

Autism and social-emotional attachment: A validation study of a new instrument

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Abstract

The present study examined the initial psychometric quality of a new instrument; the ADAut (Attachment Development Autism). The ADAut is composed to delineate the specific developmental attachment stages of individuals with autism, with the assumption that attachment develops in a sequenced order of stages. Data were collected from a Dutch psychiatric institutional outpatient autism population and all participants (n=31) were recently diagnosed with ASD according to DSM-V criteria. All ADAut data were gathered by two raters and a self-report questionnaire for friendship was also filled out, the FQ. The following aspects were studied; 1) inter-rater reliability, 2) reliability of the ADAut scales and 3) to investigate convergent validity, it was hypothesized that the developmental stages of attachment were related to the formation of friendship as assessed with the FQ (Friendship Questionnaire). The results suggest that the intraclass correlations (ICC's) are good, from .77 to .99, indicating a high interrater reliability, except for one outlier on subscale B (focus on the self). Cronbach's alpha's for consistency differ on the three subscales; respectively a high internal consistency (subscale C; focus on others), an internal consistency on subscale A (focus on the attachment person) of $\alpha = .79$ and on one subscale (subscale B) the items correlated low. Two of the three subscales show a strong positive Pearson's correlation with the FQ. Major findings of this study are that the results lend substantive support that the ADAut is reliable and valid, yet the ADAut needs to be validated with larger samples representative of the general population.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition which unfolds during the first few years of life and involves difficulties in social communication with concomitant restriction of interests, coupled with repetitive behavior (American Psychiatric Association, 2013). Deficits in emotional engagement

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may be involved in atypical social–emotional outcomes and are characteristic of autism spectrum disorder (ASD) (Lambert-Brown et al., 2015).

According to Delfos (2011) types of attachment and stages of development in autism can develop later and slower than in a typical development. In addition, according to Bastiaanse et al. (2011), autism is not a defect, but a delay, a delayed development in the social area. Hua et al. (2011) add that some brain functions of children with autism develop slowly, especially related to social interaction, communication and repetitive behaviors. According to Lai et al. (as cited in Montgomery et al., 2016) “research consistently shows that children with ASD develop theory of mind skills later than children who are developing typically”.

Although a large body of literature exists concerning autism spectrum disorder and also with respect to attachment, research concerning the relationship between attachment or social emotional attachment and autism spectrum disorders (ASDs) is still scarce.

To our knowledge, there is no validated instrument that measures the stage of social and emotional attachment of a person with autism.

According to Loekemeijer et al. (2015), attachment develops in a sequenced order of stages. These authors composed an instrument to delineate the specific developmental attachment stages of individuals with autism. Based on their clinical experiences Loekemeijer et al. (2015) developed a new instrument, the ADAut (Attachment Development Autism; Loekemeijer Methode, 2015), with the assumption that there are three developmental areas with each seven stages of development in attachment in a person with autism. This instrument focusses on feeling and does not include cognition. The assumption that development of attachment in autism is possible is not shared by the majority of clinical scientists. Although according to Scheeren et al (2013) there are developmental skills in autism which change over time.

In the current study, psychometric quality of a newly developed instrument for attachment in autism is reviewed. If this instrument proves to be reliable and valid, it may be useful in clinical practice: the social-emotional developmental stage which an individual with autism has reached can be determined. Treatment can then be focused on stage related issues.

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Method

Participants

All participants were recruited from the “autism-team” population of outpatients of a mental health organization in Amsterdam, the Netherlands. Participants were eligible for this study if they were aged 18 years or older and were all recently diagnosed with ASD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) criteria (American Psychiatric Association [APA], 2014). Exclusion criteria were: younger than 18 years, an IQ below 70 and no mastery of the Dutch language.

In total 31 participants with ASD were interviewed between June 2016 and October 2017. All participants (11 women 35.5%, 20 men 64.5%, $M_{age} = 44.7$ years, age range; 24-65 years) who were eligible and willing to participate provided written consent.

Materials

The ADAut (Attachment Development Autism; Loekemeijer Method, 2015) used in this study measures the developmental stages within the domain of attachment. The ADAut specifies three thematic scales of attachment; A. focus on the attachment person (development of the attachment relationships), B. focus on the self (emotional development), and C. focus on others (social development).

