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Therapist alliance building behavior and treatment adherence for dutch children with mild intellectual disability or borderline intellectual functioning and externalizing problem behavior

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ABSTRACT

Background: Psychological interventions targeting children with mild intellectual disability or borderline intellectual functioning (MID-BIF) are suggested to be effective in reducing their externalizing problem behavior, but less is known about the specific treatment processes that may be associated with these effects.

Aims: The current study investigated whether the treatment processes of observed treatment adherence (i.e., the degree to which a therapist sticks to the protocol of a treatment and provides the treatment as intended) and observed therapist alliance-building behavior (TA-BB; i.e., behavior contributing to the affective bond between the therapist and the client) predicted treatment outcomes in a group behavioral parent training combined with group child cognitive behavior therapy targeting externalizing problem behavior in children with MID-BIF.

Methods and procedures: Seventy-two children (aged 9–18; $M_{\text{age}} = 12.1$) and their parents in the Netherlands received the intervention program. They reported on children's externalizing behavior, parenting practices and the parent-child relationship by questionnaires at pre-test and post-test, and the observed treatment processes were coded by audio tapes of therapeutic sessions. **Outcomes and results:** The results showed high levels of both treatment adherence ($M = 2.49$; $SD = 0.20$; range 1–3) and TA-BB ($M = 4.11$; $SD = 0.32$; range 1–5). Additionally, repeated measures analyses revealed that levels of treatment adherence significantly predicted the improvement of the parent-child relationship ($F(1, 66) = 5.37$; $p = .024$) and that levels of TA-BB significantly predicted the decrease of parent reported externalizing problem behavior ($F(1, 66) = 9.89$; $p = .002$).

Conclusions and implications: The current study suggested that optimal treatment processes are important for treatment outcomes in an intervention targeting children with MID-BIF.

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1. Introduction

Over the years, clear evidence has been reported on the effectiveness of interventions targeting problem behaviors in youth with mild intellectual disability or borderline intellectual functioning (MID-BIF; IQ 55–85 and limited adaptive functioning). This research is essential, as this group develops three to four times more problem behavior than their peers without an intellectual disability (Dekker, Koot, Van der Ende, & Verhulst, 2002). Multiple review studies and meta-analyses have indicated promising levels of effectiveness of behavioral interventions targeting externalizing problem behavior in individuals with MID-BIF (Einfeld, Tonge, & Clarke, 2013; Heyvaert, Maes, & Onghena, 2010). However, the conclusions of these empirical studies need to be interpreted carefully, because they are oftentimes based on small samples and poor study designs (e.g., pre-posttest designs without control group). Moreover, the majority of interventions target an adult population, and interventions targeting problem behavior in children is limited.

Therefore, researchers expressed the need for larger randomized controlled trials (RCTs), in order to assess treatment for children with MID-BIF and externalizing problem behavior (Einfeld et al., 2013). A response to this call is the RCT ($N = 169$) of Schuiringa, Van Nieuwenhuijzen, Orobio de Castro, Lochman, and Matthys (2017). In their evaluation of the intervention “Standing Strong Together” (SST), a multi-component group-based intervention for children with MID-BIF and their parents, they suggested its effectiveness on externalizing problem behavior in children, parenting skills and the parent-child relationship. However, researchers have also expressed the need for a more thorough and in-depth analysis of the working mechanisms of these interventions: understanding *how* interventions work, rather than concluding *that* they work (Heyvaert et al., 2010; La Greca, Silverman, & Lochman, 2009; Willner, 2005). It is important to understand which treatment processes are responsible for intervention outcomes, as they might be the key to improving best practice for individuals with MID-BIF and they could facilitate the feasibility of the intervention (Kazdin, 2009). Moreover, understanding treatment processes in group-based interventions is of great importance, as these processes have an impact on multiple participants at the same time, in contrast to individual treatments (Ardito & Rabellino, 2011).

Understanding treatment processes might be especially important for interventions targeting children with MID-BIF, as children with MID-BIF more often have less communication skills and more difficulties in social information processing (Jahoda, Dagnan, Stenfert Kroese, Pert, & Trower, 2009; Van Nieuwenhuijzen, Orobio de Castro, Wijnroks, Vermeer, & Matthys, 2004). As a result, children can have limited social skills and limited skills in linking events, thoughts and emotions, which could complicate the relationship formation between the therapist and the child, and participation in a group-based treatment in general. To be able to provide accurate and effective interventions for children with MID-BIF, investigating treatment processes in these interventions is therefore crucial. With more information on treatment processes, therapists can alter their behavior in a way that benefits the treatment processes, increasing effectiveness of the treatment provided. As it is still unknown which treatment processes play a role in the effectiveness of interventions for this specific target group, the current study examined two treatment processes in an intervention targeting problem behavior in children with MID-BIF.

