Improving Joint Attention of Children with Autism Spectrum Disorder: A Randomized Controlled Trial of a Parent-Mediated Intervention

Irina E. Poslawsky, Fabiënne B.A. Naber, Emma van Daalen, Herman van Engeland, Marinus H. van IJzendoorn; Marian J. Bakermans-Kranenburg

Abstract

We studied the effectiveness of the parent-mediated intervention program Video feedback Intervention to promote Positive Parenting adapted to Autism (VIPP-AUTI) on children’s joint attention and play. VIPP-AUTI is a short-term home training with demonstrated effectiveness on parent sensitivity. Currently, we tested the effects of VIPP-AUTI on children’s joint attention and play behavior in a randomized controlled trial with a sample of 78 children and their primary caregivers. Results demonstrated that VIPP-AUTI, as compared with usual home training, increased children’s initiating joint attention behavior. No intervention effects were found on children’s responding to joint attention and their play behavior. The positive effect on children’s initiating joint attention skills supports the use of VIPP-AUTI in families of young children with ASD.

Introduction

Parent training aimed at enhancing the quality of parent-child interaction might be effective in decreasing symptomatology in children with Autism Spectrum Disorder (ASD), in particular with respect to their communication and socio-emotional development. In a randomized controlled trial, we demonstrated the effectiveness of a parent-mediated intervention program (VIPP-AUTI) in enhancing parental sensitive responsiveness toward their child with ASD. The intervention program reduced parents’ intrusiveness (promoting reciprocal interaction with respect to their child’s autonomy) and enhanced their feelings of efficacy in child rearing (Poslawsky et al., under review; see chapter 4). In the current study, we tested intervention effects on joint attention and play behavior in young children with ASD.

ASD is a neurodevelopmental disorder characterized by social and communication deficits, combined with repetitive or restricted behaviors and interests with an onset before 36 months of age (American Psychiatric Association [APA], 2013). One of the core deficits in young children with ASD is absent or limited joint attention (Lord et al. 2000; Luyster et al. 2007). Joint attention refers to a child’s dyadic or triadic relation between self, other and object (Bakeman & Adamson, 1984; Leekam et al., 2000) and is related to prelinguistic social development (e.g. Charman, 2003; Dawson et al., 2004) as part of the neurological maturation rooted in earliest infancy (Mundy et al., 2009).
Neurological development is sensitive to environmental influences. Children with ASD were found to benefit from early intervention targeting at improvement of joint attention skills (Patten & Watson, 2011), and joint attention skills have been found associated with the quality of parent-child interaction (Bruinsma et al. 2004; Kasari et al. 2010; Claussen et al. 2002; Siller & Sigman, 2002). Two types of joint attention are distinguished: (1) responding to joint attention (RJA); and (2) initiating joint attention (IJA). RJA is defined as the child’s ability to follow and share another person’s visual attention leads (e.g. gazing, pointing, etc.). IJA refers to the child’s ability to create or indicate spontaneously another person’s visual attention to share (e.g. Mundy et al., 2009). The level of joint attention of children with ASD is associated with their quality of play behavior (Charman, 1997) and with caregivers’ sensitive responsiveness to the child during play interaction (sharing children’s toy-directed attention in an undemanding and continuing way) (Siller & Sigman, 2002).

Play behavior reflects many developmental aspects of children, such as cognitive, linguistic, emotional and social development (Jordan, 2003) and is also influenced by the quality of parent-child interaction (Marcu et al., 2009; Naber et al., 2008). During the first two years of life, play development can be divided into the following stages: (1) simple object manipulation; (2) relational, non-functional play with two or more objects; (3) functional (conventional) play; and (4) symbolic (make-believe or pretend) play (Ungerer & Sigman, 1981). When children play with objects they intend playful engagement, sensorimotor exploration and symbolic functions through physical interaction with materials (Baranek et al., 2005). Social play refers to interactive play with other persons (Luckett et al., 2007). Infants with ASD showed atypical play development (Jarrold et al., 1993; Jarrold et al., 1996; Rutherford & Rogers, 2003), corresponding with deviations in their use of toys or being stuck in restricted interests (Ungerer & Sigman, 1981; Van Berckelaer-Onnes, 2003; Wulff, 1985; Williams, 2003).