The three scales (A, B and C) are constructed as decision trees in which the routing determines in which developmental stage (stage 1-7) a participant ends up. Each of these three scales again contains subscales; subscale A has five subscales; B six subscales and C has four subscales. Every subscale on which the raters score, ends in one of the seven stages of development, described in Table 1.

Table 1

Attachment schedule for developmental stages in autism and adults

	Focus on the attachment person (A).	Focus on the self (B)	Focus on others (C)
Subscales	A1. Syness A2. Proximity, attachment and emotional support A3. Show interest A4. Feelings and emotions of the attachment person A5. Social evaluation and reasoning	B1. Own will B2. Area of interest and sustained attention B3. Feelings and emotions B4. Evaluate emotionally B5. Emotional reasoning B6. Self-image	C1. Feel safe with unknown or lesser-known people C2. Show interest C3. Feelings and emotions of others C4. Social evaluation and reasoning

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Stage 1	Focuses on the first voice of the attachment person. This voice attracts more attention than voice sounds from others. Shows no preference yet.	When expressing basic needs focuses on the voice of the first attachment person or any other person who is close at hand.	Focuses on random others and tries to get the attention to keep them close.
Stage 2	Distinguishes the attachment person and others. Unilateral interaction; focuses on the attachment person to fulfill basic needs.	Deliberately draws attention to fulfill basic needs.	Is still open to others in general.
Stage 3 A1 to A5 B1 to B6 C1 to C4	Focuses very strongly on the attachment person through syness . Resistance, panic, stress or retreats at (approaching) farewell.	Shows resistance, panic, stress or retreats with (approaching) farewell and with (approaching) presence or interaction with strangers.	Shows resistance, panic, stress or retreats with (approaching) interaction with strangers.
Stage 4 A1 to A5 B1 to B6 C1 to C4	Close proximity, confirmation and emotional support needed from attachment person to come outdoors to (appropriate) interaction and daily responsibilities. Shows only practical interest in interaction only with shared interests.	Is very focused on self and own specific interests (egocentric); has own strong will and shows strong resistance or retreats to obstacles; no self-regulation yet. Explores boundaries. Resistance to change.	Resistance, panic, stress or retreats when (approaching) interaction with strangers start to decrease. Shows only practical interest in interaction only with shared interests.
Stage 5 A1 to A5 B1 to B6 C1 to C4	Begins to attach to important nearby relatives. Shows beginning interest in emotions of attachment person. Expresses basic emotions of attachment person; tries to take this into account.	The very strong focus on self and own will begin to decline; begins to distribute attention to other interests. Proceed to express own basic emotions and regulate them with support. Forms self-image by attributing characteristics.	Shows basic interest in the emotions of others. Expresses basic emotions of others; tries to take these into account.
Stage 6 A1 to A5 B1 to B6 C1 to C4	Adheres to important relatives and demands emotional support. Appoint secondary emotions, shows more interests, empathizes, takes others into account and shows compassion. Will evaluate and reason. Compares attachment person with other adults.	Starting self-regulation: will make secondary emotions known, evaluate emotionally and adjust reasoning and behavior. Forms a self-image through social comparisons.	Focuses more automatically on others. Will appoint secondary emotions, basically show more interest, empathize, take into account and show compassion. Will evaluate and reason.
Stage 7 A1 to A5 B1 to B6 C1 to C4	Basic attachment and independence. Basic mutual interaction; can basically empathize with, take into account and show sympathy to the	Basic self-regulation; can basically express one's own emotions, evaluate emotionally and basically adjust reasoning and attitudes	Basic mutual interaction; is able to basically empathize with, take into account and show sympathy to the attachment persons.

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attachment person. Can evaluate and reason basically appropriately.	to circumstances and changes.	Can evaluate basically and reason appropriately socially.
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Note 1. The text in the columns is from ADAut (Loekemeijer Method, 2015).

Note 2. Stage 1 and stage 2 do not apply in adults. These stages only occur in baby phase. For the sake of completeness, they are included in the table.

Note 3. The stages are all based on feeling, not on cognition or on learned cognitive tricks.

These 15 subscales are based on general insights of developmental psychology and on Loekemeijer's own clinical experience (2015). For instance, on scale B (focus on the self) in stage 4 a participant has his/ her own 'strong will' and he/she shows strong resistance or retreats to obstacles. In stage 7 there is already a basis of self-regulation.