1.1. Treatment processes

In intervention research, treatment processes are classified under two categories. Firstly, technical treatment processes refer to treatment content derived from a theoretical framework. These technical treatment processes are assumed (and developed) to be the working mechanisms within the intervention, and effective exposure to the treatment content is associated with treatment effectiveness (Imel & Wampold, 2008). Effective exposure is measured by *treatment adherence*, one component of treatment integrity (Perepletchikova & Kazdin, 2005). Treatment adherence is the degree to which a therapist sticks to the protocol of a treatment and provides the treatment as intended (Perepletchikova, 2011). Since higher treatment adherence was found to be essential in treatment effectiveness (Perepletchikova & Kazdin, 2005), examining and improving treatment adherence is suggested to be important in optimizing manualized treatments, but may be difficult in group-based interventions for children with MID-BIF.

Secondly, a growing body of research suggests that relational treatment processes are important in treatment effectiveness (Messer & Wampold, 2002). A relational treatment process that is suggested to be essential in optimizing outcomes in psychological treatment is the *therapeutic alliance*. A vast number of studies concluded that the alliance between the therapist and the client is one of the most important predictors of treatment outcomes (Ardito & Rabellino, 2011; Green, 2006; Shirk, Karver, & Brown, 2011; Welmers-Van de Poll et al., 2018). Specifically, the affective bond between the therapist and the client, and the agreement on and involvement in tasks are important predictors of effectiveness of parent training programs for children with externalizing problems (Matthys & Lochman, 2017). Therapeutic alliance was found to predict positive parenting practices (Kazdin & Whitley M.K., 2006) and a decrease in children’s problem behavior in treatments (Kazdin & McWhinney, 2018; Kazdin, Whitley, & Marciano. et al., 2006). The therapeutic alliance was even suggested to explain more of the outcome variability than the specific content of a treatment might explain (Messer & Wampold, 2002).

In the study of both treatment adherence and therapeutic alliance, often therapists’ or clients’ self-reports on treatment sessions are used. A limitation of these measures is that they are subject to bias and personal and contextual characteristics of the examined agents (Creed & Kendall, 2005). Observing the behavior of the therapist that is associated with treatment adherence or therapeutic alliance, by rigorously trained raters, can overcome this subjectivity (Herschell, Quetsch, & Kolko, 2020; Perepletchikova & Kazdin, 2005). And although the use of observations has been a standard in the measurement of treatment adherence, and more common in the actual observable relationship between the therapist and a child or parent (e.g., Liber et al., 2010; McLeod & Weisz, 2005; Mitchell et al., 2021), there are very few studies that used observational measures in the study of the therapeutic alliance (Creed & Kendall, 2005). It is however suggested that observable therapist alliance-building behavior is important for, and associated with, therapeutic alliance in

psychotherapy (Karver et al., 2008). Using observational measures of therapeutic alliance in research including individuals with MID-BIF is particularly valuable, as individuals with MID-BIF find it complicated to report on the relationship they have with their therapist (Evans & Randle-Phillips, 2018). Therefore, the current study adopted observational measures in the investigation of both treatment adherence and therapeutic alliance. Observable behavior of the therapist that is associated with therapeutic alliance is oftentimes referred to as therapist alliance-building behavior (TA-BB), a term which will also be used in the current article.

1.2. The present study

The present study examined both observed technical treatment processes (treatment adherence) and observed relational treatment processes (TA-BB) within an intervention targeting externalizing problem behavior in children with MID-BIF. “Standing Strong Together” (SST) is a manualized group behavioral parent management training combined with group child cognitive behavior therapy (Schuiringa et al., 2017; Van `t Hof et al., 2014). The intervention targets parenting skills in therapeutic group sessions for parents, as well as problem solving and social skills of their children with MID-BIF in separate, parallel group sessions. The inclusion of parents in an intervention targeting children’s externalizing problem behavior has received ample theoretical and empirical support and is therefore a strength of SST (Schuiringa, Van Nieuwenhuijzen, Orobio de Castro, & Matthys, 2015). In the study evaluating SST, children were cluster randomly assigned to SST combined with care as usual or to care as usual only. SST led to a significant benefit on teacher reported but not on parent reported externalizing behavior. SST had significant effects on parent rated positive parenting and the parent-child relationship (Schuiringa et al., 2017).