In the current study, we investigated joint attention and play behavior of children with ASD after families received Video feedback Intervention to promote Positive Parenting adapted to Autism (VIPP-AUTI: Poslawsky et al., under review; see chapter 3) or care as usual. Although the intervention was not aimed at the children, but at their parents, we examine the effects of VIPP-AUTI on the children. We hypothesize that after parents received VIPP-AUTI, joint attention and play skills of children with ASD would improve via enhanced quality of parent-child interaction. Improvements of children’s joint attention and play skills may be mediated by
increased parental sensitive responsiveness. We assessed parental sensitive responsiveness before and after the intervention using the Emotionally Availability Scales (EAS; Biringen et al., 2000) with the subscales for sensitivity, structuring and non-intrusiveness, and found increased non-intrusiveness in parents who received the VIPP-AUTI intervention (Poslawsky et al., under review; see chapter 4). We expected to find positive effects of VIPP-AUTI on child-outcomes at the follow-up assessment (but not at the immediate post-test), based on findings in previous VIPP-related intervention studies (Bakermans-Kranenburg, et al., 2008; Klein Velderman et al., 2006) which show that changes in parental attitude and behavior may need some time to settle to stimulate observable changes in the child’s behavior.

**Method**

The VIPP-AUTI study is a collaboration project between University Medical Center Utrecht (Department of Psychiatry) and Leiden University (Center for Child and Family Studies). As part of a single blind randomized controlled trial, in which parental sensitive responsiveness to children with ASD improved after receiving VIPP-AUTI (Poslawsky et al., under review; see chapter 4), we tested for therapeutic effects of VIPP-AUTI on joint attention and play skills of children with ASD.

**Participants**

Seventy-eight children with ASD (86% boys) and their primary caregivers (90% mothers) participated in this study. Children’s age ranged from 16 to 61 months ($M = 43.0$, $SD = 10.0$). Children’s developmental level ranged from mental retardation to above average functioning (range 49-124, $M = 73.7$, $SD = 22.0$). Age equivalent of children’s language development was 32 months on average ($M$ language comprehension = 32.8, $SD = 17.1$ and $M$ language production = 32.1, $SD = 16.1$). In 53% of the sample, the gap between the child’s chronological age and age equivalent of language development was more than 6 months. Twelve percent of the children were raised bilingually. More than half of the children were first born (59%). Parental age ranged from 25 to 52 years ($M = 36.6$, $SD = 5.0$) and the majority of parents were Dutch (90%) and married (82%). The social economic status of the participating families was medium on average ($M = 0.97$, $SD = 0.84$ on a scale ranging from -1.84 to 2.23).
**Diagnosis**

Children were diagnosed as having ASD by a board-certified child psychiatrist according to extensive developmental history, all medical files, a semi structured observation (Autism Diagnostic Observation Schedule – Generic) and classification of the Diagnostic and Statistical Manual of Mental Disorders 4\textsuperscript{th} Edition-Text Revision (DSM-IV-TR; APA, 2000). Of the children, 68\% were diagnosed with Autistic Disorder (AD), and 32\% were diagnosed with Pervasive Developmental Disorder (PDD-NOS). The majority of the children received ASD (with or without comorbid mental retardation) as the first and only diagnosis. In addition to the ASD diagnosis, some children (36\%) received a diagnosis or a combination of diagnoses regarding somatic conditions; lung diseases (21\%), sensory deficits (12\% auditory and 6\% visually problems), epilepsy (6\%), growth disorder (4\%), congenital heart muscles disease (3\%), or metabolic disease (1\%).