A participant may, for example, reach a higher stage on scale A, have a lower stage on scale B and at the same time emerge higher again in a stage on scale C. To make sure that participants end up in the correct stage, the decision tree made use of control questions. If the raters "by mistake" would have asked further questions in a specific branch of the decision tree they were 'thrown back' at a previous stage in another branch of the tree. This ascertains a more valid stage diagnosis, by providing control questions. In case of exit at a lower stage, a larger number of questions in the decision tree were no longer applicable. These items concerned stages that were only relevant in a later developmental stage. At every subscale the raters started blank again and ending up in stage 1-7 was possible.

The goal of the application of the ADAut is to stimulate participants to reach higher levels in staging, by connecting outcomes with appropriate treatment in the specific developmental stages.

The Friendship Questionnaire (FQ) adapted from Baron-Cohen and Wheelwright, (2003) was used to investigate the relation to the attachment stage. According to Baron-Cohen and Wheelwright (2003) participants score high on the FQ if they like and are interested in people, and enjoy interaction for their own sake, and find friendships important.

It is hypothesized that the higher the attained level of attachment, the higher the probability that the person forms friendships. Participants completed the FQ, a 35-item questionnaire, on 27 items of which it is possible to score. This self-report questionnaire has a maximum score for each item of 5 points.

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Procedure

All data were gathered with a semi-structured interview (ADAut; Loekemeijer, 2015) by two raters and with the self-report questionnaire FQ (Baron-Cohen & Wheelwright, 2003). Data were collected between June 2016 and October 2017, under strict anonymity. All participants were informed about this study face to face and in a letter.

Prior to the first meeting, participants received a self-positioning questionnaire by e-mail to get a cautious indication of where they were assessing themselves on the ADAut and to prepare participants for the type of questions they would receive during the interview itself.

Participants were asked for their consent by the investigator on their first appointment after reading study information and informed consent. The ADAut was scored by two raters on paper and were then imported through Qualtrics software into SPSS.

Interview duration was two hours on average and took place on one of the locations of GGZ inGeest. The two raters were trained by the developers of the Loekemeijer instrument (2015). Both were psychologists and scored directly, each independently and separately during the interview on the same participants at the same time, enabling interrater reliability assessment.

To investigate convergent validity, it was hypothesized that the developmental stages were related to the ability to form close, empathic supportive friendships.

Statistical analysis

This observational, cross-sectional study concerns psychometric aspects of a newly developed instrument. Therefore, the following aspects were studied: 1. Interrater reliability by calculating the intraclass correlation coefficient (ICC) of the two raters of the ADAut 2. Reliability of the ADAut scales: Cronbach's Alpha's were used to assess internal consistency: they were calculated for all subscales and the scale as a whole. 3. Concurrent validity was assessed by calculating the correlation of every subscale (A, B and C) of the ADAut with the scores on the FQ.

In order to be able to perform the analyses properly (ICCs and Cronbach's alpha), the variables have been recoded from 1-7. The same format is used as in the ADAut; 1 as the lowest stage to 7 the highest possible stage.

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Statistical analyses were performed using SPSS version 25.0.

Results

Sixty-two interviews of 31 participants were entered into analysis. Table 2 shows the mean scores of the ADAut (subscales A, B and C), the mean FQ scores and the standard deviations (SD) of the ADAut and FQ.

Table 2

Mean and Standard deviations on the three different subscales (A, B and C) of the ADAut and the FQ

	Focus on the attachment person (A)	Focus on the self (B)	Focus on others (C)	Friendship Questionnaire
Mean	4.5	4.6	4.3	63.16
SD	.40	.26	.39	23.65

The ICC's of all 42 scales of the ADAut ranged from ICC = .77 to ICC = .99. With an outlier on subscale B (ICC = .66).

Cronbach's alpha of the total ADAut scales was $\alpha = .69$. Cronbach's alpha was also calculated for the individual sub-scales A, B and C; alpha subscale A (focus on the attachment person) was $\alpha = .79$, indicating good internal consistency. Subscale B (focus on the self) had an alpha of $\alpha = .38$. The items on this subscale correlated low. All alpha's on subscale B were around the overall alpha of .4. Cronbach's alpha on subscale C (focus on others) was $\alpha = .88$ indicating high internal consistency.

The Pearson correlation (one-tailed) of the ADAut subscale A with the total FQ score was not significant, Pearson's $r(31) = .27, p = .073$. The FQ and the ADAut subscale B were positively correlated (one-tailed), Pearson's $r(31) = .39, p = .015$. The correlation of FQ and ADAut on subscale C was significant Pearson's $r(31) = .53, p = .001$.

