

Preliminary Evaluation of an Observational Measure of Group Cohesion for Group Psychotherapy

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Objective: Group psychotherapy research would benefit from an observational measure of group cohesion to complement existing self-report measures. This study introduces the Therapy Process Observational Coding System-Group Cohesion scale (TPOCS-GC), which observationally assesses cohesion between each member and the group. **Method:** In total 27 parents participated in a group parent-training social competency intervention for children with attention deficit-hyperactivity disorder. Independent coders double-coded group cohesion and the alliance in 144 client-sessions. Parents, teachers, and children completed cognitive, behavioral, and therapy participation measures. **Results:** The TPOCS-GC demonstrated modest to strong item-level interrater reliability and acceptable internal consistency. Group cohesion evidenced moderate stability over the course of treatment. Relations between TPOCS-GC and theoretically linked and unrelated variables provided some evidence for construct and predictive validity. **Conclusions:** This preliminary study suggests that the TPOCS-GC is a reliable instrument that may help fill an instrumentation gap in the field. © 2012 Wiley Periodicals, Inc. *J. Clin. Psychol.* 69:191–208, 2013.

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Therapeutic relationships are considered essential ingredients in adult and youth psychotherapy (Horvath, Re, Flückiger, Symonds, & Norcross, 2011; Shirk & Karver, 2011). The most well-known of these, the alliance between client and therapist, has received theoretical and empirical consideration (Elvins & Green, 2008) and has demonstrated reliable relations to outcome in recent meta-analyses (Horvath et al., 2011; McLeod, 2011; Shirk & Karver, 2011). However, therapeutic relationships in group-based therapy have received less attention (Burlingame, McClendon, & Alonso, 2011). A growing literature has considered alliance in such contexts (e.g., Crowe & Grenyer, 2008; Lerner, Mikami, & McLeod, 2011; Shechtman & Leichtenritt, 2010); however, there exist other important relationships in group-based interventions such as *group climate* (i.e., an overall group-level process), *individual bonding within groups* (i.e., member-member relationships), and *group cohesion* (the therapeutic relationship between participants and the group; Joyce, Piper, & Ogrodniczuk, 2007; Yalom, 1995). The latter of these has thus far received the most empirical and theoretical scrutiny.

Empirical investigations into group cohesion suggest that it is reliably related to outcomes; for instance, Burlingame et al.'s (2011) meta-analysis found a moderate ($r = .25$) correlation between cohesion and outcomes of reduced symptom distress and increased social functioning. This finding was especially pronounced for groups in which therapists encouraged interaction between members, groups with five to nine members, and groups targeting outcomes in youth.

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Moreover, studies suggest that group cohesion is distinct from the alliance (Lorentzen, Sexton, & Høglend, 2004; Marziali, Munroe-Blum, & McCleary, 1997), and alliance and group cohesion may each predict added variance in outcomes (Joyce et al., 2007). Altogether, this research suggests that group cohesion may represent an important ingredient of group-based psychotherapy.

Though the extant research indicates the importance of studying group cohesion, conceptual and methodological issues have slowed progress in the field (Johnson, 2007). The field has not yet achieved consensus on how to define cohesion (Burlingame et al., 2011). This fact makes it difficult to compare findings across studies employing different measures. A reliance upon self-report measures may have contributed to these definitional problems (Burlingame et al.). Self-report measures can provide valuable information on client and therapist subjective experience of group cohesion. However, it is helpful to have multiple methods to assess group cohesion when attempting to clarify the definition of the construct (Elvins & Green, 2008).

The development of an observational measure might benefit the field by providing an additional method to which to compare self-report measures. To our knowledge, only two studies have observationally coded group cohesion (Budman, Soldz, Demby, & Feldstein, 1989; McNeil, 2006). Crucially, one observational measure is from an unpublished dissertation (McNeil, 2006), and the other is unavailable (S. Budman, personal communication, October 20, 2008). To help address definitional issues in the field, it is important to employ a multimethod approach so that method variance can be ruled out (Elvins & Green, 2008; McLeod, 2011). Towards this end, an observational measure would provide an important compliment to existing self-report group cohesion measures.