**Procedure**

Newly ASD-diagnosed children under the age of five years and their primary caregivers were invited to participate in this intervention study at the university hospital. The inclusion period was from June 2008 to April 2012 (see Figure 1). After baseline assessments, participants were randomly divided into the experimental group (VIPP-AUTI) or control group (Care as Usual; CU). Randomization by computer generated tables was done by a staff manager who was not involved in the research project. Since both groups received home visits, families were not aware whether they received the experimental intervention or care as usual. Before randomization, at post-test, and after a no-treatment 3-month follow-up period, children’s joint attention was assessed at the university hospital and children’s play behavior was observed at home. At the same time points, parents were asked to complete questionnaires, including assessments of the child’s challenging behavior, because of its possible impact on parent-child interaction.

Demographic data were administered prior to the study during the diagnostic phase. The study protocol was approved by the ethics committee of the University Medical Center Utrecht. Both parents gave written informed consent before participation.
Figure 1  Flow chart of inclusion

Care-as-Usual (CU)
All participants were offered usual care after receiving the child’s ASD-diagnosis, including parental group meetings of psycho-education about ASD in general, pharmacological treatment when indicated or support from external care providers. Participants in the CU group received usual nursing home training consisting of five visits on average over a period of at most six months. The care, based on behavioral and family therapeutic interventions, was meant to support the parents and it focused on practical issues of parenting a child with ASD.
Experimental Group (VIPP-AUTI)
VIPP-AUTI was provided during three months, consisting of five home visits of 60-90 minutes each at a two-weekly interval (Poslawsky et al., under review; see chapter 3). As part of the VIPP-AUTI program, child and parent were videotaped in daily situations, particularly when they were playing together and during mealtimes. The intervener did not interfere during filming to ensure that a natural parent-child interaction was observed, including the child’s entire behavioral repertoire. During each home visit, the previously filmed fragments of the individual parent-child interactions were discussed with the parent according to the intervention protocol. Each session was devoted to a theme regarding the quality of interaction related to observable ASD-characteristics, e.g. play behavior, joint attention, daily routines and stereotypical behavior. The autistic traits and the unique behavior of the child were highlighted, mirroring positive parent-child interaction patterns. The partners of the primary caregivers were invited to join the video feedback at the fifth home visit (a booster session). VIPP-AUTI was performed by comprehensively trained nurses, using a detailed manual and with intensive monitoring of therapy fidelity (by IU, FN, MB-K, MvIJ).

Measures

*Autism diagnostic observation schedule - generic (ADOS – G)*

The ADOS-G (Lord et al., 2000) quantifies deficits across the autism spectrum, controlling for effects of language and cognitive delay, in individuals with significant impairments. ADOS-G total score is the cumulative score of five test domains: communication, social reciprocity, play, stereotypic behavior and other problems. Higher ADOS-G total scores refer to more severe autistic symptoms. The ADOS-G consists of four modules. In the current study, children were assessed using module 1 (n = 42) and module 2 (n = 36), based on their level of expressive language. The child psychiatrist, who was certified for ADOS-reliability, administered the ADOS-G during the diagnostic phase prior to the study.

*Mullen scales of early learning (MSEL)*

The MSEL (Mullen, 1995) is a standardized developmental test that yields a mental age score for children between 3 and 68 months of age. The MSEL assesses five domains, one measuring cross motor skills (not used in the current study), and four cognitive domains: (1) visual
reception, (2) fine motor skills, (3) receptive language, and (4) expressive language. The early learning composite standard score is a combination of non-verbal (domain 1 and 2) and verbal composites (domain 3 and 4), which ranges from low (<70) to high cognitive functioning (>70). The test was administered by a certified clinical psychologist at pretest.

