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Comparing Alliance in Two Cognitive-Behavioural Therapies for Adolescents With ADHD Using a Randomized Controlled Trial

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Alliance is defined as the client-therapist bond and their ability to collaborate on therapeutic activities. Treatment for adolescents with ADHD is rarely studied in terms of alliance. In this study, two cognitive-behavioral treatments (CBT; one structured treatment aimed at planning skills and one less-structured solution-focused treatment, both delivered in the style of Motivational Interviewing) were compared with regard to alliance and alliance-outcome association. The influence of therapist competence on this alliance-outcome association was also evaluated. The alliance between 69 adolescents diagnosed with ADHD and their therapists was measured early in treatment, using the Therapy Process

Observational Coding System for Child Psychotherapy–Alliance scale. Observer-rated therapist competence was measured using the Motivational Interviewing Treatment Integrity scale (version 3.1.1.). Outcome variables were the adolescents' reduction in planning problems and ADHD symptoms. The alliance, and, more specifically, collaboration on therapeutic activities, was significantly higher for the more structured CBT ($p = .04$; moderate effect size). Alliance was not related to outcome in the more structured CBT, while the alliance was positively related to the reduction in planning problems in the less structured CBT. Finally, alliance was a significant mediator between therapist competence and treatment outcome for the less-structured CBT. The clarity and structure of CBT may help facilitate alliance formation for adolescents with ADHD who often have difficulty implementing structure themselves. Therapists may need to invest more in alliance formation in less structured CBT as the alliance affects outcome. Moreover, enhancing therapist competence in less structured CBT may help improve outcomes in less structured CBT, as therapist competence may impact outcome through alliance.

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A STRONG CLIENT-THERAPIST ALLIANCE (hereafter *alliance*) predicts favorable treatment outcomes for children and adolescents with internalizing and

externalizing problems (McLeod, 2011; Shirk, Karver, & Brown, 2011). Two dimensions of alliance, bond and task, are typically measured when examining the alliance in youth treatment (McLeod, 2011; Shirk et al., 2011). Bond refers to the relationship between the therapist and client while task refers to the client's engagement in activities suggested by the therapist (McLeod & Weisz, 2005). Typically, these two dimensions are combined to create the alliance, as both dimensions load on to one factor (Fjermestad, McLeod, Tully, & Liber, 2016; McLeod & Weisz, 2005). The alliance predicts outcomes for youth with anxiety disorders (Anderson et al., 2012; Fjermestad, Lerner, et al., 2016; McLeod et al., 2016), behavioral problems (Ayotte, Lanctôt, & Tourigny, 2016), depression (Labouliere, Reyes, Shirk, & Karver, 2017), and other psychological problems (Bhola & Kapur, 2013; Lange et al., 2016; Ormhaug, Jensen, Wentzel-Larsen, & Shirk, 2014; Urbanoski, Kelly, Hoepfner, & Slaymaker, 2012). However, little is known about what role the alliance plays in nonpharmacological individual treatments for adolescents with attention-deficit/hyperactivity disorder (ADHD).

Due to their motivational difficulties (Luman et al., 2005), adolescents with ADHD are at increased risk for treatment dropout (Johnson, Mellor, & Brann, 2008). Low motivation could impact alliance formation, so it is possible that the formation of a strong alliance with adolescents with ADHD may improve treatment outcomes. To our knowledge, only two studies have examined the self-reported alliance-outcome association in treatments for adolescents with ADHD (Langberg, Becker, Epstein, Vaughn, & Girio-Herrera, 2013; Langberg et al., 2016). The first study investigated the alliance-outcome association in an intervention aimed at organization, time-management, homework, and academic progression (Langberg et al., 2016) and the second provided an organizational treatment for adolescents with ADHD (Langberg et al., 2013). Both studies found that a stronger self-reported alliance predicted better treatment outcomes (Langberg et al., 2013, 2016). As these studies are the only investigations of the alliance in treatment of adolescents with ADHD, there is a clear need for research on this subject.

One potential limitation of the existing studies is both employed self-report alliance instruments (Langberg et al., 2013, 2016). Adolescents may not have fully developed the social cognitive abilities required to accurately report on the alliance relationship (Shirk & Karver, 2003). Moreover, adolescents with ADHD may not be reliable in reporting on social relationships as they tend to overestimate their own

social competence (Bourchtein, Langberg, Owens, Evans, & Perera, 2017; Volz-Sidiropoulou, Boecker, & Gauggel, 2016). Therefore, the use of an observational coding system may be better suited for objectively assessing alliance in adolescents with ADHD.

An unexplored question to date is whether the alliance may differ across treatments for adolescents with ADHD. The noted deficits in planning, organization, and motivation of adolescents with ADHD (Boyer, Geurts, Prins, & Van Der Oord, 2015; Boyer, Geurts, & Van der Oord, 2018; Langberg et al., 2016) could make establishing an alliance difficult in a less structured treatment and promote alliance formation in more structured treatments. Although in a sample of youth with internalizing disorders, Langer et al. (2011) found that the observer- and self-reported early alliance was higher in a more structured, manual-based cognitive behavioral therapy (CBT) than in the less structured usual-care condition. Thus, it may be valuable to compare alliance across treatments with different levels of structure for adolescents with ADHD (Langer et al., 2011; McLeod et al., 2016), as they could form a stronger alliance in more structured treatments.

Beyond differences in the alliance across treatments, the strength of the alliance-outcome relation may vary across different treatments for adolescents with ADHD. Unlike in the adult treatment literature, the strength of the alliance-outcome association in adolescents varies across theoretical and methodological factors, such as mode of treatment and source of alliance assessment (McLeod, 2011). These treatment characteristics may influence the strength of the alliance-outcome association for youth. Only a few studies have explored this topic in youth samples. Ormhaug et al. (2014) looked at the difference in alliance between CBT and usual care in traumatized youth. While the two groups had similar alliance scores, the alliance-outcome association was only significant in the CBT group. Given that CBT is typically more structured and focused than usual care (Smith et al., 2017), the degree of treatment structure in CBT could also impact the alliance-outcome association.

As alliance refers to the bond between the client and therapist as well as the degree to which the two can collaborate on therapeutic activities, one would expect a more competent therapist to have stronger alliance and thus potentially better treatment outcome (Fjermestad, McLeod, Tully, & Liber, 2016). However, this mediating relationship of therapist competence enhancing alliance and thereby improving treatment outcome (i.e., therapist competence improving treatment outcome via alliance),

has been understudied to date, especially in samples of youth (McLeod et al., 2018), and none have been conducted in samples of adolescents with ADHD. Studies in adults with anxiety and different psychopathology show evidence for alliance to be a mediator between the therapist's competence and treatment outcome (Despland et al., 2009; Weck et al., 2015) or find both alliance and competence to be predictors of outcome (mediation was not tested; Haug et al., 2016).