Beyond helping to clarify definitional issues, observational measures offer a number of methodological benefits. For example, observational measures require no effort on the part of clients, do not introduce methodological confounds of repeated measurement (i.e., test-retest effects), and may thus be employed at every session. Likewise, observational measures afford the ability to use blinded raters, greater confidence that comparable behaviors are being classified similarly across studies and modalities, and (with recording) the ability to rate sessions that have already occurred. Observational process measures such as the Therapy Process Observational Coding System-Alliance Scale (TPOCS-A; McLeod & Weisz, 2005), the Working Alliance Inventory-Observer Form (Tichenor & Hill, 1989), and the Adolescent Therapeutic Alliance Scale (Faw, Hogue, Johnson, Diamond, & Liddle, 2005) have demonstrated precisely these features, and have benefited the field in terms of psychometric strength and rigor.

The purpose of this study is to develop an observational group cohesion measure. In developing such a measure, it is important to consider how best to measure group cohesion. A recent review concluded that group cohesion research focuses on *structure* (relationships between which members of the group) and *quality* (what kind of relationship; Burlingame et al., 2011). Both factors must be considered when developing a group cohesion measure.

The structure of group cohesion may be horizontal (between group members) or vertical (between each member and the therapist). As a vertical structure overlaps with alliance, many measures assess the horizontal structure. Within horizontal structure, measures focus upon group cohesion at several levels. Overall group structure considers cohesion across all members at once (Budman et al., 1989). However, this approach tends to see cohesion as a group-level process and thus is conceptually very similar to group climate. Member-member structure considers cohesion between individuals and requires each group member to assess his or her connectedness to each other member. Conceptually, this level is similar to individual bonding within groups. Finally, member-group structure considers cohesion between each individual and the whole group (Burlingame et al., 2011; Krogel, 2008). Presently, it is unresolved whether group cohesion should be measured at the member-group or overall group level. Ultimately, three reasons led us to focus upon member-group. First, it is less burdensome to measure than member-member cohesion, increasing the utility of the new measure for future researchers. Relatedly, most recent self-report measures have contained a member-group structure. Finally, doing so

also allows researchers to empirically investigate whether group cohesion is best characterized at the individual or group level (see Bakali, Baldwin, & Lorentzen, 2009).

Measures also vary in consideration of group cohesion *quality* (Budman et al., 1989; Burlingame et al., 2011; Joyce et al., 2007). As has been widely noted (e.g., Bakali et al., 2009; Burlingame et al., 2011; Johnson, Burlingame, Olsen, Davies, & Gleave, 2005), definitions and indicators have varied considerably, including sticking-togetherness, group attractiveness, and length of a group hug. While recent work suggests that group cohesion may contain up to three components (positive bond, positive work, and negative relationship; Burlingame et al., 2011), the definitional variability presents challenges for measure development.

However, there is general agreement that group cohesion includes the presence of positive *bonding* (and absence of negative bonding) behavior between members of therapeutic groups. That is, theoretical (e.g., Johnson, 2007; Lorentzen, 2008), correlational (e.g., Joyce et al., 2007; Lorentzen et al., 2004), and factor analytic (e.g., Bakali et al., 2009; Johnson et al., 2005) work suggests that group cohesion is characterized by “a network of affective bonds” (Joyce et al., 2007, p. 271) or “a sense of belonging and esprit de corps within a group” (Johnson et al., 2005, p. 310). Measures focusing on bonding may therefore benefit the field since researchers generally agree that this is an important component of group cohesion.

The bonding component of group cohesion is believed to play an important role in facilitating positive outcomes in group therapy. This process is posited to help participants feel connected, engage in greater mutual disclosure and feedback (Tschuschke & Dies, 1994), and tolerate the discussion of stressful content (MacKenzie, 1997). Thereby, a positive bond with group members is hypothesized to give participants greater readiness and willingness to engage in therapeutic tasks and activities (Yalom, 1995), serving as a “base for the therapeutic “work” in the group process” (Joyce et al., 2007, p. 271).

The Therapy Process Observational Coding System-Group Cohesion scale (TPOCS-GC) was developed to fill a measurement gap by providing a coding system capable of objectively describing group cohesion. The TPOCS-GC differs from previous measures in several respects. First, it is based on the TPOCS-A (McLeod, 2005), an existing, psychometrically valid observational system. Second, it was developed in consideration of contemporary issues of cohesion structure (*member-group* vs. *overall* group). Third, it attempts to assess the core *bonding* quality present in most existing group cohesion measures.

