

CASE STUDY

Developing a therapeutic relationship with a blind client with a severe intellectual disability and persistent challenging behaviour

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Abstract

Purpose. A blind, severely intellectually impaired boy aged 17 with Down syndrome and persistent serious challenging behavior received attachment-based behavior modification treatment. The aim was to study the effect of the treatment and the development of the therapeutic attachment relationship.

Method. In a single-case study, attachment therapy sessions alternated with control sessions. Treatment started with attachment therapy (phase 1), followed by behavior modification (phase 2). The instruments used were: Residential observation lists for challenging behavior, video analyses of attachment behavior in therapy sessions and physiological indicators of affect regulation measuring the pre-ejection period (PEP) and respiratory sinus arrhythmia (RSA) as indices of cardiac sympatho-vagal activity.

Results. The client exhibited less frequent and less intensely challenging behavior. The data indicated more appropriate replacement behavior and less PEP arousal during the behavior modification treatment given by the attachment therapist compared to the control therapist who used the same protocol. The client showed more active and longer-lasting attachment behavior, especially proximity seeking, towards the attachment therapist than towards the control therapist.

Conclusions. Attachment-based psychotherapy proved successful in eliciting attachment behavior in a severely intellectually disabled, socially deprived, behaviorally and affectively dysregulated adolescent. The resulting relationship proved to be a therapeutic platform conducive to behavior change.

Keywords: *Attachment-based psychotherapy, psycho-physiological stress, behavior modification, challenging behavior, intellectual disability, visual impairment*

Introduction

In an attempt to understand the challenging behavior shown by clients with a severe or profound intellectual disability (ID), Janssen, Schuengel and Stolk [1] developed a stress-attachment model. According to this model, persons with intellectual disabilities have fewer coping skills and are therefore more vulnerable to stress. Stress may be buffered by support from significant others, especially from attachment figures [2,3]. In essence attachment is primarily characterized as the tendency to seek comfort in times of stress and to use the attachment figure to achieve a state of emotional homeostasis, allowing exploration of

the environment [4,5]. Children with ID, however, are at risk of developing insecure attachment relationships, in particular disorganized attachment (see [6] for a review). An additional risk factor is present when children with ID also have a visual disability. Eye contact is thought to play an important facilitating role in the development of attachment between infants and their parents. Fraiberg [7,8] found that the development of attachment between parents and infants was delayed in blind children.

In order to directly influence children's severe and persistent challenging behavior, pharmacotherapy or behavior modification are usually indicated as

treatment options [9,10]. Pharmacotherapy may have unwanted side-effects, especially in children [11]. Indicated behavior modification approaches are (differential) reinforcement of alternative or incompatible behaviors (e.g. [12]) as well as 'Functional Communication Training' (FCT) [13]. FCT is a method to train communicative behaviors that allow the client more control over his or her environment. Several authors have reported that FCT on its own may not be sufficiently effective for clients with severe challenging behavior [14,15]. To effect a clinically significant reduction in destructive behaviors for these clients, they added mild punishment to FCT. Furthermore, behavior modification is not always effective as some children with serious intellectual and visual impairments appear insensitive to social contingencies on their behavior, impeding the therapeutic use of social reinforcers to treat challenging behavior and shape adaptive behavior (e.g., [16]).

Are there alternatives to adding punishment to increase the effectiveness of interventions such as differential reinforcement or FCT? Attachment-based interventions have been developed aimed at improving the parent's or caregiver's sensitive responsiveness towards children with intellectual and/or sensory disabilities. Positive results have been reported for these interventions [17–19]. However, attachment-based interventions and behavior modification may also be combined in order to obtain even stronger treatment effects. As an example with non-disabled children, Fisher, Gunnar, Chamberlain and Reid [20] developed an integrative treatment program for maltreated children who had been placed in foster care which combined behavior modification methods with techniques to enhance sensitive responsiveness in the foster parents. Their experimental study indicated that the treatment was effective in improving the children's behavior, but also that hypothalamic-pituitary-adrenal (HPA) hyperactivation was reduced, as measured by the concentration of salivary cortisol (a 'stress hormone'), resulting in a long-term positive effect. Synergy between attachment-based and behavior-based treatment may be the result of the increased salience of social rewards by the attachment figure, and of improved affect regulation, which is conducive to learning new behavior. Behavior modification may therefore be more effective when conducted by a therapist who has been building on an attachment relationship with a client than by a therapist who has no special relationship with the client, especially when clients have been showing low responsiveness to social contact previously. In the current study it was tested whether an attachment-based intervention would enhance the effectiveness of behavior modification in clients who have been

shown to be difficult to treat, and whether this might be explained by more effective stress regulation by the child in the presence of the attachment therapist. Thus, this integrative treatment was expected both to positively influence the behavior of the client and positively affect the underlying intra-psychic processes of stress-regulation.