Language development

The Reynell test for Dutch language comprehension (Van Eldik et al., 1995) and the Schlichting test for Dutch language production (Schlichting et al., 1995) were administered individually by a certified psychologist or speech language therapist at pretest and follow-up. The Reynell and Schlichting tests evaluate receptive and expressive language, respectively, for children between 14 and 75 months of age. If children were not able to do these tests (n = 26), the assistants collected parental reports using the Dutch version of the MacArthur-Bates Communicative Developmental Inventories (CDIs; Fenson, 1993; Fenson et al., 2007; N-CDIs; Zink & Lejaegere, 2002; Zink & Lejaegere, 2007) (n = 22). The CDIs consist of three forms, corresponding with different age groups; (1) ‘Word and Gestures’ (8-16 months of age), (2) ‘Word and Sentences’ (16-30 months of age) and (3) ‘CDI-level III’ (30-37 months of age), assessing vocabulary comprehension and production. The inventories were also used for children beyond the specified age ranges when they had impaired language development (Fenson et al., 1994). The validity of the measure has been shown in children with and without language delay (Heilmann et al., 2005), and for children with autism (Charman et al. 2003; Luyster et al., 2007).

In the current study, language development score was based on the converted age equivalents of total language comprehension scores of the Reynell or N-CDI, and total word-production scores of the Schlichting or N-CDI.

Aberrant behavior checklist (ABC)

The ABC (Aman et al., 1985) is a parent report questionnaire to assess children’s atypical and challenging behavior. The ABC contains 58 items scored on a Likert scale with 0 = not true, 1 = somewhat or sometimes true, 2 = regularly true and 3 = very (often) true. The ABC comprises five factors: (1) irritability, agitation, crying; (2) lethargy, social withdrawal; (3) stereotypic behavior; (4) hyperactivity, noncompliance; (5) inappropriate speech. The ABC was reported to
be adequate for assessing the severity of autistic behaviors in early childhood (Karabekiroglu & Aman, 2009). In this sample, internal consistency of the scale (Chronbach’s alpha) was .94.

*Socio-economic status (SES)*

SES was based on status scores 2010 of postal areas. Status scores were derived from level of education, employment and income per postal area by The Netherlands Institute for Social Research (SCP, 2010). Higher status scores refer to higher SES.

*Early social and communication scales (ESCS)*

The ESCS (Mundy et al., 2003) scores are based on videotaped semi-structured interaction to measure joint attention. Joint attention behaviors, behavioral requests and social interaction behaviors are evoked by different types of play tasks initiated by the experimenter. The assessment was performed according to protocol. The child was seated opposite to the investigator at a small table. The experimenter presented the child with an array of novel toys. The toys included three small wind-up toys, three hand operated toys including a balloon, a small car, a ball, a picture book, a comb, cap and glasses. Posters were positioned on the walls to the left, right and behind the child. Throughout the session, only one toy at a time was presented to the child. The original scoring methods as described in the manual were followed with lower scores for lower level joint attention behavior (for example makes eye contact, reaches for a toy) and higher scores for higher level joint attention behavior (points at something while maintaining eye contact, offers a toy while maintaining eye contact). A combination of 16 tasks and a score for verbalization allowed a child to reach a maximum total score of 143 points. IJA (8 of the 16 tasks), which refers to the frequency with which the child uses eye contact, pointing and showing to initiate shared attention to objects or events, and RJA (5 of the 16 tasks), which refers to the child’s skill in following the tester’s line of vision and pointing gestures, were rated. Based on 13% of randomly chosen cases, the intra-class correlation coefficient of two independent coders, blind to each child’s experimental condition, was .92 for IJA and .94 for RJA.

*Play behavior*

Children’s play behavior was observed during a 15-minute videotaped free-play session. The children were provided with a standardized set of toys including a tea set (cups, saucers, teapot
and spoons), a doll and related attributes, cars, a garage, a puzzle, a pop-up toy, a spinner and a book. The parent was instructed to passively monitor while the child was playing. When the child was seeking contact or interaction, the parent was allowed to respond in a natural way. Play behavior was coded using the ethogram of Naber et al., (2008), based on an ethogram previously developed by Ungerer and Sigman (1981). The video segments were watched and coded by trained students for toy preference and level of play category; (1) manipulative, (2) relational, (3) functional, and (4) symbolic play, every 10 seconds during 15 minutes. The highest level of play shown (ranging from 1 to 4) and variation in play by toy preference were used in the analyses. Based on 16% of randomly chosen cases, intra-class correlation coefficients of three independent coders, unaware of the child’s experimental condition, for level of play and variation in toy preference were .71 and .99, respectively.