In this study, we report on preliminary development and psychometric properties of the TPOCS-GC. We focus upon a group-based parent-training treatment for youth with attention deficit-hyperactivity disorder (ADHD) in which the alliance has already been shown to predict outcomes (Lerner et al., 2011). Parents of children with ADHD may feel frustrated and alone in their efforts to help their children develop effective peer relationships (Johnston & Mash, 2001). Group cohesion, then, may allow them to feel less alone and more efficacious in attempting to engage in tasks designed to aid these efforts and provide a context for ample reinforcement when such efforts are accomplished. Additionally, the target intervention contains the variables (encouraging interaction between members, five to nine members, targeting outcomes in youth) most related to positive group cohesion-related outcomes (Burlingame et al., 2011), making it a favorable venue to evaluate the psychometric properties of a new group cohesion measure.

We hypothesized that the TPOCS-GC would demonstrate adequate interrater reliability and internal consistency among naïve observers. Next, we aimed to examine whether there was significant variability in group cohesion within-individuals, between-individuals, or between-groups. As very little previous research has considered this question, we did not propose a directional hypothesis. Instead, we sought to address the question of whether cohesion should be considered at the *overall* or *within*-group level (Budman et al., 1989). Next, we hypothesized that the TPOCS-GC would correlate with theoretically linked variables, and evidence discriminant validity by demonstrating null relations with theoretically unrelated variables. We hypothesized that group cohesion would demonstrate predictive validity by relating to session attendance (Hawley & Weisz, 2005; Kazdin, Whitley, & Marciano, 2006) and predicting change on key criterion variables (Lerner et al., 2011; Mikami, Lerner, Griggs, McGrath, & Calhoun, 2010; Shechtman & Katz, 2007; Shechtman & Leichtenritt, 2010).

Method

Participants

Participants were 27 parents (24 female; aged 29–48 years, $M = 37.42$, standard deviation [SD] = 5.35) of youth meeting criteria for a diagnosis of ADHD. Their children were ages 6–10 (mean [M] = 8.15, $SD = 1.32$) and predominantly male ($n = 18$). Participants were drawn from a larger randomized clinical trial of Parental Friendship Coaching (PFC; Mikami et al., 2010), in which 62 community-recruited parents of children with ADHD (all of whom reported that their children experienced peer problems) were randomly assigned to PFC ($N = 32$) or a waitlist control condition ($N = 30$). Six cohorts of five or six parents were randomized to PFC. The 27 parents in this study are the parents who completed the intervention¹. Informed consent was obtained from all participants.

Racial composition of the 27 parents was 85% White, 11% African American, and 4% other/mixed. Any parent/legal guardian of the child was eligible to participate so long as she or he was “the parent most involved in the child’s social life.” Of the 27 parents, all of whom had child custody, parental roles included: 20 biological mothers, two biological fathers, three adoptive mothers, one adoptive father, and one grandmother. Income ranged from less than \$10,000/year to over \$150,000/year ($M = \$64,667$). Education ranged from high school graduate/GED to advanced graduate or professional degrees, with most parents completing at least some college.

ADHD diagnosis was confirmed using the Child Symptom Inventory (Gadow & Sprafkin, 1994) and a structured clinical interview with the parent (K-SADS; Kaufman, Birmaher, Brent, & Rao, 1997). Exclusion criteria for youth were pervasive developmental disorder, General Abilities Index (GAI; a composite measure of intelligence that is appropriate for youth with ADHD) below 70, or Verbal IQ below 75. Fifteen youth were taking psychotropic medications. Because children with ADHD remain impaired in peer relationships when taking medication (Hoza et al., 2005), these children were not excluded and were instructed to maintain their medication regimen. Youth receiving psychosocial interventions for peer relationship problems were excluded. See Mikami et al. (2010) for further procedural details.

Treatment

Each PFC group was co-led by two therapists. The group leader was either a licensed clinical psychologist or a clinical psychology doctoral student. The co-leaders were either clinical psychology doctoral students or postbaccalaureate lab coordinators. Six therapists were female and two were male, ranging in age from 24 to 32 years ($M = 26.13$, $SD = 2.59$). Therapists received training in PFC that involved reading the treatment manual, observing videotapes of previous cohorts, and attending a preintervention training workshop. Throughout the treatment therapists attended weekly group supervision meetings.