The effect of the integrative approach, an attachment-based behavior modification treatment, was tested in this case study. Because of the particular importance of the therapeutic relationship, attachment behavior and stress-buffering was studied intensively within that relationship. The objectives of our study were as follows. First, we wanted to verify if challenging behavior in the group home was reduced during therapy, and during what phase of the therapy this change in behavior occurred. Second, behavior modification aimed to replace challenging behavior by alternative appropriate behavior was expected to be more effective when conducted by a therapist who had been building an attachment relationship compared to behavior modification conducted by a therapist who was familiar, but had no special relationship. Third, we investigated the therapeutic relationship for evidence of a developing attachment between the client and the therapist. We expected that the client would display more attachment behavior towards the attachment therapist than to the control therapist and that this behavior would increase in the course of the attachment therapy. Finally, less activation of the autonomic nervous system was expected when the attachment therapist engaged in the stressful part of the treatment, during behavior modification, than when the control therapist did so. These electrophysiological measures were used as an important additional window to gauge the regulation of stress and wellbeing in clients with communicative problems, as well as to measure effects of interventions aimed at these outcomes [21].

Method

Participant

Roy was a blind, 17-year-old boy with a diagnosis of Down syndrome. Although no formal IQ scores were available, he was considered to be severely intellectually impaired. Roy was not toilet trained and was unable to feed and dress himself. He was completely isolated from the world. He persistently engaged in severe self-injurious behavior, aggression and disruption. The behavior was noted as severe and persistent with the highest score on the 'Consensusprotocol Ernstig Probleemgedrag – Nationaal Ziekenhuisinstituut', a widely used Dutch protocol for measuring challenging behavior, with a reliability Cohen's kappa

of 0.91 and high external validity [22]. Roy had been mechanically restrained because he scratched himself to such an extent that he seriously injured his arms and chin. He also scratched and spat at his caregivers, resulting in limited contact with them.

Roy lived in a group home for children with severe intellectual impairments. Because of the need for special medical care and his complex home environment, his parents were not able to provide adequate care. He spent the first year of his life in hospital and then moved to a 24-hour care facility. He frequently had to move from one group home to the next and encountered numerous caregivers. His challenging behavior started very early. Roy's history included early pathogenic care, based on the criteria for attachment disorder (DSM-IV: Persistent neglect of basic emotional needs for comfort and affection; persistent neglect of physical needs; frequent changes of regular caregiver). None of the medical interventions, medication for allergies and special diets, and the frequent behavior modification treatments he received was successful. An independent psychiatrist with extensive experience with clients with a visual and intellectual impairment was consulted. This assessment did not reveal any contra-indications for the treatment protocol, such as aversion to physical contact, and did not indicate disorders in the autistic spectrum.

Roy's parents gave their written informed consent for his participation in this study and medical ethical approval was obtained from the Vrije University Medical Centre Medical-Ethical Review Board. This board is licensed to approve research by the Central Committee on Research Involving Human Subjects (CCMO), which is responsible for monitoring compliance with Dutch legislation governing medical research. In the protocol it was noted that if the client showed continued resistance to the use of the electrocardiogram, the treatment would continue without obtaining these physiological measures. Roy showed no resistance to the placement of the electrodes.

Intervention

An intensive integrative psychotherapeutic treatment was developed for highly challenging behavior in visually and severely intellectually impaired clients. The therapy is aimed at children for whom other treatments (e.g., standard behavior modification) have failed, and at children whose histories suggest that they may have had little opportunity to develop selective attachment, due to pathogenic care in the past (early disruptions in caregiving relationships, abuse, neglect). A therapist works with clients to induce intra-psychic changes during therapy. This integrative treatment consists of three

phases. Phase 1 is aimed at creating the conditions, following Bowlby [23], under which attachment may develop. First (phase 1.1), the therapist provides sensitive and inciting responses with the aim of making contact with the client. Contact-seeking starts with vocalization, as the blind or visually impaired client has to get to know the voice of the therapist. Touch can be added if the client feels comfortable when touched. The therapist reacts to the positive and negative reactions of the client by verbally reflecting the client's behavior and emotions. The next step follows once the therapist and the client have got to know each other and experience positive and enjoyable interaction and contact, which can easily be restored after contact is broken, and when the client initiates contact-seeking with the therapist. The therapist and client know each other when the therapist can anticipate the behavior of the client and when the client gives a sign, any behavioral or verbal indication, that he recognizes the therapist. The client shows that he enjoys the interaction and contact with the therapist by laughing, having fun and making pleasurable sounds. The therapist stimulates this by playing enjoyable games, for instance, giving a hug or rocking together.