In the current study, we explore the potential differential effect of alliance in two CBTs for adolescents with ADHD: a planning-focused treatment (Plan my Life; PML) and a Solution-Focused Treatment (SFT), using the Therapy Process Observational Coding System for Child Psychotherapy–Alliance Scale (TPOCS-A; McLeod & Weisz, 2005). A large-scale randomized clinical trial showed that both treatments were equally effective in reducing planning difficulties and ADHD symptoms (Boyer et al., 2015). While the two treatments have similarities, they also differ in terms of structure and topic, with PML being a treatment with structured, fixed topics around planning skills and SFT being a treatment in which the adolescent chooses which topic to discuss. This difference in structure and focus could differentially impact the quality of the alliance between the therapist and adolescents with ADHD.

Our first aim is examining the difference in alliance between SFT and PML. We expect a difference in alliance between SFT and PML favouring PML given the more rigid structure. The second aim is investigating whether alliance differentially predicts treatment outcomes for adolescents receiving SFT as compared to PML. Given that the alliance-outcome association has been stronger in more structured treatments (see Ormhaug et al., 2014), the degree of structure and focus in CBT may also impact the alliance-outcome association. Further, we control for alternative explanations that could account for the relation between alliance and improved treatment outcomes used in previous research (i.e., severity of ADHD and ODD/CD, anxiety and depression symptoms; Boyer et al., 2016; McLeod & Weisz, 2005; Van den Hoofdakker et al., 2010; Van der Oord & Daley, 2015). The third exploratory aim is investigating whether alliance is a mediator between the therapist's competence and outcome.

Method

PARTICIPANTS

The treatment study was advertised at 16 mental health care institutes in the Netherlands. Interested adolescents and their parents applied. For inclusion, adolescents had to meet the following criteria: (1) a prior DSM-IV-TR diagnosis of ADHD (APA,

2000) by a child psychiatrist or certified psychologist, (2) confirmed ADHD diagnosis on the ADHD sections of the Diagnostic Interview Schedule for Children for DSM-IV parent version (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DISC-IV is a structured diagnostic interview based on DSM-IV, which establishes ADHD group membership based on a diagnostic algorithm, including a check for the presence of cross-situational impairment, (3) aged between 12 and 17 years old, (4) attending secondary school, (5) sufficient understanding of the Dutch language (adolescents and parents), (6) a full scale IQ (FSIQ) > 80 measured by the short version of the Dutch Wechsler Intelligence Scale for Children (WISC-III; Kort et al., 2005), or (7) if applicable, the dose and type of ADHD medication had to be stable four weeks prior to pretesting. Last, adolescents were requested not to change their medication status or dosage between pre- and postassessment. Participants on methylphenidate discontinued medication at least 24 hours before assessments, allowing for complete wash-out (Greenhill, 1998). Adolescents were excluded if they: (1) received alternative behavioral therapy between pre- and postassessment, (2) had a comorbid autism spectrum disorder, (3) had a predominant addiction, depression with suicidal ideations, acute familial crisis or CD, or (4) received Atomoxetine (for more details see Boyer et al., 2015).

For the current study, videotapes from the 159 participants were used. Before the start of the study, all participants were randomly assigned to have three of their sessions videotaped, with the main purpose of assessing treatment compliance. For each adolescent in the large RCT study, 3 sessions were videotaped: one from early (sessions 1, 2 or 3), mid (sessions 4, 5, 6 or 7), and late (sessions 8, 9 or 10) treatment. Tapes from the early sessions were taken, as we were interested in early alliance; however, tapes from session 1 were not rated for alliance due to each treatment having identical first sessions, which resulted in a sample of $N = 69$ ($n = 40$ session 2; $n = 29$ session 3; Figure 1). Videotapes of all adolescents that were preassigned to have session 2 or 3 videotaped were available (thus there were no missing data). As in most studies we examined early alliance, to ensure that the alliance is not confounded with improved treatment outcome (Feeley, DeRubeis, & Gelfand, 1999; Judd & Kenny, 1981). There were no significant differences in baseline characteristics and other relevant variables between the current sample and the parent study (Supplementary Table 2).

Adolescents

Of the 69 adolescents, 72% were male, 72% of the inattentive type, 6% the hyperactive/impulsive type

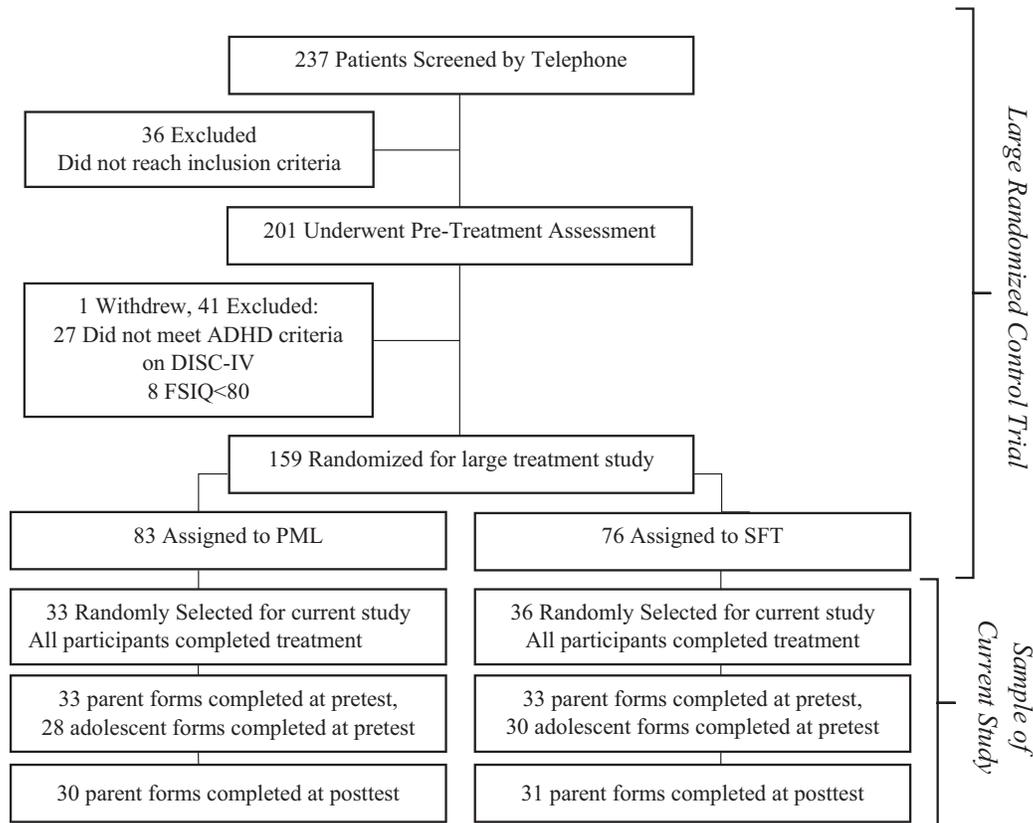


FIGURE 1 Flow chart of participant selection process.

and 22% the combined type, 83% of the adolescents were taking medication for their ADHD, with no significant differences amongst treatments (Table 1).