In the present study, we aimed to investigate whether treatment processes would predict beneficial treatment outcomes for children with MID-BIF and their parents. We examined whether the observed TA-BB and *treatment adherence* affected the intervention outcomes by observing these factors in therapeutic sessions. Based on previous research on the predictive effect of these treatment processes, we expected that both treatment processes would predict more positive intervention outcomes (Karver, De Nadai, Monahan, & Shirk, 2018; Perepletchikova & Kazdin, 2005). Specifically, we expected that higher levels of treatment processes were associated with a higher decrease in externalizing problem behavior in children with MID-BIF after the intervention, and a higher increase in quality of parenting skills and the parent-child relationship after participation in the intervention. Thus, we expected both treatment processes to affect all treatment outcomes.

By examining these research questions, we aimed to map the events during an intervention targeting externalizing problem behavior in children with MID-BIF. In this way we aimed to reveal treatment mechanisms through which this intervention functions, and through which it can be optimized.

2. Method

2.1. Procedure

Data in the current study were obtained from a Randomized Controlled Trial (RCT) from Schuiringa et al. (see Schuiringa et al., 2017 for a detailed description of the procedure). In their study, the intervention SST was implemented in twelve treatment centers for children with MID-BIF and externalizing behavior, which were located across The Netherlands. Three to five families on each location were recruited based on the following inclusion criteria: (1) children scored above the 90th percentile on the externalizing behavior subscale of the Child Behavior Checklist (CBCL, see 2.5. Measures), (2) they were living at home with their family, (3) families could communicate in Dutch, (4) absence of psychosis in parents, absence of hearing or visual problems in children or parents that could interfere with the perception of the intervention, (5) absence of autism spectrum disorder diagnosis in children, as the intervention does not target this diagnosis. In the treatment centers where the study took place it was assumed that parents suffering from active psychosis (i.e., delusions, hallucinations, disorganized thinking) are insufficiently able to benefit from a behavioral parent training. In addition, it could be vulnerable in the group context of the intervention. The possible presence of a psychosis was determined by the clinicians in the treatment centers. Children with ASD were excluded as the cognitive behavioral therapy targeted deviant cognitive functions typically for children with externalizing behavior rather than for children with ASD (e.g., deviant theory of mind). To inform families about the study, information letters were handed to families by staff members of the treatment center. Additional information could be obtained from the researchers and care staff. Families who signed the informed consent were randomly assigned to the intervention or control condition. Questionnaires were completed by parents and teachers immediately before and after the intervention. Parent assessments were conducted during home visits, where the researcher posed the questions stated in the questionnaire and reported the answers from the parents. Child assessments were conducted before the intervention by a research assistant, in a separate and quiet room at the child’s school. Families received a gift as a compensation for their participation. Teacher measures were returned by mail. Therapists audio taped all the therapeutic sessions. In the current study, these audio tapes were coded on treatment adherence and TA-BB to collect data on treatment processes. The study was approved by the medical Ethical Committee of the participating university (CCMO no. 08/249).

The current study used a sample of 97 families, who were allocated to the intervention condition in the study of Schuiringa et al. (2017). The data from participants who were allocated to the control condition in the RCT were not used, as these participants received care as usual and did not participate in an intervention program. Thus, treatment processes could not be observed in this group and these data were therefore not informative to answer our research questions. Five families did not start the intervention program. Moreover, twenty families had missing values on essential variables, and so data was used of 72 families. For a more detailed description of the allocation and attrition flow of participants, we refer to Schuiringa et al. (2017).

2.2. Participants

Seventy-two Dutch families with a child with MID-BIF, aged 9–16 ($M = 12.1$; $SD = 1.9$) were randomly assigned to the intervention SST. Children lived at home with their parents or legal caregivers and received outpatient care or day-care treatment from the treatment centers. Their diagnosis of MID-BIF entailed that they had limited adaptive and cognitive functioning (i.e., IQ scores ranging from 55 to 85; AAIDD, 2010; APA, 2013).

The majority of the children in the current sample was male (80.6 %). The average IQ score of the current sample was 74.9 ($SD = 11.02$). Parent reports were completed by both parents together (16.7 %), or by the main caregiver (9.7 % fathers, 68.1 % mothers, 2.8 % other caregiver). Parents were married (31.9 %), divorced (23.6 %), cohabiting (9.7 %), single (27.8%) or together with another partner than the other parent of the child (5.6 %). Of the parents, the majority was of a Dutch origin and the minority was diversely represented (Table 1). Socioeconomic status (SES) was coded on a 10-point scale of educational levels of the parents. The average SES of the participating families was 4.3, which corresponds with a parental educational level of lower vocational education.