Next (phase 1.2), mirroring and synchronizing are added to stimulate communication. During this symbiotic phase the therapist imitates the client's movements and behaviors, and provides anticipatory responses to the client's reactions in order to create a sameness in behavior. The therapist stimulates the client to take initiatives to start new cycles of interaction, but gradually introduces pauses and restarts. The therapist can begin phase 1.3 when synchronous cycles of behavior can be broken but easily restored, and when the client shows initiatives for interaction with the therapist.

Subsequently (phase 1.3), the therapist stimulates exploration of the environment, offering comfort when exploration results in anger or anxiety. The result may be an increased propensity to seek contact with or proximity to the therapist when the client exhibits distress or fear. When the client is comfortable to such an extent that he actively explores the environment, when the client enjoys the closeness of the therapist but also enjoys playing together and playing next to the therapist and when the client continues exploration when the therapist leaves the room, then phase 2 of the intervention may be introduced.

Phase 2 focuses on behavior modification to teach the client new and socially acceptable behavior as an alternative to challenging behavior. By means of a functional behavior analysis (ABC analysis) socially acceptable behavior is specified, and through systematic 'chaining' and 'fading' new appropriate

behavior is taught. Verbal and non-verbal social reinforcements like affectionate pats, hugs, approval and praise are given.

The last phase (phase 3: generalization) starts when challenging behavior has diminished and the client exhibits socially acceptable appropriate behavior instead. The therapist facilitates contact between the client and regular caregivers by giving feedback on the caregivers' sensitivity and responsiveness towards the client during video-training and team discussions. Over time, the number of sessions is slowly reduced until the therapy stops. The caregivers should continue to invest in the bond with the client through being sensitive and responsive towards the client, as taught by the therapist. The therapy ends when the transference of the principles of sensitivity and responsiveness to the caregivers, the principles of providing a *secure base* and a *safe haven* for the client [24] is completed. This is evident when the caregivers can soothe the child when distressed and when the caregivers appropriately stimulate the client's exploration of objects and the environment.

Procedure

During phase 1, attachment-based therapy as described above was given by the attachment therapist (therapist A). The control therapist (therapist B) provided only positive attention. Sessions systematically alternated over mornings and afternoons. After having completed the attachment-based intervention (phase 1 of the treatment), remaining challenging behaviors were screened and the challenging behaviors indicated by the caregivers as being the most disturbing were selected as target behaviors. A basic ABC analysis was conducted, based on observation and an interview with the caregivers, to identify the contingencies of these target behaviors. Subsequently, socially acceptable replacement behaviors that would serve as functional alternatives were defined for these target behaviors. Several challenging behaviors already appeared to have been extinguished after the attachment therapy (phase 1) (spitting, head banging and scratching himself). Roy's remaining target challenging behavior was scratching his caregivers. The ABC analyses showed that this scratching occurred in the following situations: (i) During free time, if he wanted to listen to some specific music; (ii) during social interaction, if he wanted to be left alone for a while; and (iii) during daily care, if he became impatient during meals. It is important to note that both therapists used the same intervention protocol during the behavior modification therapy (phase 2). Scratching behavior was ignored. The protocol included the following replacement behaviors:

Using his hand to ask for music. At the start of the session the therapist entered the room and turned on the radio (music he did not like). If Roy showed a reaction, such as a groaning sound, a frown or restlessness, it was interpreted as an indication that he wanted a different kind of music. By taking and shaking his hand the therapist enforced the use of his hand to show that he wanted another kind of music. Then the therapist praised Roy by giving him a pat on his shoulder, followed by changing the music. This was repeated at the end of the session.

Turning away or putting his hand under his legs. Roy did not like to be disturbed while listening to his favorite music. However, both the attachment therapist and control therapist sat next to him on his couch during their respective sessions. When Roy wanted to scratch the therapist, the therapist would soothe him verbally and verbally encourage him to turn around and put his hands under his legs. Positive verbal praise and a pat on his shoulder reinforced this self-controlling behavior.

Using his hand to ask for sweets. During every session the therapist put approximately 10 small soft sweets on a plate. The therapist announced that there were sweets on the plate and if Roy wanted a sweet he could put his hand on the therapist's leg and she would let him take one sweet. The therapist encouraged positive behavior by giving compliments and a shoulder pat. She encouraged him verbally to put his hand on her leg when he wanted another sweet. Whenever he accomplished this, he could take a sweet from the plate.

During phase 1 there were 18 videotaped 40–45 min sessions for each therapist; during the second phase there were 7 videotaped 40–45 min sessions for each therapist.

