# Parent-Led Training for Motivating Eye Contact in Young, Low-Functioning Children with Autism

Muuvila M. [1], Helminen T.M.[2], Eriksson, K.[3], Charman, T.[4] & Kylliäinen, A[2].

1. Tampere University Hospital, Finland, 2. Human Information Processing Laboratory, University of Tampere, Finland, 3. Tampere Center for Child Health Research, University of Tampere and Department of Pediatric Neurology, Tampere University Hospital, Finland, 3. King's College London, Institute of Psychiatry, Psychology and Neuroscience, London, United Kingdom.

## Background

- Difficulties in eye contact are widely reported in children with autism spectrum disorder (ASD).
- To reduce further abnormalities in social development it seems important to motivate them to look towards other people's eyes as early as possible.
- In enhancing early social-communicative skills (e.g., eye contact), behavioral and developmental interventions have shown to be most effective.
- Involving parents in interventions of early social communication skills has been shown to reduce autistic behavior and improve parent-child interaction.
- **The aim of this study** was to teach parents to motivate their child with ASD to use eye contact in addition to treatment as usual, and to find out whether this kind of intervention is connected to changes in eye contact and the state of engagement in short- and long-term.

## Methods

### *Participants*

- Twenty young, low-functioning children with clear ASD were randomly divided to an intervention group and a control group (Table 1).

**Table 1.** Descriptive statistics of the participants (mean & range).

| Group | N (girls) | Age | IQ | ADI-R (Social/Comm./RRB) | ADOS-2 |
|---|---|---|---|---|---|
| Intervention | 10 (1) | 4,1 (2,5-5,5) | 57,3 (42-84) | 21,1 (6-27)/ 12,2 (7-20)/ 6,0 (3-12) | 7,6 (6-10) |
| Control | 10 (1) | 4,2 (2,5-5,4) | 62,3 (47-88) | 21,1 (12-28)/ 12,8 (8-15)/ 7,4 (4-12) | 8,0 (6-10) |

### *Intervention method*

- Parents were taught to do three kinds of daily activities with their child for 4 months. The activities included encouraging the child to use eye contact for requesting food, toys or physical play activity, and imitating the child's actions in a specific manner.
- Behavioral and developmental principles (e.g. natural activities and natural reinforcement) were used focusing on positive affect.

### *Measurements*

- There were **baseline, short-term** (4-6 months after baseline) **and long-term** (two years after baseline) **assessments** in both groups.
- The outcome measures included observations (in the laboratory, at home and in the day care), questionnaires and psychophysiological measures. Findings from parent-child play observations in laboratory are presented here.
- The parent-child free play session (10min) was conducted in the laboratory with given toys.

### *Analyses*

- The analyses were made using ELAN annotation program by observers, who were blind to the assessment time and group allocation.
- The observers analysed child's orientations toward the parent's face (indicative of eye contact) and the state of engagement.
- In addition to the number of eye contacts, the observers analysed whether the eye contact was initiative or responsive, and whether it was linked to other forms of social communication (e.g., gestures and vocalization).
- The state of engagement was analysed by modified version of coding system by Adamson et al., 2004. **IN category** comprised of supported and coordinated joint engagement in contrast to **OUT category** which combines periods of object engagement and unengaged.

## Results

- The results showed that in the short-term outcome **eye contacts** in total (p = .024), and especially responsive eye contacts (p = .009) increased in the intervention group. There was also an increase in eye contacts that were connected to other forms of social communication (p = .012). The increase from baseline in total eye contacts (p = .017), and especially in responsive eye contacts (p = .017) was still evident in the long-term outcome. In the control group the increases of eye contacts were not significant (Table 2).

**Table 2.** *Eye contacts at baseline, short- and long-term outcomes. The significance of outcomes is analysed in relation to baseline, * p < .05; ** p < .01.*

| **Intervention group** | | | |
|---|---|---|---|
| **Eye contacts** | **Baseline** | **Short-term outcome** | **Long-term outcome** |
| Initiative | 2,0 (0-5) | 2,7 (0-12) | 5,1 (0-20) |
| Responsive | 0,9 (0-3) | 5,0 (0-13) ** | 10,4 (0-30) * |
| **Total** | **3,0 (1-5)** | **7,7 (1-16) *** | **15,6 (0-46) *** |
| Connection to communication | 1,7 (0-5) | 4,4 (1-10)* | 5,2 (0-12) |
| **Control group** | | | |
| Initiative | 2,0 (0-5) | 2,6 (0-10) | 4,8 (0-15) |
| Responsive | 4,9 (0-17) | 8,5 (0-24) | 11,7 (0-63) |
| **Total** | **6,9 (0-21)** | **11,1 (1-34)** | **16,5 (0-77)** |
| Connection to communication | 4,9 (0-19) | 8,1 (0-29) | 6,9 (0-26) |

- In the **state of engagement** there was no significant changes in the short-term outcome. In the long-term outcome, however, IN engagement in the intervention group (p = .028), but not in the control group, increased significantly (Figure 1).

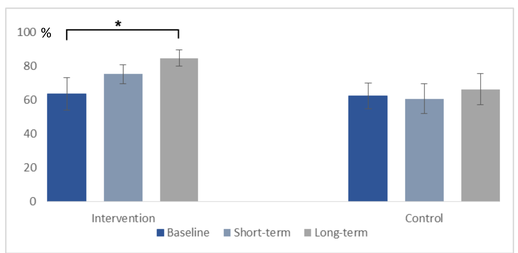


**Figure 1.** *Mean percentages (S.E.M.) of IN engagement during parent-child play at baseline, short- and long-term outcomes in both groups, * p < .05.*

## Discussion

- The study showed that it was possible to teach the proposed motivating activities to parents and they were in general able to conduct them daily or weekly.
- This parent-led eye contact focused training seemed to improve the use of eye contact and, importantly, also the state of engagement in the long run.
- This study strengthens the findings that it seems beneficial to encourage the use of eye contact in young, low-functioning children with ASD in their daily lives.

Mari.Muuvila@gmail.com

Human Information Processing Laboratory – University of Tampere