2.3. The intervention

Standing Strong Together (SST; Van 't Hof et al., 2014) is a manualized, behavioral parent training combined with child cognitive behavioral therapy and is based on the Utrecht Coping Power Program (Van de Wiel et al., 2007). An elaborate description of the intervention is provided in Schuiringa et al. (2017). The intervention was provided by a group leader (parent and child sessions), a social worker (parent sessions) and a therapist (child sessions). Families were distributed amongst 20 child-groups and 20 parent-groups. Both parent and child sessions began with a retrospect to the previous session and the parent's or the child's experiences of using the acquired skills during the previous (two) week(s). The manual of the intervention contained a structured description of the sessions and included: (1) goals of the session, (2) necessities, (3) session overview, (4) separate descriptions of session components (concrete exercises, explanations, instructions and input for discussion) and (5) things to provide at the end of the session (e.g., summary, homework). The themes of the specific session components of the intervention were timed in a parallel manner for parents and children.

Twelve weekly child sessions, consisting of three to five children, lasted 75 min and were given during school hours or day care hours at the treatment center. The sessions focused on recognizing feelings, anger management, problem definition, understanding of other person's intentions, problem solving, and peer pressure. The themes that were covered are: (1) acquaintance, (2) communication, (3) everyone is unique, (4) helping thoughts, (5) recognizing different emotions, (6) feelings of anger, (7) handling various degrees of anger, (8) social problem solving, (9) handling bullying, (10) collaborate with other children, (11) handling peer pressure, (12) ending and summarizing. All themes were implemented in the sessions by role-play, videotapes and games in order to practice the different skills.

The intervention for parents consisted of ten 90-minute sessions every other week and were scheduled in consultation with parents and the treatment centers. The parent intervention focused on improving parenting skills by the following components: (1) acquaintance and psycho-education, (2) structure and rules, (3) instructions, (4) praise, (5) use of reward, (6) ignoring, (7) boundaries and time out, (8) loss of privileges, (9) helping thoughts, (10) receiving support.

2.4. Clinical staff training

Clinicians at treatment centers were trained to become a certified SST trainer. These clinicians had varying functions at the treatment centers (i.e., therapist, family support worker, or social worker). Clinical staff training consisted of a one-day training course provided by the developers of the intervention. The training included explanation of the theoretical background of the intervention, explanation of the relevance of following the protocol, practical tips for implementation and practicing exercises from the protocol by role-plays. Themes that were practiced during these role-plays were: introducing exercises from the protocol, motivating parents to engage in a role-play, creating a safe atmosphere during the first session, distributing attention amongst all participants, and increasing desirable behavior and decreasing undesirable behavior. During the intervention period, SST trainers participated in two supervision meetings with all trainers and two train-the-trainers, who were also involved in the development of the intervention.

Table 1
Origin of parents of families participating in the intervention program.

Origin	% Mothers	% Fathers
Dutch	79.2	70.8
Antillean	5.6	4.2
Moroccan	4.2	4.2
Surinamese	4.2	8.5
Turkish	1.4	4.2
Other	4.2	7.0

2.5. Measures

The two treatment processes were observed from audio recordings of the therapeutic sessions. Both the parent and child sessions were coded, and an average score of both sessions was calculated to provide the total exposure of the treatment process to the family. Treatment adherence was coded by one coder (research assistant) who was thoroughly trained to observe treatment adherence. As this measure is concrete and factual and does not involve subjective interpretation, coding the audio tapes by one coder was assumed to be sufficient. In contrast, TA-BB is a construct that is more receptive to subjectivity, and so the data were coded by three coders. Of all videotapes, 89 % was coded by three coders to estimate inter-rater reliability. The codes of the rater with the highest inter-rater reliability with other coders were used in the analyses. This means that codes of TA-BB with a reliability between $r = 0.73 - 0.97$ were included in the current study. All coders were not involved in the intervention, were not personally familiar with the therapists, and were blind to the research hypotheses of the current study.

2.5.1. Observed treatment adherence

Observed treatment adherence was measured by coding of the therapist's behavior in audio taped child and parent sessions. Different sessions for different groups were chosen to be coded, to gain a comprehensive image of treatment adherence throughout the implementation of the intervention (Webb, DeRubeis, & Barber, 2010). A selection of sessions was coded, as coding all sessions (600 h) would have been too time consuming. The coding scheme used in the current study assessed the treatment adherence of the therapist to the protocol, and was based on the coding procedures that were initially used in research on the Coping Power program (Lochman, Wells, & Lenhart, 2008; Wells, Lochman, & Lenhart, 2008). Firstly, the coder had to indicate whether the intended goals of the specific therapeutic sessions were implemented (1 = *totally not achieved* to 3 = *totally achieved*). The number of items could slightly differ between sessions, depending on the number of goals per session in the protocol. Secondly, the coder had to indicate whether the general treatment components (i.e., (1) discussing homework of previous session, (2) discussing new homework, (3) assignment in session, (4) positive reward (in child session)) and whether the specific session exercises were executed or not. The first two items concern the discussion of the content of the homework, but scores did not depend on whether or not children or parents did their homework. These items were coded as 1 = *not present at all* to 3 = *totally present*. Lastly, four items assessed whether the quality of the session corresponded to the content and quality of the protocol (e.g., "The session proceeds in an orderly manner."). The coder answered these questions with answer categories ranging from (1 =) *not at all* to (3 =) *very often*. The adherence items are very concrete and include factual information about the sessions, (i.e., is an exercise from the protocol implemented or omitted), leaving very little room for interpretation by the coder. Scores of the child sessions and parent sessions were combined in order to measure family exposure to treatment adherence. The reliability of the total scale was sufficient with a Cronbach's alpha of .80.