Therapists

Forty-one therapists working in 15 different institutions ranging in experience from 0.8 to 25 years ($M = 1.68$, $SD = 0.79$) were involved; 12 therapists provided PML, 17 therapists provided SFT, and 12 therapists provided both. The therapists treated one to four adolescents ($M = 1.68$, $SD = 0.79$).

PROCEDURE

The Ethics Committee of the University of Amsterdam (2010-KP-1079) approved the study. After participants applied, inclusion criteria were checked with an extensive phone screening. Before pretest, both parent and adolescent gave their oral and written informed consent. After pretest, adolescents were randomly assigned to either PML ($n = 83$) or SFT ($n = 76$) using covariate adaptive randomization stratified by gender and medication use (yes or no) (Taves, 1974) by a blinded and independent researcher. Posttest took place within a week after treatment by blinded research assistants.

TREATMENTS

Similarities

Both PML and SFT consisted of 10 sessions ($n = 8$ adolescent; $n = 2$ parent), 45 minutes long. The parental sessions were planned between the adolescent's session 2 and 3 as well as session 5 and 6. Both treatments used a workbook and the first session involved psychoeducation and formulating treatment goals. To reduce dropout, Motivational Interviewing (MI) was integrated into the treatments (and workbooks) in several ways:

1. The adolescents chose their own treatment goals in the first +/- 10 minutes of each session.
2. Medication use (when relevant) and school attitude were explored on scales in an MI manner.
3. Assignments were formulated as an experiment of the upcoming week and the adolescent was then free to choose a treatment strategy that suited his/her life.
4. After each session, the adolescent evaluated the session using four visual analogue scales.
5. In case of low motivation, MI was conducted by discussing the pros and cons of the treatment.

Table 1
Sample Description of Baseline Characteristics, Primary Outcomes, Control Variables and alliance

| | PML (<i>n</i> = 33) | SFT (<i>n</i> = 36) | | | |
|--------------------------------------|----------------------------|----------------------------|----------------------------------|----------|-----------|
| | <i>M/n</i> (<i>SD</i> /%) | <i>M/n</i> (<i>SD</i> /%) | <i>t</i> / <i>χ</i> ² | <i>p</i> | <i>ES</i> |
| Age in years | 14.54 (1.24) | 14.28 (1.19) | 0.86 | .39 | .21 |
| Gender (boys) | 24 (72.72) | 26 (72.22) | .05 | .82 | 0 |
| Father's highest completed edu. | | | 8.36 | .04* | .36 |
| Low | 1 (3.03) | 1 (2.78) | | | |
| Average | 1 (3.03) | 10 (27.78) | | | |
| Higher | 14 (42.42) | 9 (25.00) | | | |
| Highest | 14 (42.42) | 13 (36.11) | | | |
| Mother's highest completed edu. | | | 3.33 | .34 | .22 |
| Low | 0 (0) | 3 (8.33) | | | |
| Average | 6 (18.18) | 6 (16.67) | | | |
| Higher | 17 (51.52) | 15 (41.67) | | | |
| Highest | 9 (27.27) | 12 (33.33) | | | |
| FSIQ | 101.91 (11.20) | 104.03 (10.78) | 0.80 | .43 | .19 |
| ADHD Subtype (DISC-IV) | | | 0.47 | .79 | .08 |
| ADHD-Inattentive | 25 (75.76) | 25 (69.44) | | | |
| ADHD-Hyperactive/impulsive | 2 (6.06) | 2 (5.56) | | | |
| ADHD-Combined | 6 (18.18) | 9 (25.00) | | | |
| Medication Status | | | 1.25 | .26 | .17 |
| <i>n</i> no medication | 8 (24.24) | 4 (11.11) | | | |
| <i>n</i> taking medication | 25 (75.76) | 32 (88.89) | | | |
| Treatment characteristics | | | | | |
| Years of experience of the therapist | 4.86 (5.28) | 5.86 (5.61) | 0.76 | .45 | .18 |
| Length of treatment in weeks | 9.18 (1.99) | 9.44 (3.21) | 0.40 | .69 | .10 |
| Competence Total Score | 20.79 (3.38) | 20.04 (4.67) | 0.75 | .45 | .18 |
| Evocation | 4.20 (0.74) | 4.22 (0.97) | -0.12 | .90 | .02 |
| Collaboration | 4.06 (0.72) | 3.83 (1.03) | 1.06 | .30 | .26 |
| Autonomy | 4.20 (0.79) | 4.00 (0.99) | 0.91 | .37 | .22 |
| Empathy | 4.11 (0.78) | 4.00 (1.01) | 0.49 | .63 | .12 |
| Skill | 4.23 (0.67) | 3.99 (0.95) | 1.20 | .23 | .29 |
| Outcome measures | | | | | |
| Planning problems | 28.03 (4.23) | 28.68 (3.74) | 0.68 | .50 | .16 |
| ADHD symptoms | 24.39 (9.51) | 23.78 (8.83) | 0.28 | .78 | .07 |
| Total Alliance | 15.20 (2.79) | 13.76 (2.76) | 2.14 | .04* | .52 |
| Bond dimension | 8.35 (2.06) | 7.78 (1.90) | 1.20 | .24 | .04 |
| Task dimension | 6.85 (1.20) | 5.99 (1.35) | 2.79 | .01** | .67 |
| Control variables | | | | | |
| Depression symptoms | 11.67 (7.81) | 9.78 (5.81) | 1.15 | .26 | .27 |
| Anxiety symptoms | 33.74 (26.63) | 24.88 (17.93) | 1.63 | .11 | .39 |
| ODD and CD Symptoms | 6.64 (5.09) | 5.28 (4.65) | 1.16 | .25 | .28 |

Note: * $p < .05$, ** $p < .01$, edu. Education level FSIQ full scale IQ, ADHD attention deficit hyperactivity disorder, DISC-IV subtype based on diagnostic interview schedule for DSM-IV parent version, ODD oppositional defiant disorder, CD conduct disorder ES Effect Size (Cohen's d /Cramer's V)

6. Therapists were trained to use MI (see e.g. Naar-King & Suarez, 2011). Additionally, adolescents in both treatments could earn a reward from their parents when all treatment sessions were attended.

