

Can Joint Attention Skills be Measured Reliably? Effect Study of Dutch JASPER-Training

M. E. Buruma, MSc, & E.M.A. Blijd-Hoogewys, MSc, PhD

INTER-PSY 

m.buruma@inter-psy.nl

Background

Infants with autism spectrum disorders (ASD) have problems with social interaction, communication and play (Zwaigenbaum et al., 2013). **Early intervention** can lead to better long-term outcomes (Dawson et al., 2010). Early stimulation of joint attention (JA) skills, in particular, is associated with better language, communication and social outcomes (Warreyn et al., 2014; White et al., 2011).

The **JASPER training** (Kasari et al., 2006, 2013) focuses on Joint Attention Symbolic Play Engagement and Regulation in young children. It is a naturalistic behavioral intervention focused on the development of prelinguistic gestures (JA, requesting) and play skills within the context of play based interactions as a means to increase joint engagement between an adult and child with ASD. In the **Netherlands**, the JASPER training is exclusively parent-mediated. During play sessions, parents are actively coached to use strategies for setting up a learning environment, modeling and prompting for JA, expanding play, and using developmentally appropriate language (Kasari et al., 2014; Chang et al., 2016).

Objectives

- 1) Is the Dutch version of the JASPER training effective in infants with ASD?
- 2) Can we develop an observation standard to reliably assess JA amelioration?

Methods

This research was conducted in a clinical setting: the Infant team of INTER-PSY.

Infants with ASD, developmental delays and limited spoken language (2-4 years old, ADOS-2, BSID-II-NL) participated in the JASPER training. There were 15 weekly sessions: **10 play sessions** (30-45 minutes, with child & parent(s)) and 5 evaluation sessions (60 minutes, with parent(s) only). All JASPER play sessions were videotaped and later used during the evaluation sessions with parents.

There were **two control groups**: a clinical non-JASPER group (infants with ASD who did not receive the JASPER training) and a typically developing group (TD).



Pre- and post-treatment, parents filled in the **ESCBQ** (Early Social Communicative Behavior Questionnaire) and the **PICS** (Pictorial Infant Communication Scale), as measurements for JA and other early social communicative behaviors.

You can obtain the poster content via the above QR code.

Preliminary results

Study 1: The JASPER group (n = 4) showed significantly **improvement** in specific JA skills at **post-treatment**, in comparison with the clinical non-JASPER group, as measured by 4 **ESCBQ subscales** (Mann Whitney: $z(-2.081)$, $z(-1.875)$, $z(-1.979)$, $z(-1.732)$; $p < .05$; eye contact, emotion, gaze following and showing respectively) and all 3 **PICS subscales** (Mann Whitney: $z(-1.955)$, $z(-1.949)$, $z(-2.453)$; $p < .05$; initiating JA, initiating behavior request, and responding to JA respectively). Though, their skills are still at a significant lower level than that of the TD control group (ESCBQ total score; $z(-1.874)$, $p < .05$; no data available concerning BICS). The data collection is ongoing (n = 20 have been collected).

In order to capture the amelioration of early social communicative behaviors over time, a **qualitative coding system** needed to be developed. Originally, 63 categories (31 child, 21 parent & 11 language categories) were formulated in MediaCoder, based on literature study and clinical experience. Up till now, 4 studies (Study 2-5) aimed at coding the videotaped play session behaviors have been conducted by graduate psychology students.

Study 2 (Wonink, 2015): full 5 (out of 10) JASPER play sessions (30-45 minutes) of 1 child were coded. The statistical analyzes proved multiple categories to be unreliable, difficult to operationalize; there was **low inter-rater reliability** (IRR; 2 student raters, Cohen's Kappa: .24-.86) and **high inter- and intra-variability**. Advise was to reduce the amount of categories (also 21 out of 63 categories were never used).

Study 3 (Norden, 2015): part of 10 JASPER play sessions (20 minutes: 10:00-30.00) of 2 children (incl. the child from Study 2) were coded. The qualitative coding system was reduced to 19 categories (16 child & 3 parent categories). Again IRR was low (1 student + 1 therapist rater, Cohen's Kappa = .16-.84), also there was high inter- and intra-individual JA skills. Some trends were found, but no significant amelioration.

Study 4 (Zwama, 2016): full 10 JASPER play sessions (30-45 minutes) of 2 new children were coded. The qualitative coding system was adjusted to 18 categories, with **more emphasis on parent behavior** (8 child & 10 parent categories). Again **inter-rater reliability** was low for child categories, though **better for parent categories** (2 student raters, Cohen's Kappa = .01-.36 vs. .14-.80, respectively). Again high inter- and intra-individual variability was found (see Figure 1). **Significant results were found over time** (MC-analysis): more response to appeal and more responsive JA (child 3: slope = .07, $p = .04$; slope = .19, $p = .02$), less requesting and less instrumental use of other's body to communicate (child 3 & 4: slope = -.54 vs. $p = .03$; slope = -.38, $p = .01$; slope = -.17, $p = .03$).

Study 5 (Sikkenga, 2016): same data as in Study 4 were used. The qualitative coding system was adjusted to 19 categories, with **more emphasis on language skills** (10 child, 2 parent & 7 language categories). CHILDES CHAT was used to transcribe the vocalizations. **Inter-rater reliability** was again low for child categories, though **better for parent categories** (Cohen's Kappa = .10-.36 vs. .25-.80, respectively) and for **language categories** (77%). **Significant results were found over time** (MC-analysis): less babbling (child 3: slope = -4.91, $p = .08$), more single words and more 2-word-sentences (see Figure 2; child 4: slope = 3.39, $p = .01$; slope = 1.86, $p = .02$); MLU is unchanged. Directed speech was correlated with initiating JA in both children ($r = .65$, $p = .005$; $r = .54$, $p = .0002$), with responsive JA only in 1 child (child 4: $r = .40$, $p = .007$).

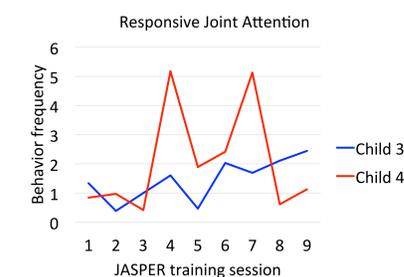


Figure 1 Responsive JA skills over JASPER training sessions

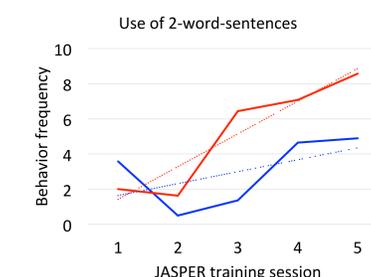


Figure 2 Use of 2-word sentences over JASPER training sessions

Conclusions

Using the Dutch version of JASPER, **preliminary results** (Study 1, n=4) show that specific JA skills have ameliorated at post-treatment (ESCBQ: eye contact, emotion, gaze following & showing respectively; PICS: initiating JA, initiating behavior request & responding to JA). When repeated measurements are taken into account: **amelioration in responsive JA** - not in initiating JA - is found (Study 4, n=2, 10 RM). Also **amelioration in language skills** are found. Directed speech is correlated with JA, mainly initiating JA (Study 5).

We have found it **difficult to measure JA improvement reliably using a qualitative coding system**, in contrast to measuring more broad early social communicative behavior (such as language). All 4 qualitative coding system variants have low inter-rater reliability (Study 2-5), parent and language categories appear to be somewhat better (Study 4 & 5). There is also high inter- and intra individual variability. Further research is needed, also taking into account other outcome measurements.