Instruments

Residential observation lists. Roy's professional caregivers recorded challenging behavior on the observation lists. They were instructed to score the frequency and intensity of this behavior. The behavior was scored every hour of each day during the intervention. Intensity was rated on a 10-point Likert-type scale with 1 as low and 10 as high; frequency was rated by the number of times the challenging behavior occurred during the past hour. Observation results were monthly reported and evaluated ensuring the subsequent continuation of the use of the observation lists.

Target challenging and target appropriate behavior. Each week one of the three therapy sessions given by the attachment therapist and one session given by

the control therapist were videotaped. A weekly frequency of video analysis was chosen on the basis of the expectation that change would occur over weeks, not days. Observers independently coded challenging and appropriate replacement behavior during the behavior therapy (phase 2) using Noldus computer software, The Observer (Noldus Information Technology, Wageningen, The Netherlands). The mean duration of these behaviors was calculated for each session. Inter-rater reliability was analyzed in 15 randomly selected sessions. Twenty-minute checks were done for 15 videotapes. For the frequency of target challenging behavior the inter-observer agreement was 78% and Cohen's kappa was 0.74; for duration it was 93% and 0.92. For the frequency of appropriate replacement behavior the interobserver agreement was 81% and the Cohen's kappa was 0.78; for duration it was 91% and 0.90.

Attachment behavior. We developed observation coding schedules for the four types of attachment behavior: Proximity seeking, attachment resistance, attachment avoidance and contact maintenance, based on the observation scales for mother-child interaction in the Strange Situation [24]. The coding schedules enabled recording of the intensity of these behaviors.

Proximity seeking by the client (physical or by means of an object). The observation schedule for proximity seeking identified initiatives by the client to seek proximity. Intensity of proximity seeking could vary from signaling (minimal) to locomotion (very active) on a 4-point scale.

Resistance by the client. The observation schedule for resistance identified the child's behaviors signaling resistance to the therapist while in contact. Resistance could vary from negative vocalizations (mild) to active squirming and/or pushing to get away from the therapist on a three-point scale.

Avoidance by the client. The observation schedule for avoidance was used to identify behaviors resulting in avoidance of contact with the therapist. Behaviors could vary from being slow to respond to overtures by the therapist and looking away briefly (mild) to being unresponsive for long periods while the therapist was trying to make contact (strong). 'Mild' avoidance was scored as showing 'no' avoidance because some behaviors indicative of mild avoidance were indistinguishable from typical behavior of people with a visual and intellectual disability, for example turning the head away during contact, thus using a three-point scale.

Contact maintenance by the client. Contact maintenance was coded as the active effort on the part of the client to hold on to the therapist after the therapist had signaled that s/he was about to leave. A three-point rating scale allowed for the distinction between mild, active or very active proximity seeking within the period from the therapist's signal that the session was over until the therapist really left the room.

Attachment behaviors were scored on the basis of videotapes of the treatment and control sessions, as described above. Observers independently coded the attachment behaviors during phase 1, using Noldus computer software, The Observer (Noldus Information Technology, Wageningen, The Netherlands). Observers were kept blind to therapist status and phase of therapy by offering the session recordings in random order. For mean frequency and duration of proximity seeking and contact maintenance behavior the interobserver agreement was 85% and Cohen's kappa was 0.71, for resistance the interobserver agreement was 94% and the Cohen's kappa was 0.77 and for avoidance the interobserver agreement was 83% and the Cohen's kappa was 0.64.

For the analyses, the total duration of each of the four attachment behaviors in each of the categories of intensity of the attachment behaviors was computed for each session. A weighted score was developed for each attachment behavior using the scale values (minimal attachment behavior + 2*mild attachment behavior + 3*active attachment behavior + 4*very active attachment behavior). We expected that all four forms of attachment behavior would be shown more in the presence of the attachment therapist compared to the control therapist.

Physiological indicators of autonomic arousal. The Vrije University-Ambulatory Monitoring System (VU-AMS) was used to record the electrocardiogram (ECG) and changes in thoracic impedance (ICG) [25]. With this device simultaneous and continuous assessment can be made of the Respiratory Sinus Arrhythmia (RSA) and Pre-Ejection Period (PEP). RSA is an index of activation of the parasympathetic division of the autonomic nervous system, and is relatively uninfluenced by sympathetic activation. RSA is the difference between the lowest interbeat interval (IBI) during inspiration and the highest IBI (in milliseconds) during expiration. PEP is an index of sympathetic activation, relatively uninfluenced by parasympathetic activation. PEP is a measure of cardiac sympathetic activity representing the time between the onset of left ventricular depolarization and the ejection of blood into the aorta (in milliseconds), a measure of contractility of the heart. When the client's movement does not change, any change in RSA and PEP can be

interpreted as the result of stress. Lower PEP and lower RSA indicate more stress. To create the PEP scores, coders reliably trained using sample cases ($r > 0.90$) inspected beat-by-beat data and removed movement artifact using custom software. To edit the RSA scores for movement noise, the software package was used by the trained raters reliable on sample cases ($r > 0.90$). Willemsen et al. [26] and De Geus et al. [27] provide information on the VU-AMS equipment and the adequate reliability and validity of the PEP and RSA data.