Parents received eight weekly 90-minute group sessions held in a university psychology laboratory. PFC was delivered to six sequential cohorts of parent groups ranging in size from five to six parents. Therapists employed the treatment manual described by Mikami et al. (2010). Briefly, this treatment involved setting the foundation for parents becoming effective friendship coaches (sessions 1–2), instructing their children in specific skills to improve peer relationships (sessions 3–5), setting up social contexts to encourage friendships (sessions 6–7), and skill maintenance (session 8). Each session comprised didactic instruction of target skills, review of videotape of parent-child interactions, and role-play. Homework was assigned and reviewed each week.

Parents had opportunities to interact during review of previous week’s homework, discussion of target parental coaching strategies, role-plays, and by providing feedback to observed

¹The parents who did not complete PFC stated that the time commitment required to attend the sessions was too great ($n = 3$), thought it was not relevant for their child’s problems ($n = 1$), or had a personal emergency unrelated to PFC ($n = 1$). When compared to noncompleters, there were no significant differences on baseline or demographic characteristics (all $p > .14$).

videotapes of each parent's interaction with her child. Throughout sessions, parents were encouraged to consider and discuss ways in which strategies could be adapted to their individual child's needs. Across groups, 15 participants missed sessions (11 missed one session, three missed two sessions, and one missed three sessions), in which case they were provided with individual make-up review sessions². During the make-up sessions, participants met with one of the therapists and reviewed missed content.

Treatment adherence was assessed by an independent rater, who reviewed all session videotapes and compared topics with manual content using a checklist (present/absent). Manual adherence was determined to be 100% (for details, see Mikami et al., 2010).

Assessment Procedure

Questionnaire-based measures were administered to parents and teachers immediately before PFC began and after the conclusion of PFC.

Alliance Measure

TPOCS-A (McLeod & Weisz, 2005). The TPOCS-A comprises six items that assess affective elements of the client-therapist relationship (e.g., 'to what extent does the client demonstrate positive affect toward therapist') and three items that assess client participation in therapeutic activities ("to what extent does the client not comply with tasks"). Coders observed entire therapy sessions and rated each item on a 6-point scale ranging from 0 (*not at all*) to 5 (*a great deal*). The TPOCS-A has demonstrated adequate interrater reliability, internal consistency, and convergent validity when used to assess youth and parent-alliance in child-focused psychotherapy (Chiu, McLeod, Har, & Wood, 2009; Fjermestad et al., 2012; McLeod & Weisz, 2005) as well as in group-based cognitive-behavioral therapy for children with anxiety disorders (Liber et al., 2010) and parents of children with ADHD in PFC (Lerner et al., 2011). In this sample, intraclass correlations (ICC(1,2)) for TPOCS-A items, based upon the full sample of client-session tapes ranged from .66 to .89 ($M = .81$, $SD = .07$). Internal consistency of the TPOCS-A was acceptable overall ($\alpha = .77$) and at early ($\alpha = .79$) and late ($\alpha = .80$) sessions (Lerner et al., 2011).

Cognitive, Behavioral, and Therapy Participation Measures

Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003). Trained research assistants administered a six subtest version of the WISC-IV containing the core Verbal Comprehension (Similarities, Vocabulary, Comprehension) and Perceptual Reasoning (Block Design, Picture Concepts, Matrix Reasoning) subtests, which is used to assess the GAI of intelligence in child participants. The GAI is a well-established indicator of intelligence in those for whom working memory or processing speed is impaired (Ryan, Glass, & Brown, 2007), such as youth with ADHD. It was considered to be unrelated to group cohesion.

Conners' Parent and Teacher Rating Scales-Revised: Short Form (Conners, 2001). Conners' scales are widely-used parent- and teacher-report measures of ADHD symptoms. We obtained parent and teacher ratings of the ADHD Symptom Index at baseline, which contains 12 items, each scored on a 4-point Likert metric ($\alpha = .92$ – $.95$, depending on the sex of the child and whether the rater is the parent or the teacher). Raw scores were converted to age-normed and sex-normed standard scores, which were used as symptom severity indices thought to be unrelated to group cohesion.

²One participant attended two coded group sessions by phone; removing this participant from the analyses did not appreciably alter any obtained results.

Teacher Report Form (TRF) and Child Behavior Checklist (CBCL; Achenbach, 2001). The TRF and CBCL are the most widely used measures of child symptoms in the child clinical literature and have exceptionally strong reliability and validity data for measurement of their target constructs (Achenbach et al., 2003). We considered the parent and teacher ratings of the Social Problems narrow-band scale at baseline, which contains 11 items, each scored on a 3-point Likert metric ($\alpha = .82$ for both parent and teacher forms). Raw scores were converted to age-normed and sex-normed standard scores, which were used as an indicator of social problem severity thought to be unrelated to parent group cohesion.