Plan My Life (PML; Kuin, Boyer, & Van Der Oord, 2013)

Each session included the discussion of a fixed planning skills topic. Various strategies involving

planning and organization were presented to the adolescent each week after discussing what would be worked on in treatment that session. If negative thoughts about the new strategy were brought up, the thoughts were challenged and the therapist and adolescent formulated more helpful thoughts. For each session with the adolescent, strategies attempted over the past week were discussed, consisting of successes, potential room for improvement, and related cognitions. Moreover, the adolescent's daily

planner and to-do list from the previous week was shown to the therapist and, if needed, adjusted for the upcoming week. For the two parental sessions, the focus was to find a balance between keeping control of their child and letting go. Further, parents were taught how to formulate, as well as implement, rules in the household. Finally, parents were taught how to facilitate positive communication with their adolescent (see Boyer et al., 2015).

Solution-Focused Treatment (SFT; Boyer, Kuin, Oberink, & Van Der Oord, 2014)

Each session consisted of the adolescent and therapist discussing a problem the adolescent had encountered in the past week. The adolescent was guided towards a solution to this problem by using fixed questions:

1. What is the subject you chose?
2. How is the present situation a problem for you?
3. How would you like it to be?
4. What are solutions you used in the past and what are other possible solutions to the problem?
5. Does the situation, as it is now, have advantages?
6. Would you like to change the situation now/ later/not at all?
7. If you choose to change, what is your plan?
8. If you choose to change later or not at all, what are your considerations (pros and cons)?

Further, each session began with the therapist asking the adolescent what went well in the past week and if the subject of last week had to be discussed again at the current session. In the two parent sessions, the same questions were asked regarding problems that the parent was facing in raising their adolescent. In SFT, the therapist did not tell the adolescent or parent what to do, nor did

he or she teach new skills. Instead, the therapist guided the adolescent towards a solution, using the fixed questions (Boyer et al., 2015). The topics chosen by the adolescents in SFT were planning-based 61.7% of the time, demonstrating that adolescents felt a need to improve their planning and organization skills, regardless of the focus of the treatment (Boyer et al., 2015).

Differences

The crucial difference between PML and SFT is that in PML, planning skills were actively taught by discussing a fixed subject whereas in SFT, the adolescent/parent chose the topic of each treatment session themselves and was guided to his/her own solution (Table 2). This difference in treatment therefore created differences in focus and structure.

Treatment Fidelity

Several actions were taken to promote and ensure treatment fidelity (Gearing et al., 2011) such as biweekly supervision by a certified behavior therapy supervisor including role-play and inspection/feedback of the sessions' video-recordings. Further, recorded adherence and contamination, therapist-reported adherence and treatment diffusion were all used as measures of intervention fidelity (Boyer et al., 2015).

MEASURES

Alliance

Alliance was measured with the *Therapy Process Observational Coding System for Child Psychotherapy-Alliance scale* (TPOCS-A; McLeod & Weisz, 2005). This 9-item scale assesses the quality of the client-therapist alliance in youth treatment. The TPOCS-A consists of six items assessing the affective elements of the client-therapist relationship, and three assessing client participation in therapeutic activities (Supplementary Table 2). Coders observe entire sessions and rate

Table 2
Content of SFT and PML Treatments

| Session | PML | SFT |
|----------|--|--------------------------------------|
| 1 | Psycho-education and treatment goals | Psycho-education and treatment goals |
| 2 | Finding new solutions for existing | Solve self-formulated problem |
| Parent 1 | Treatment content and parenting goals | Solve self-formulated problem |
| 3 | Use of to do list and prioritizing | Solve self-formulated problem |
| 4 | Divide big problem in small steps | Solve self-formulated problem |
| 5 | Concentration in classroom and during homework | Solve self-formulated problem |
| Parent 2 | Household rules | Solve self-formulated problem |
| 6 | Planning homework | Solve self-formulated problem |
| 7 | Help from friends and family | Solve self-formulated problem |
| 8 | Relapse prevention | Repetition of solutions |

each item on a 6-point scale ranging from 0 (*not at all*) to 5 (*a great deal*). In our sample the TPOCS-A has demonstrated item inter-rater reliability ranging from .48 to .80 ($M_{ICC} = .67$) and internal consistency ranging from .91 to .95 ($M\alpha = .92$). Convergent validity of the TPOCS-A with self-report alliance instruments range from .48 to .53 (Fjermestad, Lerner, et al., 2016; Liber et al., 2010) and predictive validity with clinical outcomes have been shown (Liber et al., 2010; McLeod & Weisz, 2005). In our sample the bond and task questions were correlated significantly ($r = .410, p < .001$), and combined into one total alliance score, similar to McLeod and Weisz.

Competence

The competence in motivational interviewing factors and treatment skills (hereafter “Competence”) was measured using an adapted version of the Motivational Interviewing Treatment Integrity (MITI 3.1.1; Moyers, Martin, Manuel, Miller, & Ernst, 2010), as MI is central in both treatments. The factors of MI that are measured are also basic therapeutic skills relevant for all therapists (Brown et al., 2017): evocation, collaboration, autonomy/support, and empathy. The MITI is a behavioral observer-rated coding system that measures how well or poorly a therapist is using MI and these basic therapeutic skills. Coders observe entire sessions and rate five items on a 5-point Likert scale, with the coders assuming a beginning score of “3” and moving up (high on the MI factor) or down (low on the MI factor) from there according to their observation. We used four items of the MITI that were relevant to our treatments: evocation, collaboration, autonomy/support, and empathy. The fifth item of the MITI, “direction,” was replaced by an item called “skill,” measuring the extent to which the therapist showed an understanding of the treatment mechanism (i.e., in our manual solution focused or planning skills focused treatment skills) and implemented this in the session. We did not include the “direction” item of the MITI, as the authors of the MITI stated that high scores on this scale do not necessarily reflect better use of MI (Moyers et al., 2010), while the other four factors do. Moreover, we needed a measure of skills assessment for the intervention specific skills of the therapist. Moyers, Martin, Manuel, Hendrickson, and Miller (2005) examined the reliability of the MITI (using the original subscales) and found that the ICC for each item ranged from .52 to .97. Another study found inter-rater reliability to range from .50 to .62, using the 2*WSSD method, which are deemed to be good levels of agreement (D’Amico et al., 2012). In our sample, the MITI demonstrated item inter-rater

reliability ranging from .69 to .83 ($M_{ICC} = .74$). To establish the most parsimonious way of representing competence we examined correlations among the five items. The correlations ranged from .82 to .89, indicating redundancy ($r > .70$; Kline, 1979). These results suggest that using a single score is the most parsimonious scoring approach and is consistent with previous research suggesting it is difficult to differentiate between dimensions of technical and global therapist competence (Brown et al., 2017; McLeod et al., 2018). Observed competence (total sum score and each subscale separately) did not differ between our treatments (see Table 1).