Data analysis

The sample mean of each therapy session was used for all analysis of PEP, continuously measured over every period of 30 seconds and for RSA, continuously measured over every respiration cycle. The hypothesis (H_0) of no difference in stress between both therapists during the behavior modification was tested. The natural assumption that people get used to situations and would therefore experience less stress in the presence of both therapists was taken into account. In this set of data with a natural increasing trend, isotonic regression could be used to find values that best fit the observations in the consecutive sessions of the four successive (sub-) phases [28]. Another reason to use isotonic regression was to enhance statistical power for testing the direction of the hypothesis [29]. The statistics in isotonic regression are based on likelihood ratios and are related to the F statistic in ANOVA. The probability of the F statistic indicated whether there were significant differences between the means in so far as they were compatible with the hypothesized order. The resulting p values of nonparametric bootstraps are reported.

Results

Challenging and appropriate behavior

Roy received the integrative treatment over a 12-month period. After completing the treatment a remarkably positive change was found in Roy's challenging behavior in his daily situation. The arm restraints he wore during the nine years preceding this intervention were no longer necessary and Roy even went to the kitchen to ask his caregivers to change the music instead of relapsing into his extreme self-injuring behavior. Daily observations of Roy's problem behavior during the course of treatment and on follow-up by the caregivers (in his home apart from the therapy situation) confirmed these large effects on behavior problems during treatment, effects that were for the largest part accomplished during the attachment therapy phase.

Table I and Figure 1 show the decrease in the mean frequency of challenging behavior scored by caregivers on the residential observation lists during the week preceding the sessions. The mean intensity rated by the caregivers followed the same pattern (Table I). ANOVAs for the frequency as well as for the intensity of all challenging behavior showed significant phase effects (frequency: $F = 11.68$, $df = 1, 134$, $p < 0.01$; intensity: $F = 13.56$, $df = 1, 134$, $p < 0.00$), indicating that positive effects generalized to daily situations outside the therapy.

To determine if the attachment therapist was more effective in behavior modification (phase 2) than the control therapist – both used the same protocol in this phase – we compared their videotaped sessions. The target challenging behavior rarely occurred during the behavior modification sessions and there was little difference between the attachment therapist (total duration of session: $M = 0.42$; $SD = 0.18$) and the control therapist (total duration of session: $M = 0.40$; $SD = 0.08$).

Figures 2 and 3 show the effectiveness, of both therapists in teaching appropriate behaviors 1 and 3 (the mean percentage of the total duration): asking for music (Figure 2) and using his hand to ask for

Table I. Means and standard deviations for frequency and intensity of all challenging behavior scored on the residential observation lists.

Challenging behavior	Therapy type	Mean	SD	N
Frequency	Attachment therapy	0.95	1.13	87
	Behavior modification	0.36	0.52	49
Intensity	Attachment therapy	2.31	2.54	87
	Behavior modification	0.88	1.25	49

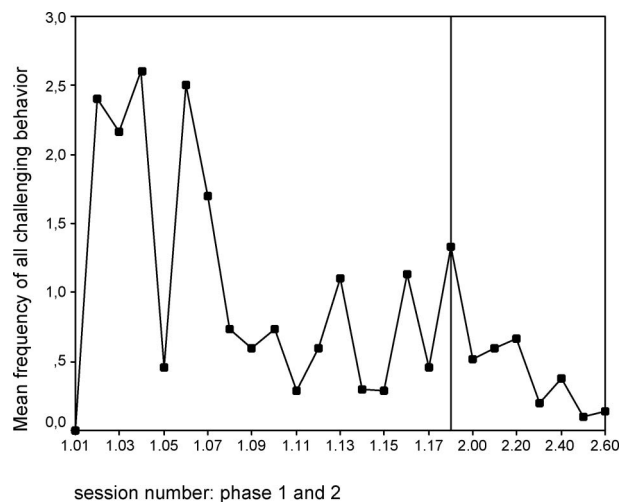


Figure 1. Mean frequency for all challenging behavior scored on the residential observation lists during the days preceding the sessions.