Results
To check the equivalence of the experimental and control group at pretest after the random group assignment, independent sample \( t \)-tests and chi-squared tests were performed. No significant differences between the VIPP-AUTI and CU group were found for child’s gender, age, autism characteristics, cognitive and language developmental level and challenging behavior at pretest (see Table 1). However, significant group differences were found on child’s school attendance. Regardless of age, more children in the CU group visited school \( n = 10 \) than children in the VIPP-AUTI group \( n = 4 \), \( \chi^2 (1, N = 76) = 3.99, p < .05 \). School attendance was thus included as a factor in further analyses.
Table 1 Background and pretest variables in experimental and control groups

<table>
<thead>
<tr>
<th>Child Characteristics</th>
<th>Group</th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VIPP-AUTI (n = 40)</td>
<td>CU (n = 38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>t</td>
<td>p</td>
<td></td>
</tr>
<tr>
<td>Age (months)</td>
<td>42.16</td>
<td>09.02</td>
<td>43.80</td>
<td>10.92</td>
<td>0.72</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>Autistic characteristics</td>
<td>25.03</td>
<td>10.55</td>
<td>26.35</td>
<td>10.10</td>
<td>0.56</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Developmental level</td>
<td>74.63</td>
<td>23.50</td>
<td>72.68</td>
<td>20.61</td>
<td>0.39</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>Language comprehension age equivalent (months)</td>
<td>32.77</td>
<td>16.41</td>
<td>32.88</td>
<td>18.04</td>
<td>0.03</td>
<td>.98</td>
<td></td>
</tr>
<tr>
<td>Language production age equivalent (months)</td>
<td>33.71</td>
<td>15.89</td>
<td>30.22</td>
<td>16.35</td>
<td>0.85</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Child’s challenging behaviors (ABC)</td>
<td>53.96</td>
<td>26.82</td>
<td>51.08</td>
<td>23.30</td>
<td>0.49</td>
<td>.63</td>
<td></td>
</tr>
</tbody>
</table>

Note. ABC: Aberrant Behavior Checklist.

Bivariate correlations among post-intervention parental sensitivity, structuring and non-intrusiveness (EAS scores) and follow-up joint attention and play behavior were computed. As expected, IJA and RJA were significantly correlated \( r(72) = .62, p < .01 \). Parental sensitivity and structuring were significantly related to child joint attention; sensitivity and IJA \( r(72) = .35, p < .01 \), sensitivity and RJA \( r(72) = .35, p < .01 \), structuring and IJA \( r(72) = .27, p < .05 \), structuring and RJA \( r(72) = .34, p < .01 \). More parental sensitivity and structuring were associated with better joint attention performance of the child. No significant relations were found between parental non-intrusiveness and child joint attention. Child play behavior did not show significant correlations with parental sensitivity or non-intrusiveness. Parental structuring was associated with higher levels of child play \( r(72) = .26, p < .05 \), but not significantly correlated with child variation in toy preference. Level of play was significantly related to RJA \( r(72) = .37, p < .01 \), but not to IJA \( r(72) = .19, p = .10 \) (see Table 2).
Table 2 Pearson correlation matrix among parental sensitive, structuring and non-intrusiveness by scores on the Emotional Availability Scales at posttest, Joint Attention, and Play behavior at follow-up (N=72)

<table>
<thead>
<tr>
<th></th>
<th>Non-intrusiveness</th>
<th>Sensitivity</th>
<th>Structuring</th>
<th>IJA(^a)</th>
<th>RJA(^b)</th>
<th>Play level</th>
<th>Play variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-intrusiveness</td>
<td>.70**</td>
<td>.59**</td>
<td>.12</td>
<td>.14</td>
<td>.14</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
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<tr>
<td>Structuring</td>
<td></td>
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<td></td>
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<tr>
<td>IJA(^a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.62**</td>
</tr>
<tr>
<td>RJA(^b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.37**</td>
</tr>
<tr>
<td>Play level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.10</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, \(^a\)IJA: Initiating Joint Attention sum scores, \(^b\)RJA: Responding Joint Attention sum scores