Social Skills Rating System (SSRS-P & -T; Gresham & Elliott, 1990). The SSRS is a widely-used measure of social skills, which we obtained from parents and teachers. The parent version (SSRS-P) contains 40 items assessing socially competent behaviors thought to be relevant at home, and the teacher version (SSRS-T) contains 30 items assessing socially competent behaviors commonly displayed in a school context plus nine items assessing academic performance (SSRS-T-A). All items are answered on a 3-point Likert metric. Both forms have excellent internal consistency ($\alpha = .87$ for the SSRS-P, $.94$ for the SSRS-T, and $.95$ for the SSRS-T-A). The SSRS-P was considered a primary outcome variable in PFC and has been shown to be sensitive to both overall treatment effects and alliance in this context (Lerner et al., 2011; Mikami et al., 2010). Baseline SSRS-P, SSRS-T, and SSRS-T-A scores were used in this study as variables that are theoretically unrelated to parent group cohesion, while change in SSRS-P was used as a measure of predictive validity.

Parent satisfaction. At the end of PFC, parents completed a questionnaire to provide feedback about the usefulness of the treatment (Mikami et al., 2010). Three items were considered to capture the construct of client satisfaction with the group: "I feel this approach to treating children's friendship problems is," "how much did you yourself enjoy the group," and "would you recommend the program to a friend or relative who had a child with ADHD." These items were rated on a 5-point scale (*very inappropriate* to *very appropriate*, *did not enjoy at all* to *enjoyed very much*, and *strongly not recommend* to *strongly recommend*, 1 to 5 respectively). These three items were combined to create a composite client satisfaction measure ($\alpha = .81$). Parent satisfaction was thought to be moderately positively linked to group cohesion.

Development of the TPOCS-GC

The TPOCS-GC was designed to provide the field with a coding system capable of objectively describing individual participants' cohesion with their therapy group. The TPOCS-GC was developed via a five-step process.

Step 1. Scale focus. First, we reviewed the literature to identify the quality of group cohesion that would be represented in the scale. Our review revealed a prevailing view of group cohesion quality, suggesting it largely comprises the affective *bonding* aspects of the relationship between clients (Braaten, 1991; Johnson, 2007; Johnson et al., 2005; Joyce et al., 2007; Lorentzen, 2008; Piper, 1983; Yalom, 1995). Moreover, *bonding* can be conceptualized as comprising the presence of positive bonding behaviors as well as the absence of negative bonding behaviors (we do not consider these to be separate factors, but concurrent behavioral indicators of the same bonding factor). We therefore decided that the scale should focus on affective *bonding*.

Step 2. Item development. The second step was to develop items representing the affective bond. In accord with accepted psychometric practice, multiple sources were sampled when developing items for the TPOCS-GC. Because no well-validated observer-reported group cohesion scales exist, we sought to modify items from existing observational alliance measures designed to assess the bond in group psychotherapy. We used the TPOCS-A (McLeod & Weisz, 2005) because the (a) authors had conducted a comprehensive review of the literature and identified

Table 1
Item Means, Standard Deviations, Intra-Class Correlations, and Inter-Item Correlations for the Full TPOCS-GC

Item ^a	Mean (SD)	1	2	3	4	5	6	7	8
Item 1	2.26 (.90)	.83							
Item 2	4.97 (.17)	.17*	.70						
Item 3	2.77 (.83)	.71***	.25**	.76					
Item 4	2.23 (1.08)	.80***	.14	.57***	.90				
Item 5	4.96 (.16)	.16	.21*	.16	.13	.48			
Item 6	4.90 (.27)	-.30***	.12	-.17*	-.20*	-.05	.74		
Item 7	4.98 (.09)	.10	.08	.18*	.08	.43***	.07	-.03	
Item 8	2.62 (.79)	.63***	.11	.63***	.60***	.08	-.09	.10	.86

Note. TPOCS-GC = Therapy Process Observational Coding System-Group Cohesion scale; SD = standard deviation.

