$ $\Delta T3-T2 _{training} > \Delta T3-T2 _{control}^{**}$
Training group	3.65 (0.94)	4.00 (0.67)	2.83 (0.61)	
Control group	3.65 (1.08)	3.00 (0.94)	2.85 (0.94)	

<sup>a</sup> Mann-Whitney U

\*\* $p < .01$ , \* $p < .05$ , (\* $p < .10$ )

**Table 2.** Means, standard deviations and statistically significant differences in delta scores between training and control groups of three social interaction subcategories

## Conclusions

Our preliminary findings indicate that the parent-led eye contact training increased the use of eye contact in pre-school aged children with ASD and most importantly, showed generalisation in the semi-structured play session with a stranger adult. Interestingly, the training of eye contact seemed to somewhat alter the course of development as shown in the different phase of the development in other aspects of communication (gestures, integration of vocal and non-vocal communication) between the control and training group.