PRIMARY OUTCOMES

ADHD Symptoms

ADHD symptoms of the adolescent were rated by parents, using the Disruptive Behavioural Disorder rating scale parent version (DBD; Oosterlaan, Scheres, Antrop, Roeyers, & Sergeant, 2000). This measure included four scales composed of DSM-IV criteria for ADHD Inattention, ADHD Hyperactivity/Impulsivity, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD). The ADHD symptoms score was calculated by adding the ADHD Inattention and ADHD Hyperactivity/Impulsivity scales, with a higher score indicating more symptoms of ADHD.

Planning Problems

Planning problems of the adolescent were rated by parents using the Plan/Organize scale of the Dutch Behaviour Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000; Smidts & Huizinga, 2009). This measure aims to quantify the everyday EF as observed by parents in natural everyday environments, whereby higher scores indicated more Planning problems.

CONTROL VARIABLES ACCOUNTING FOR ALTERNATIVE EXPLANATIONS

ADHD Symptoms

See DBD above. Note that the pretest measurement was used as the control variable, while the difference between post- and pretest was used as the outcome variable.

Depression Symptoms

Depressive symptoms were measured using the 27 item self-reported Child Depression Inventory (CDI; Sitarenios & Kovacs, 1999; Timbremont & Braet, 2002). Higher scores indicated more depressive symptoms.

Anxiety

Anxiety of adolescents was measured using the 69 item self-reported Screen for Child Anxiety Related

Emotional Disorders (SCARED; Birmaher et al., 1997; Muris, Bodden, Hale, Birmaher, & Mayer, 2007). Higher scores indicated more anxiety symptoms.

ODD and CD Symptoms

ODD and CD symptoms were measured using the ODD and CD scales of the parent-rated DBD (Oosterlaan et al., 2000). This score is calculated by adding the ODD and CD scales, with a higher score indicating more symptoms of ODD and CD.

CODING AND SESSION SAMPLING PROCEDURES

Two Dutch females with master's degrees in psychology (behavior therapists with substantial experience in working with adolescents with ADHD; $M_{\text{years}} = 5.37$, $SD_{\text{years}} = 5.44$) coded all treatment sessions. They were trained by author BB and BDM as described in McLeod et al. (2014). The training used videotapes of later sessions of the same adolescents with ADHD, as the later sessions are not relevant for the current study. Training was provided over a 4-week period and consisted of reading the scoring manual of the TPOCS-A and the MITI, reviewing specific session segments, and practicing scoring sessions. Once coding began each video was double-coded for reliability and weekly meetings were held to prevent rater drift. The coders rated a set number of videotaped sessions per week for 4 weeks. Sessions were assigned to coders, who were blind to study hypotheses and treatment condition. The inter-rater reliability was found to be high for each week of coding for both the MITI ($ICC_{\text{Week 1}}(2, 2) = .80$, $ICC_{\text{Week 2}}(2, 2) = .94$, $ICC_{\text{Week 3}}(2, 2) = .79$, $ICC_{\text{Week 4}}(2, 2) = .86$) and the TPOCS-A ($ICC_{\text{Week 1}}(2, 2) = .94$, $ICC_{\text{Week 2}}(2, 2) = .83$, $ICC_{\text{Week 3}}(2, 2) = .72$, $ICC_{\text{Week 4}}(2, 2) = .87$). After coding all sessions, the two coders had high inter-rater reliability of $ICC(2, 2) = .72$ on the TPOCS-A and of $ICC(2, 2) = .81$ on the MITI. Mean scores of both coders were used for analyses as this reduces measurement error.

MISSING DATA

The missing data on the two primary outcome variables (i.e., ADHD Symptoms and Planning problems) and the control variables (i.e., depression, anxiety and ODD/CD symptoms) were imputed for the current study using stochastic regression (Baraldi & Enders, 2010). These missing data were not related to any participant characteristics and therefore were missing completely at random ($\chi^2, N = 73 = 54.61, p = .95$). The highest rate of missing data for any one variable was found to be 15.9%, for the SCARED.

STATISTICAL ANALYSIS PLAN

T-tests and chi-square tests were run for baseline, outcome, and alliance differences between PML and SFT. Linear regressions on the pre to posttest difference of the primary outcomes were executed to determine if alliance is predictive of the differences in the primary outcomes, differentially for PML and SFT. If a significant association between alliance and treatment outcome is found, linear regressions were re-analysed with control variables added. In addition, exploratory analyses were conducted to examine bond and task separately, with regard to the alliance-outcome associations. Finally, mediation analyses were conducted using the PROCESS tool (Hayes, 2012) to determine the role of therapist competence in the formation of the alliance and the subsequent outcome of the adolescent (i.e. alliance as a mediator between competence and outcome).

Results

SAMPLE DESCRIPTION AND BASELINE COMPARISON

For descriptive statistics of the sample in each treatment, see Table 1. There were no significant differences between treatment conditions on any of the sample characteristics or primary outcomes at baseline, with the exception of father's education ($p = .039$), which was controlled for in later analyses. Table 3 shows the primary outcomes at pretest and

Table 3
Means and Standard Deviations of PML and SFT Primary Outcome Variables at Pretest and Posttest

| | Pretest | | Posttest | | <i>t</i> | <i>p</i> | <i>d</i> |
|-------------------|----------|-----------|----------|-----------|----------|----------|----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| PML | | | | | | | |
| Planning problems | 28.03 | 4.23 | 25.39 | 4.48 | 2.47 | .02* | .61 |
| ADHD Symptoms | 24.39 | 9.51 | 19.09 | 9.71 | 2.24 | .03* | .55 |
| SFT | | | | | | | |
| Planning problems | 28.68 | 3.74 | 26.41 | 5.07 | 2.17 | .03* | .51 |
| ADHD Symptoms | 23.78 | 8.83 | 18.66 | 10.86 | 2.20 | .03* | .52 |

Note: * $p < .05$, ** $p < .01$

posttest and as in Boyer et al. (2015), both PML and SFT significantly improved in these outcomes.

IS THERE A DIFFERENCE IN ALLIANCE BETWEEN PML AND SFT?