Intervention Effect on Children’s Joint Attention

A repeated measures multivariate analysis of variance (MANOVA) with VIPP-AUTI versus CU and school attendance as between-subjects factor and time as within-subjects factor was performed to assess the development of joint attention behavior across pretest and follow-up assessment. The three-way interaction of group by school attendance by time was significant for IJA, \(F (8, 61) = 2.35, p = .03\), partial \(\eta^2 = .24\) (see Table 3). The three-way interaction of group by school attendance by time for RJA was not significant, \(F (5, 64) = 1.84, p = .12\), partial \(\eta^2 = .13\).
Table 3 Mean values of Joint Attention (as indicated on scores by the Early Social Communication Scales) and Play behavior of groups at pretest and follow-up

<table>
<thead>
<tr>
<th>Joint Attention</th>
<th>Group</th>
<th>VIPP-AUTI (n=38)</th>
<th>Care as Usual (n=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pretest</td>
<td>IJA&lt;sup&gt;a&lt;/sup&gt;</td>
<td>31.45</td>
<td>07.12</td>
</tr>
<tr>
<td></td>
<td>RJA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>48.05</td>
<td>17.03</td>
</tr>
<tr>
<td>Follow-up</td>
<td>IJA&lt;sup&gt;a&lt;/sup&gt;</td>
<td>33.42</td>
<td>06.86</td>
</tr>
<tr>
<td></td>
<td>RJA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>51.68</td>
<td>17.38</td>
</tr>
<tr>
<td>Play behavior</td>
<td></td>
<td>(n=40)</td>
<td>(n=35)</td>
</tr>
<tr>
<td>Pretest</td>
<td>Play level</td>
<td>3.13</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Play variation</td>
<td>6.88</td>
<td>2.14</td>
</tr>
<tr>
<td>Follow-up</td>
<td>Play level</td>
<td>3.28</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>Play variation</td>
<td>5.83</td>
<td>2.28</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>IJA: Initiating Joint Attention sum scores, <sup>b</sup>RJA: Responding Joint Attention sum scores

In particular, for children who did not attend school, the intervention was effective in increasing IJA behavior between pretest and follow-up, $F (8, 49) = 2.41, p = .03$, partial $\eta^2 = .28$ (see Figure 2). Because VIPP-AUTI demonstrated only effectiveness in enhancing parental non-intrusiveness (Poslawsky et al., under review, see chapter 4) and parental non-intrusiveness at post-test was not significantly related to child joint attention at follow-up, parental non-intrusiveness could not mediate the effect of VIPP-AUTI on children’s IJA skills.
Intervention Effect on Children’s Play Behavior

A repeated measures MANOVA with VIPP-AUTI or CU and school attendance as between-subjects factor and time as within-subjects factor revealed no significant three-way interaction of group by school attendance by time for level of play and play variation across pretest and follow-up assessment, $F(2,70) = 0.44, p = .65$ partial $\eta^2 = .01$ (see Table 3). For children who did not attend school no significant interaction of group by time was found either, $F(2, 58) = 0.15, p = .86$, partial $\eta^2 = .01$.

Discussion

In this randomized controlled trial the parent-mediated VIPP-AUTI program proved to be effective on improving child initiating joint attention behavior. Three months post-intervention, the children of parents who received the VIPP-AUTI intervention demonstrated higher levels of IJA than children whose parents received usual nursing home training. In particular, children
who did not yet attend school demonstrated enhanced IJA skills after the VIPP-AUTI program. Intervention effects on responding to joint attention and play behavior were however not significant.