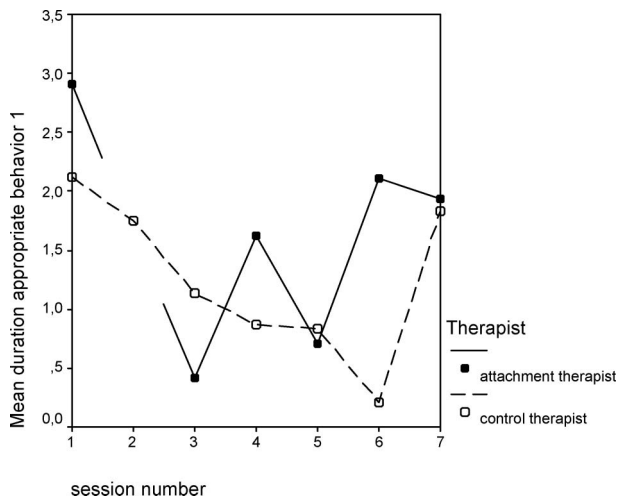


Figure 2. Mean duration for appropriate behavior 1 during the behavior modification (phase 2).

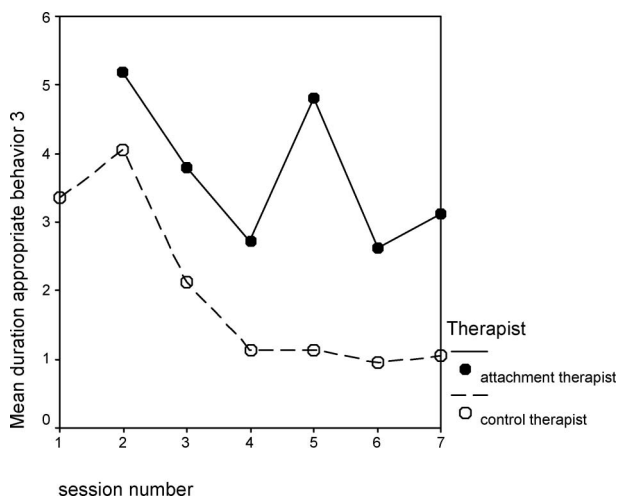


Figure 3. Mean duration for appropriate behavior 3 during the behavior modification (phase 2).

sweets (Figure 3). The sessions with outlying values were removed. The attachment therapist showed a higher effectiveness (appropriate behavior 1: $M = 1.6$; $SD = 0.92$; appropriate behavior 3: $M = 3.71$; $SD = 1.08$) compared to the control therapist (appropriate behavior 1: $M = 1.2$; $SD = 0.68$; appropriate behavior 3: $M = 2.0$; $SD = 1.26$). The independent samples t-test indicated that this difference was significant for the mean of appropriate behaviors 1 and 3 ($t = 2.38$, $df = 12$, $p < 0.04$). This significant difference was due to the significant difference in 'appropriately asking for music' ($t = 2.64$, $df = 11$, $p < 0.02$). Roy did not show significantly more self-restraint (appropriate behavior 2) when the control therapist conducted the therapy ($M = 9.4$; $SD = 7.85$) than when it was conducted by the attachment therapist ($M = 6.1$; $SD = 3.94$).

Attachment behavior

Proximity seeking by the client. Figure 4 shows the weighted score for proximity-seeking behavior, the mean percentage of the total duration of each session, during the attachment therapy phase of both therapists. The Figure shows more proximity-seeking behavior towards the attachment therapist ($M = 43.83$; $SD = 14.92$) than towards the control therapist ($M = 27.89$, $SD = 16.6$). The one-way ANOVA indicated that this difference was significant ($F = 9.18$, $df = 1$, 34 , $p < 0.005$). The proximity-seeking behavior towards the attachment therapist increased over time (start of the intervention: $M = 26.21$, end of the intervention $M = 56.00$).

Resistant attachment behavior by the client. Resistant attachment behavior was rare in the presence of either therapist. No significant difference was found in resistant attachment behavior (weighted) towards the attachment therapist ($M = 0.93$, $SD = 0.58$) compared to the control therapist ($M = 0.93$, $SD = 1.1$).

Avoidant attachment behavior by the client. Likewise, avoidant attachment behavior directed at the therapist was rarely scored in either kind of therapy and in all phases. Roy showed significantly more avoidant attachment behavior towards the attachment therapist ($M = 0.42$; $SD = 0.57$) than towards the control therapist ($M = 0.13$; $SD = 0.15$): ANOVA $F = 4.32$, $df = 1$, 34 , $p < 0.05$.

Contact maintenance by the client. Contact maintenance indicated Roy's proximity seeking behavior in the period after the therapist's signal that the session was over until the therapist left the room. He did not show significantly more contact maintenance towards the control therapist ($M = 32.56$; $SD = 37.59$) than towards the attachment therapist ($M = 16.41$; $SD = 19.39$).