Alliance significantly differed between PML and SFT ($d = .52$); alliance was significantly higher for the adolescents in PML compared to those in SFT (Table 1). Separate t -tests showed that the task dimension of alliance drove the difference; adolescents in PML and SFT significantly differed on the task dimension ($d = .67$), but not on the bond dimension ($d = .04$), with adolescents in PML having a higher task alliance than those receiving SFT.

IS ALLIANCE PREDICTIVE OF OUTCOMES FOR PML AND SFT?

Treatment Outcomes²

Planning problems. The effects of alliance were analyzed between treatment conditions as well as the interaction between the two on Planning problems. Linear regressions were conducted on the difference scores between pretest and posttest (Table 4). Treatment condition (SFT vs. PML) significantly predicted Planning problems from pretest to posttest; a significant reduction in Planning problems was found for both treatments from pretest to posttest, but more for PML than for SFT (as is consistent with the findings in the larger study, however, this was a small effect that did not survive Bonferroni correction; Boyer et al., 2015). A treatment by alliance interaction on Planning Problems from pretest to posttest was also significant. For the adolescents in SFT, there was a reduction in Planning problems as the alliance increased. For the adolescents in PML, the scores on the Planning problems did not significantly worsen or reduce as alliance increased (Figure 2). Running these regression analyses while including the control variables resulted in similar findings³ (Table 4). Finally, exploratory analyses revealed an alliance by treatment interaction on Planning problems from pretest to posttest for task, but not bond (Supplementary Table 3), and remained similar when the control variables were added (Supplementary Table 4). These interactions show that there was a reduction in Planning problems from pretest to

² Outliers were considered any data points +/- 3 SD away from the mean. Outliers were removed and all analyses were re-done. As all results remained the same, the reported results have the outliers included.

³ Results were similar when father education was added as a control variable (as this was significantly different between SFT and PML); results are therefore reported without adding this as a control variable.

Table 4

Results From Regression Analysis of Alliance, Treatment and the Interaction on Planning Problems and ADHD symptoms between Posttest and Pretest Followed by the Regression Analysis of Alliance, Treatment and the Interaction on Planning Problems With Control Variables Added

| | Pretest to posttest | | | |
|--------------------------|---------------------|-------|---------|------|
| | B | S.E. | β | p |
| <i>Planning problems</i> | | | | |
| Alliance | 1.03 | 0.67 | 0.59 | .13 |
| Treatment | 13.16 | 6.21 | 1.34 | .04* |
| Alliance x Treatment | -0.92 | 0.42 | -1.41 | .03* |
| R^2_{adj} | .07 | | | |
| <i>ADHD symptoms</i> | | | | |
| Alliance | 0.55 | 1.52 | 0.15 | .72 |
| Treatment | 9.06 | 14.12 | 0.43 | .52 |
| Alliance x Treatment | -0.66 | 0.96 | -0.47 | .49 |
| R^2_{adj} | -.03 | | | |
| <i>Planning Problems</i> | | | | |
| Alliance | 1.20 | 0.72 | 0.69 | .10 |
| Treatment | 15.47 | 6.60 | 1.58 | .02* |
| Alliance x Treatment | -1.05 | 0.44 | -1.62 | .02* |
| <i>Control Variables</i> | | | | |
| Age at pretest | 0.53 | 0.49 | 0.13 | .28 |
| Gender | 1.64 | 1.34 | 0.15 | .23 |
| ADHD symptoms | 0.12 | 0.07 | 0.22 | .10 |
| ODD symptoms | -0.04 | 0.14 | -0.05 | .73 |
| Depression symptoms | 0.07 | 0.11 | 0.10 | .52 |
| Anxiety symptoms | 0.01 | 0.03 | 0.06 | .68 |
| R^2_{adj} | .08 | | | |

Note: * $p < .05$ ** $p < .01$ S.E. Standard Error

posttest when the task dimension of alliance was higher, but only for those in SFT.

ADHD Symptoms. No significant results were found for the outcome variable ADHD symptoms (Table 4), implying that while the treatments on their own improve treatment outcomes (as seen in Table 3), alliance, whether bond or task, does not play a role in this improvement.

Alliance as a Mediator Between the Therapist's Competence and Treatment Outcome

As an exploratory analysis, three separate mediational models tested alliance and its components (bond and task) as mediators in the relationship between therapist competence and outcome (see Figure 3) for the significant alliance-outcome associations (i.e., Planning problems in SFT)⁴.

Our mediation analyses using the PROCESS tool (Hayes, 2012) showed that the direct effect between

⁴ As no significant alliance-outcome associations were found for those in PML, nor a competence-outcome association (only competence and alliance were significantly related), the mediation analysis was not analysed for adolescents PML.

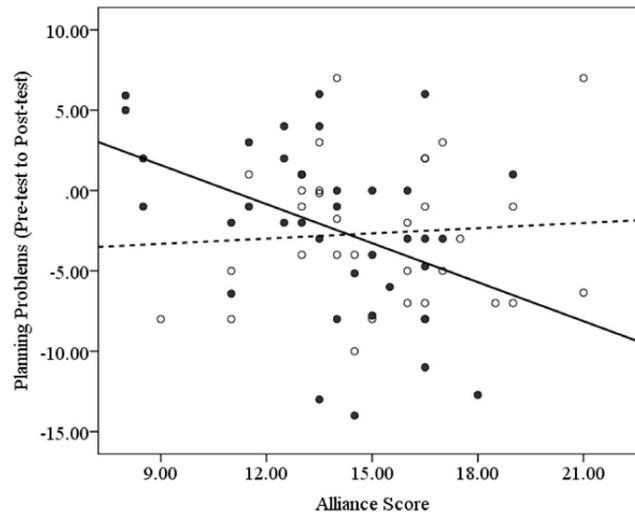


FIGURE 2 A scatterplot of alliance scores across Planning problems from pretest to posttest. The solid black points and solid black line represent the SFT group data points and regression line, respectively. The open black points and the dotted black line represent the PML group data points and regression line, respectively.

competence and Planning problems (path c') was not significant (95% CI [-.64, .27]), while the indirect mediational effect of alliance between competence and outcome on Planning problems (path ab), using a bootstrap approach with 5000 samples, was significant (95% CI [-.60, -.02]). However, the effect between alliance and Planning problems (path b), while competence was taken into account, just missed significance (95% CI [-1.47, .02]), therefore the mediation was not significant. Analyzing the components of alliance bond and task separately showed that the task component of alliance did fully mediate the relationship between therapist competence and Planning problems as the direct effect between therapist competence and Planning problems (path c') was not significant (95% CI [-.55, .34]) while the indirect effect (path ab) and the effect between task and planning problems (path b) using a bootstrap approach with 5000 samples were significant (95% CI [-.68, -.09]; 95% CI [-3.38, -.34], respectively). For bond, the mediation model was not significant; the indirect effect of bond as the mediator between therapist competence on Planning problems (path ab) and the direct effect of therapist competence and Planning problems (path c') were not found to be significant (95% CI [-.40, .07]; 95% CI [-.76, .11], respectively).