2.5.2. Observed TA-BB

Observed TA-BB was also measured by coding the therapist's behavior in the audio taped sessions. Coding was executed by a research employee and two research assistants, who coded one session in the middle of the intervention. Preferably session five was scored, and session six when session five was not available (e.g., due to objection of a parent or child participating in the session when sharing something personal, or technical difficulties with recording). Alliance was expected to be established after several sessions, and therefore choosing a session at the beginning of the intervention, or different sessions for different trainers, would not yield a representative or comparable image of the TA-BB. The measure was inspired by existing measures (e.g., McLeod & Weisz, 2005), however, existing measures were not directly suitable for the treatment structure and audio recordings in the current study. In order to match the protocolized group-based behavioral parent training and child cognitive behavioral therapy, a corresponding instrument was developed. An exploratory factor analysis was performed to test whether the construct validity of the measure was in order. Two items did not have substantial factor loadings on the scale (i.e., *explaining importance* and *preparation of the session*). These items may have been too much associated with executing the treatment protocol, rather than TA-BB, so these items were excluded from the scale. In addition, separate items for the child and parent sessions were coded, as these sessions slightly differed in their structure. See supplementary material for an overview of these items. Items were rated by the coder on answer categories ranging from (1 =) *not at all* to (5 =) *very often*. The families received a total mean score on TA-BB, as the current study examines the exposure of the entire family to TA-BB. This total scale was considered reliable, with a Cronbach's alpha of .69.

2.5.3. Externalizing problem behavior

Children's externalizing problem behavior was rated by multiple informants: parents and teachers. Parents reported on the externalizing behavior subscale of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). Parents had to indicate on 35 items whether the problem behavior occurred (0 =) *never* to (2 =) *always*. The reliability of the CBCL was .89 at pre-test and .87 at post-test. Teachers reported on the externalizing behavior subscale of the Teacher's Report Form (TRF; Achenbach & Rescorla, 2001) by indicating on 32 items whether the behavior occurred (0 =) *never* to (2 =) *always*. The reliability of this scale was high for the sample in the current study (Cronbach's alpha .95 at pre- and post-test).

2.5.4. Parenting skills

Parenting skills were measured by the Dutch translation of the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996). Its scales of Parental involvement, Positive Parenting, (poor) Monitoring, and Positive Discipline were combined into a Positive Parenting scale. The lack of a Rule Setting subscale in the APQ led to an adoption of this subscale from the Ghent Parental Behavior Scale (GPBS; Van Leeuwen & Vermulst, 2004). The Physical Punishment scale of the APQ and the Harsh Punishment scale from the

GPBS were combined into a Negative Parenting scale. Parents had to indicate whether they applied the stated (positive or negative) parenting skill on a scale ranging from (0 =) *never* to (4 =) *always*. Cronbach's alphas for the Positive Parenting scale (36 items) at pre- and post-test was .82, which is high. For the Negative Parenting scale (6 items), Cronbach's alphas were .75 at pre-test and .72 at post-test.

2.5.5. Parent-child relationship

The parent-child relationship was measured with subscales of the Dutch version of the Parenting Stress Index (PSI; Abidin, 1983): Perceived Competence, Parent-Child Attachment and Acceptance. Parents had to indicate on 19 items to what degree the statement corresponded with their own feelings (ranging from 1 = *strongly disagree* to 4 = *strongly agree*). The scale included statements such as: "I have a hard time understanding the needs of my child". Reliability of the scale was high: .80 at pre-test and .82 at post-test.

2.5.6. Intelligence

Intelligence of the children (expressed by IQ scores) was measured by the Vocabulary and Block Design subtests from the Dutch version of the Wechsler Intelligence Scale – third edition (WISC-III; Kort et al., 2005). These subtests are known to have a high correlation with the total scores of the WISC-III and have been previously used to measure intelligence in children with MID-BIF (Silverstein, 1970; Van Nieuwenhuijzen & Vriens, 2012).