As mentioned before, IJA refers to the child’s ability to create or indicate spontaneously another person’s visual attention to share, while RJA is defined as the child’s ability to follow and share another person’s visual attention leads (e.g. Mundy et al., 2009). VIPP-AUTI demonstrated to have a therapeutic effect on the child’s IJA but not on RJA, despite significant associations between IJA and RJA. An explanation may be that IJA and RJA follow different pathways in social neurocognitive development (Mundy et al., 2009), accompanied by differences in intervention susceptibility. Furthermore, an association between the quality of parent-child relationship and infants’ IJA rather than RJA was found previously (Claussen et al., 2002), which is in line with our results.

In our sample, school attendance was a potentially confounding factor, because more children in the control group visited school than did children in the VIPP-AUTI group. The effectiveness of VIPP-AUTI on children’s IJA was demonstrated especially in children who attended day-care instead of school. It is possible that the underlying factor explaining the results is the amount of time the parent and child spent together. Children who visited day-care spent fewer hours per week outside their home environment than children attending primary school. Thus, children who did not attend school spent more hours at home, and potentially profited more from the effects of the intervention on their parents. Our study included however only 14 children attending school, and replication of the moderating effect of school attendance in a larger sample is badly needed.

VIPP-AUTI demonstrated effectiveness in enhancing parental non-intrusiveness (Poslawsky et al., under review; see chapter 4). Given the absence of an association between parental non-intrusiveness at post-test and children’s joint attention at follow-up, the effect of VIPP-AUTI on children’s IJA could not be explained by parental non-intrusiveness as a mediating variable. Additional parent-centered factors, beyond our study focus, might have acted as mediators. VIPP-AUTI aims at promoting parents’ understanding of the autistic traits of their child, in order to optimize parent-child interaction. The intervention addresses aspects of parental states of mind, such as mind-mindedness or insightfulness. Mind-mindedness refers to parents’ attuned comments to the child’s state of mind (Meins et al., 2003), and is associated with social-
cognitive development of the child (Meins et al., 2013). Parental insightfulness focuses somewhat broader on the relation between positive parenting and parents’ empathic insight in their children’s motives underlying their behavior (Oppenheim & Koren-Karie, 2002). VIPP-AUTI might have enhanced maternal insightfulness of their children. In future studies with VIPP-AUTI, the potential mediating role of mind-mindedness and insightfulness in changing children’s developmental outcome should be examined.

No significant intervention effect was found on children’s play behavior. Children of both groups showed the same levels of play and variation in play. Play behavior was measured during unstructured, solitary play of the children. Although the primary caregiver was in the same room, the instruction was that he or she stays passive. As part of the VIPP-AUTI intervention, parents were shown how to motivate their child, challenging the child to engage in more active play. However, during free play, the child has to motivate itself, which may result in its familiar and often restricted play behavior. An assessment of children’s play level in a more structured session might show evidence of experimentally enhanced quality of parent-child interaction and child play as a result. It should be noted that other studies aimed at improving play behavior of children with ASD provided treatment at the level of the child (Jung & Sainato, 2013), while in our study VIPP-AUTI focused on the parent in interaction with the child. Whereas VIPP-AUTI addressed enjoyable engagement and awareness of the child’s interests to improve children’s play development, more active, direct and systematic teaching strategies may be needed, including a play context with peers (Jung & Sainato, 2013). Optimizing parent-child interaction, which is the aim of VIPP-AUTI, may serve as a base for additional treatment targeted at improving play behavior of children with ASD.

We compared the effects of VIPP-AUTI with an intensive type of care as usual. Therefore, the finding of children’s enhanced IJA can be interpreted as treatment specific, which supports the use of VIPP-AUTI in clinical practice. However, a limitation of the study is the relatively brief follow-up period of three months for the assessment of child outcomes. Another limitation is the potentially restricted generalizability due to the rather homogeneous sample of families’ sociodemographics and the mono-center study design. Therefore, future research including multicenter and longitudinal studies is needed.

In sum, this randomized controlled trial demonstrated the effectiveness of VIPP-AUTI, a short term parent-mediated program, in influencing initiating joint attention in children with
ASD. We suggest that VIPP-AUTI can provide early and effective support in parenting children with ASD to promote some of these children’s crucial social skills even on top of specialized care as usual.

References