Diagonals represent ICC(1,2), all values below diagonals represent 2-tailed Pearson correlations. **Bold items** represent final scale items. Item 2 = To what extent did the client act in a hostile, critical, or defensive manner toward the other clients; Item 3 = To what extent did the client demonstrate positive affect toward the other clients; Item 4 = To what extent did the client share his/her experience with the other clients; Item 5 = To what extent did the client appear anxious or uncomfortable when interacting with the other clients; Item 6 = To what extent did the client and the other clients maintain a professional working relationship; Item 7 = To what extent did the client and the other clients appear anxious or uncomfortable interacting with one another; Item 8 = To what extent did the client and the other clients' interaction appear alive and energetic.

^aItem 1 = To what extent did the client indicate that s/he experiences the other clients as understanding and/or supporting.

* $p < .05$. ** $p < .01$. *** $p < .001$.

items that represented the *bond* and (b) wording and structure of the items had already been adapted for observational coding of group therapy (i.e., reliability as well as variance across and within therapy sessions and modalities; Lerner et al., 2011; Liber et al., 2010).

We took the TPOCS-A bond items and modified them for group cohesion by replacing “the therapist” with “another client” (i.e., any other client). Then we examined existing self-report group cohesion measures such as the Therapeutic Factors Inventory-Cohesiveness subscale (Lese & MacNair-Semands, 2000), Piper’s (1983) measure of basic bonds, and the Group Questionnaire (Burlingame, 2010; Krogel, 2008) to ensure the modified items reflected the common bond components in group cohesion. See Table 1 for item list. Descriptions were added to each item to ensure relevance to PFC. For instance, item 4 description was as follows: “How often the client shares his/her experience when asked by the other clients; this should only be scored if this sharing is explicitly towards or in response to another client.”

Step 3. Scoring strategy. Because the TPOCS-A was previously modified to assess the alliance in youth (Liber et al., 2010) and parent (Lerner et al., 2011) group-focused psychotherapy, and because this modification permitted the assessment of each individual’s behavior within the group (facilitating assessment of member-group structure), the same scoring strategy was used. Coders were assigned to code individual clients within each session (i.e., each unit of coding was a client-session). Coders were instructed to consider only the target individual to be “the client,” and all other nontherapists in the room to be “the other clients.” To isolate horizontal member-group structure, the TPOCS-GC states, “group cohesion items should only be scored if it is explicitly clear that the behavior is being directed towards another client or the group in general, as opposed to the therapist.” This strategy was used to capture within-group variability in member-group cohesion. For instance, groups may contain clusters of individuals who are particularly well-bonded to the group, or individuals who are excluded from an otherwise cohesive group. Coders observed entire therapy sessions and rated each item on a 6-point scale ranging from 0 (*not at all*) to 5 (*a great deal*).

Step 4. Pilot coding. A random subset of tapes from PFC sessions 1 and 2 (20 client-sessions) was used to establish preliminary reliability; all coders rated each of these client sessions independently. Interrater reliability of each item was assessed, and those items that demonstrated low reliability were refined. During the piloting phase, coders provided feedback on item content and definitions, which was used to refine the TPOCS–GC.

Step 5. Research applications. After the scale was piloted, the TPOCS–GC was used to code all 144 client-sessions from PFC sessions three through eight for all groups.

Coder Training and Scoring Procedure

To ensure that coders were properly trained and minimize coder drift, we used the following procedures to generate scores on the TPOCS measures.

Coders. The coding team comprised seven undergraduate psychology students. All coders assessed both TPOCS–A and TPOCS–GC concurrently and were naïve to treatment outcomes, session order, and specific study hypotheses.

Coder training. The coding team trained over a 2-month period. Training comprised reading the scoring manuals, attending meetings, reviewing specific session segments, and practice coding. For the TPOCS–A, coders trained by first meeting adequate (Cicchetti, 1994) prestudy reliability ($ICC > .59$) on separate youth-focused sessions. Next, coders trained and met adequate prestudy reliability on a subset of PFC tapes using the TPOCS–A and TPOCS–GC. As all coders scored the same tapes during training, reliabilities were calculated using $ICC(2,7)$; Shrout & Fleiss, 1979). During coding, weekly reliability assessments were performed and results were discussed in weekly meetings (Margolin et al., 1998).

Scoring of therapy sessions. All client-sessions were double-coded by independent coders, with coder assignment randomized and counterbalanced such that each coder was paired with each other coder an equal number of times³. All sessions in which a client attended in person or by phone were coded. $ICC(1,2)$ was calculated for reliability, and the average of each pair of codes for each item was used in subsequent analyses.