2.6. Data analyses

Data entry, preparation, and analyses were conducted in SPSS Statistics 25. Elaborate information about data entry and preparation is provided in Schuiringa et al. (2017). Their missing value analysis concluded that parent reported data were missing completely at random (MCAR), and they handled these missing scale scores by imputation using the Expectation Maximization algorithm. Teacher data were not imputed, as these were not MCAR, and were instead handled by listwise deletion. In the additional data on treatment processes in the current study, there was one missing value on treatment adherence. This value was also handled by means of EM imputation, using the same procedure as Schuiringa et al. (2017). Additionally, they tested whether the multilevel structure of the data (i.e., families nested under therapeutic groups), required multilevel analyses. It was concluded that there was no significant amount of variation at the group level, and therefore the multilevel structure of the data could be ignored.

As the sample in the current study consisted of pre-existing groups, it is recommended to use a repeated measures Analysis of Covariance (ANCOVA; Van Breukelen, 2006). Therefore, multiple repeated measures ANCOVA's were carried out for each outcome measure. Gender, age, socioeconomic status, and IQ were added to the model as covariates, as they are suggested to influence treatment effects (Reyno & McGrath, 2006). In this way, we wanted to prevent these background characteristics from confounding the results. Separate repeated measures ANCOVA's were carried out including one of the two treatment processes as a predictor. F-values of the interaction between the predictor and the treatment effect over time were evaluated in order to draw conclusions about their relationship with treatment outcomes.

3. Results

3.1. Descriptive results

Means and standard deviations for all outcome measures were computed for both measurement occasions separately (i.e., pre-test and post-test; Table 2). As can be seen in Table 2, externalizing problem behavior decreased over time, according to parent and teacher reports. Additionally, scores on positive parenting and the parent-child relationship increased over time. Negative parenting skills decreased over time.

Descriptive analyses revealed that the scores on both treatment processes were relatively high. The mean scores on treatment adherence and TA-BB were skewed to the left, and so most participants had high scores on treatment processes. Participants thus received a treatment intervention with high treatment adherence to the protocol and a good TA-BB (Table 2). The high treatment

Table 2

Means, standard deviations and the results of the repeated measures ANCOVAs across all outcome scales.

	Range	Pre-test <i>M (SD)</i>	Post-test <i>M (SD)</i>	Interaction effect treatment adherence <i>F (p)</i>	Interaction effect TA-BB <i>F (p)</i>
Ext. behavior (parents)	0–2	0.66 (0.26)	0.52 (0.23)	0.37 (0.547)	9.89 (0.002)* *
Ext. behavior (teacher)	0–2	0.70 (0.44)	0.58 (0.40)	0.59 (0.447)	0.06 (0.813)
Positive Parenting	0–4	2.75 (0.38)	2.77 (0.38)	0.02 (0.880)	1.62 (0.208)
Negative Parenting	0–4	0.30 (0.42)	0.20 (0.33)	0.66 (0.843)	0.72 (0.749)
Parent-child relationship	1–4	2.81 (0.47)	3.08 (0.49)	5.37 (0.024)*	0.04 (0.840)
	Range	<i>M (SD)</i>		Min	Max
Treatment adherence	1–3	2.49 (0.20)		1.94	3.00
TA-BB	1–5	4.11 (0.32)		3.63	4.68

Note. Significant at * $p < .05$, ** $p < .01$.

adherence and high average scores on TA-BB indicate that correct implementation of the intervention was highly feasible. This skewness however did not mean that the assumption of normality was violated. Treatment adherence had a skewness of 0.39 ($SE = 0.28$) and kurtosis of 1.94 ($SE = .56$). TA-BB had a skewness of 0.44 ($SE = .28$) and a kurtosis of -0.69 ($SE = 0.56$). Although the kurtosis of treatment adherence was on the higher end, these values of skewness and kurtosis are acceptable as they are below the value of 2 (George & Mallery, 2010). The repeated measures ANCOVA's were therefore executed but results on treatment adherence should be interpreted with caution.

3.2. Observed treatment adherence

The results of the analyses regarding the prediction of treatment outcomes by treatment adherence are displayed in Table 2. The repeated measures ANCOVA revealed that, when controlling for background characteristics, treatment adherence significantly predicted the increase in scores on the measure of the parent-child relationship. So even though therapists in the whole sample adhered to the protocol sufficiently (>2), higher treatment adherence of the therapist was associated with enhanced improvement of the parent-child relationship.

3.3. Observed TA-BB

As shown in Table 2, the repeated measures ANCOVA revealed that TA-BB predicted the intervention effect significantly on one outcome measure. TA-BB significantly predicted the decrease in parent-reported externalizing problem behavior of children. This result indicated that for participants whose therapist was observed to provoke a very good alliance, the decrease in parent reported externalizing problem behavior of children was stronger.