Discussion

Alliance in externalizing adolescents is rarely explored and even less in adolescents with ADHD. Our study was the first to investigate observer-rated

alliance in adolescents with ADHD and the influence of alliance on the outcomes of two CBTs differing in focus and structure. Also exploratively, we investigated alliance as a mediator between therapist competence and treatment outcome. The results suggest that alliance plays an important role in the treatment of adolescents with ADHD, but that this role is dependent on the type of treatment administered. The alliance was higher in the treatment in which planning skills were taught in a structured, focused way. However, this higher alliance did not translate to better treatment outcomes. Rather, a stronger alliance predicted improved outcomes in the less structured treatment in which adolescents were guided to a solution for their own stated problem. Also, in the less structured CBT, the competence of the therapist played a role in the alliance and the outcome; alliance fully mediated the relationship between the competence of the therapist and the outcome, i.e., the reduction of Planning problems. The more competent a therapist was, the more they were able to collaborate on therapeutic activities (task dimension of alliance), and the more reduction in Planning problems of the adolescent. Our findings build on previous literature (Langberg et al., 2013, 2016), and have important implications for the field.

First, the results showed that adolescents in the more structured PML had a significantly higher alliance than those in the more loosely structured SFT. Specifically, the ability to work together and collaborate on accomplishing the therapeutic activities (the task dimension of alliance) differentiated the groups, while the bond was similar in both

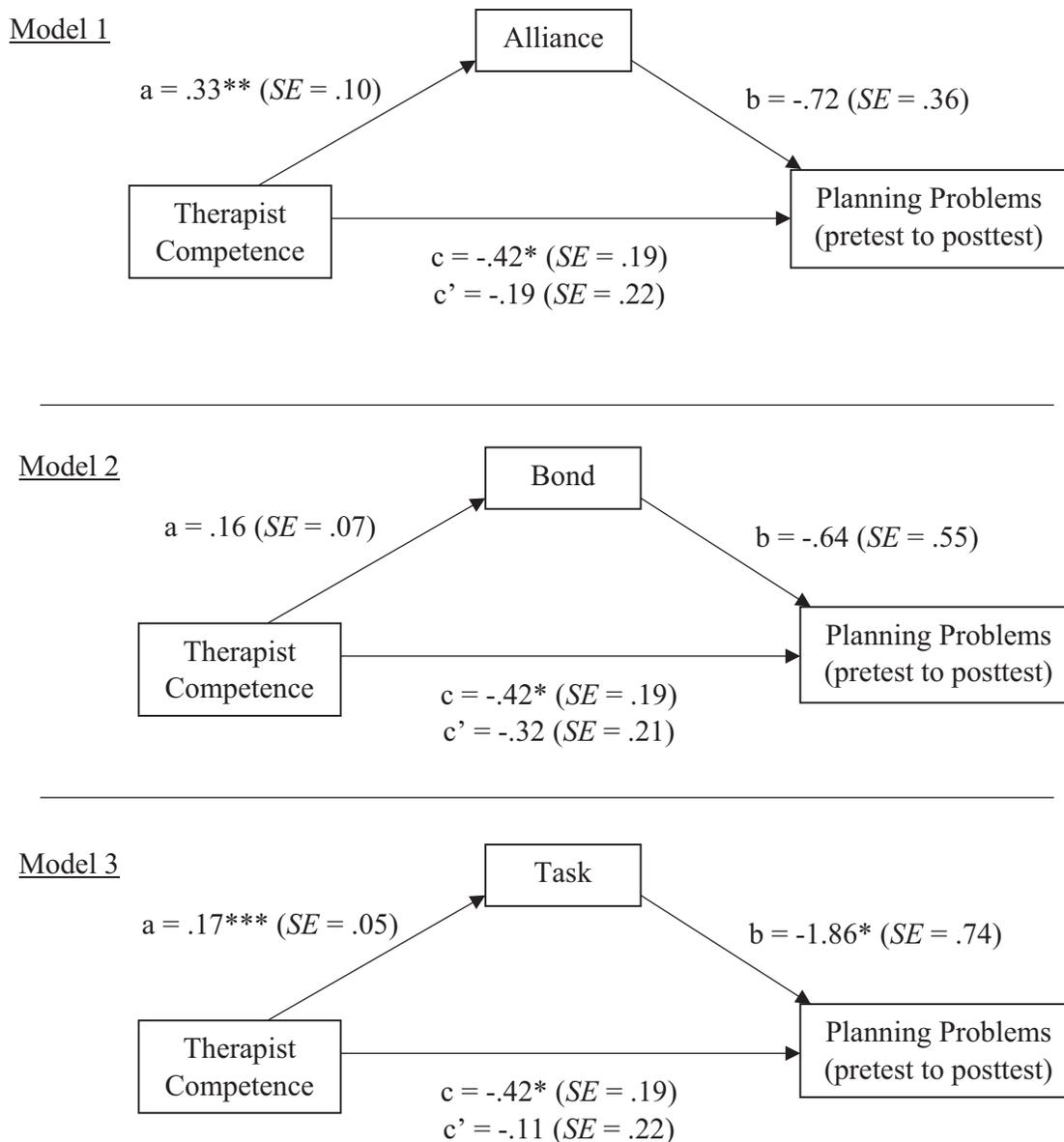


FIGURE 3 The mediational models of alliance (top), bond (middle), and task (bottom) as mediators between the competence of the therapist and adolescent's Planning problems, using the unstandardized regression coefficients as path values. Note: c = total effect, c' = direct effect, * $p < .05$, ** $p < .01$, *** $p < .001$

treatments. This indicates that a treatment structure in which the focus is clear and the method is predictable and structured, may help adolescents with ADHD who often find it difficult to implement structure themselves (Boyer et al., 2015; Langberg et al., 2016), in terms of working together and collaborating.

Second, we also showed that alliance was differentially predictive for each treatment, it was predictive for the less structured and focused SFT but not for the more structured PML. An alliance-outcome association was found for the less-structured SFT such that when alliance increased, the planning

problems of the adolescents reduced from pretest to posttest. This is in contrast to samples with internalizing problems as differential effects of alliance on outcome have been found before, but generally have been reported to favour structured treatments (Bedics, Atkins, Comtois, & Linehan, 2012; Lorenzo-Luaces et al., 2017; Ormhaug et al., 2014; Snippe et al., 2015). Further, we found that the alliance in SFT may be a mediator between the therapist's competence and outcome; the more competent the therapist, the better the outcome, but only when alliance is also high. Our findings suggest that when there is less structure and focus, therapists

may need to be more competent and to invest more in alliance formation to achieve optimal outcomes.