Physiological indicators of stress

The mean PEP for each session is shown in Figure 5 (a lower PEP indicates more stress). During behavior modification (phase 2), when the client was provoked the attachment therapist seemed to be a buffer for stress as Roy showed less stress when this treatment was given by the attachment therapist ($M = 103.69$; $SD = 3.88$) than when it was given by the control therapist ($M = 98.12$; $SD = 3.03$). The isotonic regression analyses of the PEP difference in the stress level between the two therapists showed that the stress reaction was significantly stronger with the control therapist than with the attachment therapist ($p < 0.02$; the statistical significance of results was

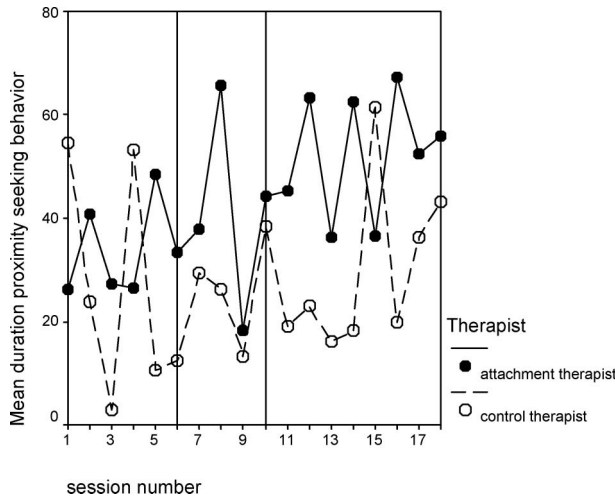


Figure 4. Mean duration for proximity-seeking behavior (weighted) during the attachment therapy (sessions 1–6 = phase 1.1, sessions 7–10 = phase 1.2 and sessions 11–18 = phase 1.3).

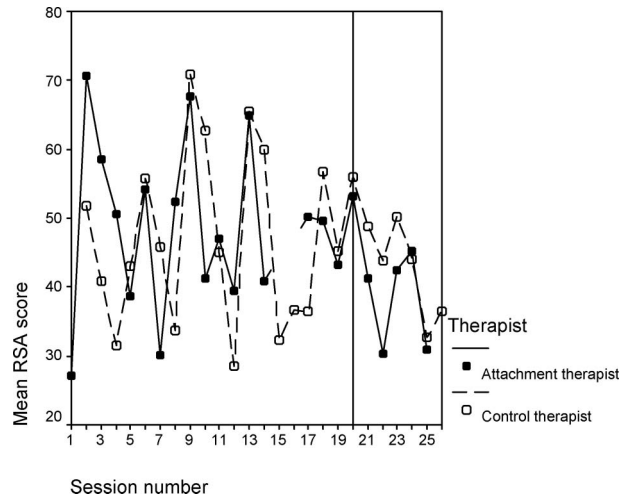


Figure 6. Mean RSA for the attachment therapy (sessions 1–17) and the behavior modification (sessions 18–24).

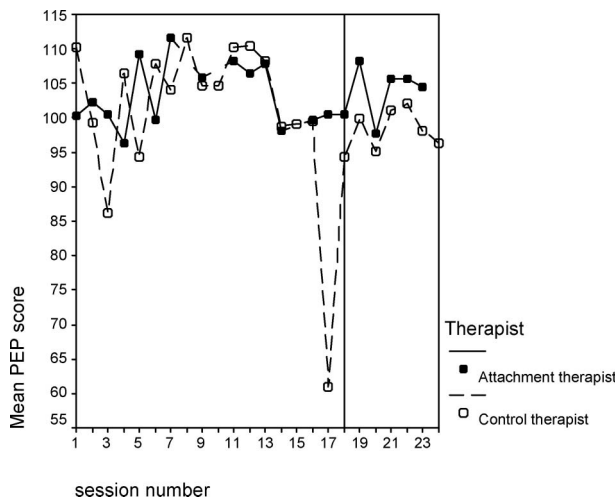


Figure 5. Mean PEP for the attachment therapy (sessions 1–17) and the behavior modification (sessions 18–24).

tested using non-parametric bootstrapping, which is why only the *p*-values are given).

Figure 6 shows the mean RSA (a lower RSA indicates more stress) per session during the integrative treatment (phase 1 and phase 2). The isotonic regression analysis and a non-parametric bootstrap with mean RSA per session on the data of the behavior modification treatment (phase 2) showed no significant difference between RSA arousal when the attachment therapist conducted the treatment ($M = 40.59$; $SD = 8.69$) and when the control therapist conducted the treatment ($M = 44.61$; $SD = 8.02$).