4. Discussion

The current study aimed to examine the association of treatment adherence and TA-BB on the one hand and the treatment effect of an intervention targeting externalizing problem behavior in children with MID-BIF on the other. Receiving treatment from a therapist who is sticking to the protocol was suggested to facilitate the improvement of the parent-child relationship. The treatment process of TA-BB significantly predicted the decrease in parent-reported children's externalizing problem behavior. The treatment processes were not found to significantly predict other intervention outcomes. These results will be discussed below.

4.1. Observed treatment adherence

The average observed treatment adherence was reported to be high, indicating that the manual of the intervention was comprehensive, well thought out, and elaborate. Moreover, this result suggests that therapists provided optimal effort during the implementation of the intervention. Although this result is favorable, the limited amount of variance in the scores on treatment processes, reduced our chance to find conclusive evidence about their predictive effects. This issue has been discussed in previous research (Rapley & Loades, 2019). A significant relationship between treatment adherence and improved parent-child relationship was found, suggesting that perfecting treatment adherence is beneficial for treatment effectiveness.

The association between exposure to the protocol and improvement of the parent-child relationship during the intervention could be explained by the specific ingredients of the intervention embedded in its protocol. Measurement of parent-child relationship included items of perceived competence, attachment and acceptance as reported by parents, which all were affected by high levels of exposure to the treatment protocol. Components in the protocol specifically targeting these outcomes were psycho-education to the parent about the child's behavior and exchange of (parenting) experiences between parents (Van 't Hof et al., 2014). By the recurrent exposure to these components, parents might have felt more empowered and self-assured, which resulted in high perceived competence and acceptance of the child's behavior. The discussions during the sessions, which were strictly led by the protocol, might have had more immediate effects on the perceived competence and acceptance than on the parenting skills themselves. In addition, whereas empowerment can happen during the session, practicing accurate parenting is a skill that needs to be transferred from the session to real-life practice. Although the lack of findings of effects of treatment adherence on parenting skills is in contrast with previous research (Forgatch, Patterson, & DeGarmo, 2005), high exposure to the protocol itself might influence the parenting skills only over a longer period of time. In order to overcome this long-term transference of parenting skills to real-life practice, the treatment protocol may be optimized by including more references to real-life practice and special attention should be paid to practical exercises during treatment sessions.

4.2. Observed TA-BB

The high average scores on observed TA-BB that were found in the current study may be explained by the exposure of therapists to the clinical staff training. The attention that was paid to TA-BB in this training may have provoked sufficient levels of TA-BB. This however requires further study. The rather high scores on TA-BB, and its low variance, may have limited our power to detect a significant relationship between TA-BB and the intervention outcomes, but our analyses still revealed that higher scores on the TA-BB affected treatment outcomes.

Our findings indicate that TA-BB significantly predicted the decrease in parent-reported externalizing problem behavior of the

child, which is in line with previous research. The meta-analysis of Karver et al. (2018) suggested a modest association between therapeutic alliance and a decrease in externalizing problem behaviors in youth, with an effect size of .28. Considering the suggested association between TA-BB and therapeutic alliance (Karver et al., 2008), TA-BBs seem beneficial for treatment outcome for children with externalizing behaviors. An explanation for the enhanced changes in the behavior of children during treatment may lie in the fact that children synchronize their behaviors and emotions with the therapists (Koole & Tschacher, 2016). Elements of our measure of observed TA-BB, such as providing compliments and being optimistic, may have provided the children with an example of positive behavior. When the therapist showed this positive behavior, children were more likely to show positive behavior after the intervention themselves. This explanation of the effect of TA-BB on treatment outcome, by the synchronization in both behavior and emotions is also suggested in the psychotherapy literature (Koole & Tschacher, 2016), and in research on the effects of group therapists' positive, non-irritable behaviors on children's externalizing behavior problems (Lochman, Dishion, Boxmeyer, Powell, & Qu, 2017). TA-BB however only predicted parent-reported externalizing behavior, and not teacher-reported behavior. As mentioned in Schuiringa et al. (2017), parent's reports of externalizing behavior may be susceptible to subjectivity, especially because parents are also exposed to the intervention. They may notice the synchronization of their child's behavior, as parents experience both the TA-BB of the therapist, as well as the behaviors of their child. Moreover, teacher-reported externalizing behavior showed more variance over time, and so more factors than only TA-BB may explain the teacher-reported externalizing behavior. Also, possibly because teachers generally provide a more objective judgment of the child's behavior than parents, their judgement may be predicted by other factors than treatment processes. This complex interplay between TA-BB, therapeutic alliance and treatment outcome however requires further study.