Discussion

The results of this study suggest that the intraclass correlations (ICC's) for the two raters of the ADAut are good, indicating a high interrater reliability, except for one outlier on subscale B (focus on the self). This variable is about emotional

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development, more specific this item concerns participants being focused on themselves. An explanation may be that the answer possibilities have apparently been interpretable in several ways for the raters.

When looking at Cronbach's alpha, it is striking that on subscale B the Cronbach's alpha is significantly lower than on both other subscales. An explanation for this could be that there are fewer items here or that it is conceptually not worked out properly. Cronbach's alpha on subscale C (focus on others) even had a high internal consistency.

The Pearson correlations on subscale A, B and C of the ADAut with the FQ vary. Correlation of subscale C with the FQ was as expected very high. This means that there is a significant correlation between subscale C assessing focus on others and the Friendship Questionnaire. The results seem to point out that variables on subscale C (focus on others) and the FQ tend to be strongly related. In orientation towards the self (subscale B) with the FQ, significant positive correlations are also found, there probably is a theoretically well conceivable relationship between the two concepts. These results suggest that variables that are about recognizing and expressing one's own emotions (focus on self, subscale B) are relevant for forming friendships measured with the FQ.

The association of the domain 'focus on the attachment person' (subscale A) with the FQ could not be demonstrated. When taken into account that variables on subscale A concern questions concerning only the most important attachment person, it is understandable that variables concerning social development (focus on others than the main attachment person; subscale C) are more in line with forming friendships, as measured with the FQ. Altogether, compared to scores on the FQ, a reliable and valid instrument, a correlation has been found with two of the three subscales.

This study has important strengths and also some limitations. One of the important strengths is that this instrument is unique in Autism research: it is the first attachment staging instrument so far.

Another strength is that this instrument contributes to an area that unfortunately has not received much attention while clinical practice shows that autistic persons do develop in an attachment process. People with autism tend to end up in a lower stage on the ADAut after they just received the autism diagnosis, yet after intensive treatment clinical practice shows that participants can increase to a

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higher stage of development. It would be interesting to continue this kind of research to examine to what extent participants with autism grow to a next stage on the ADAut as a consequence of treatment and thus be able to develop further.

A limitation could be that due to the small number of participants there was little variation in staging. However, as mentioned before it is the researchers' expectation that even with a larger number of participants, this variation may remain small if clients have not yet received treatment or guidance that is linked to the developmental stages. Since all participants in this study only recently received the autism diagnosis and had not yet received treatment this could be an explanation for the little variation in staging. It would be interesting for future research to explore this further. Furthermore, it is to be expected that people without autism end up in a higher stage than people with autism: it would be of great psychometric value to investigate this in a representative sample of the general population. This would also allow the determination of cutoff values for attachment levels according to an autistic diagnosis.

Another limitation is the fact that the ADAut is a complicated tool, the purchase of this instrument takes a lot of time and it is necessary to be trained before being able to use the instrument.

Since the ADAut is constructed as a decision tree, there are always items that participants in the demand route do not end up with. Therefore, there are many missing variables which could not be tested for their suitability. To ensure that the instrument remains objective every subscale started again at the beginning, thus all the stem items of each subscale have been included in the statistical analysis. In our opinion, for a first psychometric analysis to include only the main questions of the decision tree in the analysis is already informative. Unfortunately, due to the many missing items and the small sample of $n=31$ it has not been possible to apply factor analysis. In a sample of subjects at least 5 times the number of variables in factor analysis is required. By means of factor analysis – with a sample of at least $N=300$ - it could be investigated whether the stem variables do accord with three factors, by means of confirmatory factor analysis. Thus there are ample indications to give direction for further research.

Further, we conclude that the ADAut is a very complete instrument and participants found it interesting to participate. To make the interview shorter, future research should focus on which items might be unnecessary.

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Altogether, the main findings of this study are that the results lend some support that the ADAut measures what it is supposed to measure, but the ADAut needs to be validated in other samples. It can be of good support to use the ADAut in regular mental health care (in adults with autism) in order to be able to make an estimate of the focus on oneself, the other person and the attachment person. It provides a good picture of the client's situation for both the examining psychologist and the client, as a starting point for treatment.

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