Discussion

In this case study, we focused on the effect of an integrative psychotherapeutic intervention and on

the components that may be responsible for positive therapy effects. Firstly, we determined changes during treatment in Roy's challenging behavior. Second, behavior modification by an attachment therapist and a control therapist were compared. Third, the therapeutic relationship was examined to determine if the attachment therapy gave more way to attachment behavior by the client than the sessions with the control therapist and whether autonomic reactivity provided evidence for more effective affect regulation during contact with the attachment therapist than with the control therapist.

The results suggested that the treatment was beneficial as Roy, over time, showed significantly less frequent and less intensely challenging behavior even outside the therapy situation. His formerly very resistant challenging behavior decreased markedly during the attachment therapy (phase 1) and continued decreasing during behavior modification (phase 2). The results also indicated that the attachment therapist was significantly more effective in teaching Roy new appropriate behavior in the behavior modification phase of the integrative therapy. It should be noted that both therapists were compared using social contingencies of similar quality and strength. The difference may be that the client *experienced* social contingencies from the attachment therapist as stronger or qualitatively more salient than the same contingencies coming from the control therapist. Therefore the attachment phase might be a positive augmentation to enhance the effectiveness of behavioral interventions, such as differential reinforcement and Functional Communication Training. Furthermore, the decrease in challenging behavior was so rapid and extensive during the attachment therapy that the target challenging behavior rarely occurred during the behavior modification sessions,

such that behavior modification could mainly focus on teaching new appropriate and functionally communicative behaviors.

Observations during the sessions revealed that Roy showed significantly more proximity-seeking behavior towards the attachment therapist than towards the control therapist. The intensity of this behavior increased over time. The client rarely exhibited resistant and avoidant attachment behaviors, but when he did it was more towards the attachment therapist than towards the control therapist. It should be noted that before the therapy, proximity to caregivers resulted in aggressive behavior and spitting.

In addition to behavioral changes as evidence for the development of attachment, we also inferred intra-psychic changes. Although little is known about the association between measures of autonomic arousal and subjective affective experience in persons with severe or profound ID, on the basis of research on people without an intellectual impairment the decrease found in autonomic activity during contact with the attachment therapist may be interpreted as an increase in regulation of affect and an increase in well-being [4]. Additional evidence for the effect of the therapy on affect regulation was found during phase 2, when sessions were conducted under conditions that before the therapy would have provoked challenging behavior. Roy showed less PEP arousal when the attachment therapist rather than the control therapist conducted the behavior modification therapy. One interpretation could be that the attachment therapist had become more sensitive to Roy's distress signals, which made the intervention less stressful. However, the behavior modification protocol was highly structured and explicit in order to safeguard comparability of the intervention as conducted by the two therapists. It is more likely that the lower level of arousal can be explained by Roy having learned to derive stress relief from having the attachment therapist in close proximity.

Although a reaction was expected on PEP *as well as* RSA, the results indicated that the parasympathetic system (RSA) was not differentially activated. According to Porges' model of a social engagement system [30], the parasympathetic system is activated when situations involve non-threatening challenges of homeostasis (e.g., focused attention or social interactions). Consequently, the result of parasympathetic activation is, without activating the sympathetic nervous system, a down-regulation of the vagal system due to the rapid increase of cardiac output (decrease in RSA) [30]. Roy used the sympathetic system (PEP) to react to the therapists' provocative behavior. The sympathetic nervous system mediates fight-flight reactions, which are

usually shown in cases where homeostasis is more severely under threat than during normal social interactions. This might indicate that the sweets and the music he preferred were highly important items. Food and auditory stimulations may be essential elements in the lives of blind and severely impaired children.

During the generalization phase of the intervention special attention was given to enhance the relationship with the client. Furthermore, an important aspect was to provide a setting, which supports the expression of preferences and stimulates making choices. Therefore, this intervention may be an important step towards giving the client the possibility of attaining some degree of self-determination. More self-determination is important to give the client a feeling of control in their life and thus to improve the quality of life [31].

The results indicated that the integrative treatment was effective, and that this effect may be due to the fact that the client was allowed to develop an attachment relationship with a therapist and learned to use this therapist as an external regulator of stress. As with the treatment described by Fisher et al. [20], this integrative treatment starting with an attachment-based intervention also led to changes in the individual-level processes, which might have been carried into other situations as well. The expectation is, therefore, that the treatment will have a long-term effect.

The attachment therapist proved to be more effective than the control therapist in teaching the client new appropriate behavior. This finding supports the importance of the use of an integrative treatment and is consistent with the stress-attachment model developed by Jansen et al. [1]. Whether these findings may be generalized to children other than Roy awaits further research.

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