Analytic Plan

Each client contributed up to six cohesion observations (from sessions 3–8). Observations from session three were used to represent “early” cohesion, while those from session 8 were used to represent “late” cohesion. We used session three as “early” cohesion for two reasons. First, previous research suggests that early alliance building occurs through the first three sessions (Baldwin, Wampold, & Imel, 2007; Bourgeois, Sabourin, & Wright, 1990; Shirk, Gudmundsen, Kaplinski, & McMakin, 2008) and cohesion (Bakali et al., 2009). Second, in PFC, the first two sessions are designed to “set a foundation” for subsequent work (Mikami et al., 2010), during which participant relationships may be stabilizing. As such, we wanted to ensure that the index of cohesion represented a stable early indicator of the relationship for each participant. Additionally, an ordinary least squares regression line was fit for each individual through their observed time points, and an unstandardized regression coefficient (B) was generated for each case. In each analysis, we used a single cohesion score per case: early cohesion, late cohesion, or change in cohesion over treatment (B).

We adopted a four-step approach to data analysis. First, we investigated the psychometric properties of the TPOCS–GC. We examined interrater reliability, internal consistency, and effects of nesting and stability over time. For these latter analyses, we used 3-level unconditional and

³The only exception was a coder who was not assigned to any tapes containing a client with whom the coder had previous personal contact.

time-only hierarchical linear modeling (HLM; Guo, 2005) to account for the fact that group cohesion data in this sample were multiply nested: multiple observations (level 1) were nested within individuals (level 2), who were nested within treatment groups (level 3). We estimated the ICCs for TPOCS-GC variables, and, following Guo (2005), determined the levels at which we needed to account for significant variance; as total level 3 (between-treatment group) variance was <0.1% in all models, it was appropriate to proceed without including level 3 in subsequent models. The full two-level HLM models were specified as follows:

Level 1:

$$Y_{it} = \pi_{0i} + \pi_{1i}(Time) + e_{it}$$

Level 2:

$$\pi_{0i} = \beta_{00} + r_0$$

$$\pi_{1i} = \beta_{10} + r_1$$

(1)

Y_{it} is TPOCS-GC at a given time point for a given individual, $Time$ is the time point variable (representing sessions three through eight), π_{0i} is the intercept of the line, π_{1i} is the linear slope of the line over time, β_{00} and β_{10} are the estimated intercept and slope coefficients, e_{it} is the individual error term, while r_0 and r_1 represent the error in slope and intercept.

Second, we examined its correlation with theoretically linked variables (TPOCS-A, parent satisfaction). Third, we considered its discriminant validity by examining its correlation with theoretically unrelated parent (age, gender, education, income, parental role) and child (age, gender, IQ, baseline symptom severity, teacher-reported academic ability) variables. Finally, we considered its predictive validity by examining its relation with session attendance (Hawley & Weisz, 2005) and effects on change in a primary outcome variable from PFC (Mikami et al., 2010). We accomplished the former by conducting independent samples t test comparing TPOCS-GC of those who missed sessions with those who did not, as well as by correlating number of missed sessions with TPOCS-GC; we accomplished the latter by running hierarchical multiple regression models predicting endpoint social functioning, with baseline social functioning on step 1, and either early TPOCS-GC or change in TPOCS-GC on step 2. In terms of continuous missed session analyses, only those who did not attend sessions were included. This strategy was chosen because (a) the distribution is highly skewed if those with 100% attendance are included (affecting the interpretability of the regression model), and (b) the operative question in these analyses is the effect on number of missed sessions, not just whether sessions are missed, consistent with the extant literature's focus on attendance and retention variables (McLeod, 2011). Cohen's (1988) guidelines were used to characterize R^2 effect sizes.

Results

Psychometrics Properties of the TPOCS-GC

After the completion of coding, the interrater reliability of each TPOCS-GC item was assessed and those items that did not demonstrate adequate reliability (i.e., ICC below .40; Cicchetti, 1994) were dropped; this excluded item 7. See Table 1 for ICC's, means, standard deviations, and inter-item correlations of the TPOCS-GC items.