4.3. Strengths and limitations

The current study is the first evaluation of treatment processes in behavioral parent training and child cognitive behavioral therapy for children with MID-BIF and externalizing problem behavior. Examining treatment processes for this group is crucial, as treatment processes manifest themselves differently in treatment for children with MID-BIF (Jahoda et al., 2009). The use of observations of therapist behavior is an important strength of the current study. In this way, behavior of the therapist could be evaluated objectively. Additionally, the use of multiple informants that reported on the child's externalizing problem behavior is also a strong asset of the current study.

Despite these strengths, the current study was not conducted without limitations. Firstly, our study did not include observations of client behavior. Future research should target both the therapist and the clients and in this way map treatment processes more completely. Secondly, using one coder for the assessment of treatment adherence is a limitation of the study. Thirdly, although the high levels of treatment adherence and TA-BB support feasibility of the implementation of the intervention, the lack of variance on these treatment processes might have limited our power to draw conclusions about the effects of low levels of treatment processes on treatment outcomes. More specifically, a high kurtosis on treatment adherence implies that the conclusions regarding this treatment process need to be interpreted with caution and need replication. Fourth, TA-BB was coded for one session during the parent intervention, and one session during the child intervention. Coding several sessions will enhance the internal validity of the evaluation of TA-BB.

4.4. Implications for research and clinical practice

The findings in the current study contribute to the previous, but scarce literature about observable treatment processes in parent and child-targeted interventions. It was the first study that examined therapeutic processes in treatment for children with MID-BIF. Future research could elaborate on these constructs by observing the development of the treatment processes during the treatment, as the current study only observed one treatment session. Information about the course of these processes and its interaction with client behavior may provide insight into the efficacy of these treatment processes. Future research could build on the current study by focusing on a broader range of treatment processes (e.g., therapist's competence, group dynamics). Furthermore, research could focus on the effects of low levels of treatment adherence and TA-BB on treatment outcomes, possibly providing conclusive evidence on the effects for which the current study could not provide support. In line with the observational data used to code the treatment processes in the current study, measuring externalizing behavior could be improved in the future by also using observation. It must then be carefully considered whether the methodological advantages outweigh the disadvantages, such as losing participants, as observation might be experienced as too intrusive in more vulnerable target groups. Finally, future research could study the effectiveness of additional clinical staff training focusing on improving treatment adherence and TA-BB in order to increase intervention effectiveness (e.g., Lochman et al., 2009).

The current study highlights the feasibility of high TA-BB and treatment adherence when implementing a manualized behavioral parent training combined with child cognitive behavioral therapy for children with MID-BIF. Evidently, the protocol of the intervention was easy to use and resulted in high treatment adherence, even in this hard-to-reach target group.

What this paper adds?

This study investigates how treatment processes operate in relation to treatment outcomes of a group behavioral parent training combined with group child cognitive behavior therapy targeting problem behavior in children with MID-BIF. The relational treatment process of therapist alliance-building behavior (TA-BB; i.e., behavior contributing to the affective bond between the therapist and the

client) and the technical treatment process of treatment adherence (i.e., the degree to which a therapist sticks to the protocol of a treatment and provides the treatment as intended) were observed during this intervention. These data of a multi-center randomized controlled trial supports the role of TA-BB in the decrease of externalizing problem behavior as well as the role of treatment adherence on the improvement of the parent-child relationship. Specific components of the intervention protocol and the therapeutic behavior are discussed in relation to these effects. It suggests that in order to achieve high treatment adherence (i.e., trainers adhering to the training protocol), clinical staff training is essential. The study suggests that high TA-BB is feasible in children with both MID-BIF and externalizing behavior problems and their parents.

CRediT authorship contribution statement

Aniek van Herwaarden: Conceptualization, Writing – original draft, Formal analysis. **Hilde Schuiringa:** Conceptualization, Methodology, Writing – original draft, Funding acquisition, Data curation, Investigation, Project administration. **Maroesjka van Nieuwenhuijzen:** Conceptualization, Methodology, Funding acquisition, Supervision, Writing – review & editing. **Bram Orobio de Castro:** Conceptualization, Methodology, Funding acquisition, Supervision, Writing – review & editing. **John E. Lochman:** Conceptualization, Methodology, Writing – review & editing. **Walter Matthys:** Conceptualization, Methodology, Funding acquisition, Supervision, Writing – review & editing.

Conflict of interest

The first and second author declare no conflict of interest. The third and the fourth author were involved in adapting the intervention to MID-BIF. The fifth and the sixth author were involved in adapting the intervention to MID-BIF, also being co-developers of the original intervention Coping Power and Utrecht Coping Power. None of the authors delivered the intervention and none of the authors have any direct or indirect financial interest in the intervention or the institutions where the intervention was delivered.

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Appendix A. Supporting information

Supplementary material include measures of treatment adherence and TA-BB and will be made available by the authors upon request.

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