We defined competence as a combination of collaboration, evocation, empathy, support (factors also being related to motivational interviewing competence), and skill in the treatment at hand. The fact that we found these competence factors in both CBT groups is consistent with the idea that MI and therapeutic skills complement each other when blended with CBT (Naar & Safren, 2017). With that said, to our knowledge no studies have compared levels of therapist competence in different types of CBT other than adolescents with ADHD, so we cannot conclude that effects are specific for this clinical group.

In understanding the mechanisms underlying the improvement in treatment outcomes in SFT but not PML, the task dimension of alliance could potentially play a role, as this was the driving dimension of alliance that differentiated the two treatments, and not the therapist-client bond. The task dimension of the alliance is defined as participation in therapeutic activities (McLeod & Weisz, 2005). It is therefore perhaps the rigid and consistent structure of the PML that forms an automatic ability for adolescents with ADHD and their therapists to collaborate and agree on treatment activities (i.e., task). In contrast, the less structured SFT may require the task dimension of alliance to be evoked by a competent therapist, resulting in improved treatment outcomes. This interpretation also falls in line with the traits of adolescents with ADHD, who have motivational deficits and find implementing structure themselves to be a challenge (Boyer et al., 2015; Boyer et al., 2018; Langberg et al., 2016) and therefore rely more on the competence of the therapist to implement this structure. However, future research is needed to examine further the mechanisms driving this differential finding between the two treatments.

Third, our study also shows the importance of studying alliance in adolescents with ADHD, often a difficult group with lack of motivation and at risk for treatment dropout. In the larger study that this sample was drawn from, dropout rates were low (4.8% in PML and 5.3% in SFT; Boyer et al., 2015), possibly due to the incorporation of MI in the treatments. Future studies may examine manualized CBTs as compared to usual care, as dropout rates may be higher here, enabling the examination of the alliance-dropout association. More research in this subgroup is recommended (e.g., accounting for therapist factors, more objectively measuring the role of structure/focus in a treatment). Also, comparing alliance in different treatment types in other subgroups of adolescents (e.g., those with

internalizing disorders) is recommended to explore if our findings generalize to adolescents with other psychopathologies.

Our results should be interpreted in light of study limitations. First, our sample was a subsample of a larger sample (Boyer et al., 2015), although our sample seemed representative of adolescents with ADHD in general: 72.5% of the adolescents had the inattentive subtype, 72.5% were boys and 86.6% were taking medication (Barkley, 2004; Wolraich et al., 2005). Further, our supplementary analyses showed it was a representative random sample compared to the adolescents (Supplementary Table 1) of our larger treatment study and comparable in size to other alliance-related studies using objective measures (McLeod & Weisz, 2005). Second, questions about the discriminant validity of alliance instruments in youth treatment have been raised (McLeod et al., 2014). Scores on observer-rated alliance and client involvement (i.e., client participation in therapeutic activities) instruments have not demonstrated discriminant validity (e.g., McLeod et al., 2014), which raises questions about whether alliance or client involvement is being assessed with these instruments. It may be that our findings related to task have implications for client involvement. However, as the TPOCS-A has shown convergent validity with independent self- and observer-report alliance instruments (see Fjermestad et al., 2012; McLeod et al., 2017), we believe it safe to interpret our findings related to the task dimensions as relating to the alliance. Third, significant alliance-outcome associations were found for only one of our primary outcomes (Planning problems) and not for the other (ADHD symptoms), although both improved from pre- to posttest. It may be that the task component of alliance, specifically, is important for improvement in this particular outcome in SFT; only in the context of an agreement on treatment goals will the Planning problems decrease (of note adolescents chose planning skills as a topic of discussion 61.7% of the time in SFT). While for ADHD symptoms to improve, this context may be less important. In addition, although we controlled for the most relevant alternative explanations, we cannot ascertain that other non-measured variables may be related to the found effects. Fourth, given that clients were nested in therapists, multilevel modeling may have been preferable. However, as this was a study run in clinical practice over multiple sites and therapists, there were not enough adolescents per therapist (a maximum four adolescents/therapist) to conduct this analysis. Fifth, we did not predesign our study to assess the mediating role of alliance in the association between the competence of the therapist and outcome. As such, this question was exploratory and the analyses may

have been underpowered to reach statistical significant effects (e.g., for the total scale of alliance). Further, for the analyses to be truly mediational, the therapist competence would have had to be measured before the alliance. As our study was not predesigned for this analysis, the same videos were used to code both therapist competence and alliance. However, theoretically and logically, the competence of the therapist is what influences alliance as opposed to the alliance influencing the more stable, skills-based competence of the therapist. Therefore, while we deem our mediational models probable, future research is needed to assess therapist competence, alliance, and outcome in a mediational analysis, with competence being assessed before alliance. Further, pre-study interrater reliability of our competence measure was just below acceptable norms (.56) at the end of the coder training, however, from the start of the study onwards this interrater reliability was good. Finally, the two groups, SFT and PML, while distinct in their methods, are still somewhat similar to each other in that they both use manuals, have psychoeducational components, use MI and follow a specific structure each session. The current study would have benefitted from having a third control group (e.g., a “usual care” group) as potentially larger between treatment differences in alliance and alliance outcome association may be anticipated.

CONCLUSION

Our study found that the alliance was stronger in a structured CBT than in a less structured CBT for adolescents with ADHD. But, of note, in the less structured treatment alliance was related to outcome, while in structured treatments, it was not. Further, in the less structured CBT the therapist’s competence in building this alliance is important for a better outcome. These findings have clinical implications. Structure in CBT may be important for adolescents with ADHD as it results in higher alliance. However, when using less structured CBT with adolescents with ADHD, therapists may need to invest more in the alliance to improve treatment outcomes, for example by enhancing their competence.

Conflict of Interest Statement

Bianca E. Boyer is co-developer and author of the manuals "Plan My Life" and "Solution Focused Treatment." She receives royalties for the sales of both interventions. Saskia van der Oord has been a paid consultant for Janssen Pharmaceuticals in the development of a serious game “Healseeker”: aimed at training cognitive functions. She is co-developer and author of the manuals "Plan My Life" and "Solution Focused Treatment." However, she has no financial interest in the sales of any of the interventions. Speaker’s fees of Shire and MEDICE. Other authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.beth.2018.01.003>.

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