Next, we examined inter-item correlations and found that item 6 was, on average negatively correlated ($r = -.11$) with the remaining items, and so was dropped, leaving six items. While item 5 also displayed moderately low correlations with the remaining items, it was retained to ensure that the lack of negative bonding behaviors was represented. Doing so did not affect

overall scale reliability: the version without items 5 and 7 had $\alpha = .78$, the version without items 5, 6, and 7 had $\alpha = .83$, and the version without items 6 and 7 (final version) had $\alpha = .80$.

With items dropped, the final TPOCS-GC comprised six items (see Table 1). For these items, interrater reliability (ICC) ranged from .48 to .90 ($M = .75$, $SD = .15$); using Cicchetti's (1994) guidelines for assessing the acceptability of reliability levels, one of the six items fell in the "fair" range, one in the "good" range and four the "excellent" range. Average inter-item correlations were .36. The internal consistency of the TPOCS-GC was acceptable (see above), as were early ($\alpha = .86$) and late ($\alpha = .76$) TPOCS-GC scores. Correlation between early and late TPOCS-GC scores in this sample was $r = .30$ ($p < .19$). The TPOCS-GC did not display substantial ceiling effects or restricted range ($M = 3.30$, $SD = 1.30$).

Nesting and stability over time. We examined the effects of nesting in unconditional and time-only (including residuals) models of TPOCS-GC. Table 2 demonstrates the distribution of the variance components and the associated ICC. Significant variance (ICC >10%) existed at both the between-subject and within-subject level, indicating the need to model these effects in subsequent analyses (Guo, 2005). This stands in contrast to previous assertions that cohesion should be observationally measured at the overall-group level (Budman et al., 1989; McNeil, 2006).

These results also indicate that linear time had little effect (ICC < 1%) on TPOCS-GC in the time-only models, indicating little systematic linear change in observed alliance or cohesion over time. However, time-only models—including fixed and random effects of time—accounted for 34% and 30% of alliance and group cohesion, respectively, compared with unconditional models. This indicated substantial individual difference in trajectories over time.

We examined a time-only model to assess whether cohesion systematically increased over time; as with the three-level models, TPOCS-GC ($\beta_{10} = .0069$, $p < .76$) did not reveal a significant linear trend over time.

Predicted Correlations

Table 3 presents correlations between TPOCS-GC and theoretically linked variables. The TPOCS-GC and TPOCS-A were strongly correlated early, late, and overall ($r = .62$, $p < .001$), as were change in TPOCS-GC and TPOCS-A over treatment. These findings indicate that the measures may be tapping into distinct but related constructs. Contrary to our hypothesis, TPOCS-GC was unrelated to parent-reported post-PFC satisfaction with the group.

Discriminant Validity

Table 4 presents correlations between TPOCS-GC and theoretically unlinked variables. As expected, TPOCS-GC was not related to parent age, gender, education, income, parental role, child IQ, or teacher-reported academic ability. Contrary to expectations, higher early TPOCS-GC was positively related to child age, while increases in TPOCS-GC were negatively related to child age. Also, parents of boys appeared to have higher TPOCS-GC at the end of treatment relative to parents of girls ($M_{boys} = 3.63$, $SD_{boys} = .11$; $M_{girls} = 3.18$, $SD_{girls} = .14$). Additionally, parents of youth with higher baseline teacher-reported social problems demonstrated relatively greater increases in group cohesion. These findings suggest that the TPOCS-GC discriminated effectively from most theoretically distinct constructs.

Predictive Validity

Independent samples *t* tests indicated that alliance, early cohesion, and change in cohesion were unrelated to whether participants missed sessions (see Table 3). However, those who missed sessions exhibited significantly lower late cohesion than those who did not ($M_{Missed} = 3.22$, $SD = .49$; $M_{NoMissed} = 3.63$, $SD = .40$). Early TPOCS-GC predicted a significant decrease in SSRS-P ($\beta = -.33$, $p = .02$) such that parents who displayed high group cohesion at PFC session three reported significant decreases in their children's social skills over the course of the intervention.

Table 2
Multilevel Variance in Observed Alliance and Group Cohesion

	Unconditional model				Time only (with residuals)									
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Total ICC	Total ICC	Total ICC		
σ^2 (ICC)	τ_π (ICC)	τ_π (ICC)	τ_β (ICC)	σ^2 (ICC)	$\tau_{\pi 0}$ (ICC)	$\tau_{\pi 1}$ (ICC)	$\tau_{\pi 2}$ (ICC)	$\tau_{\pi 0}$ (ICC)	$\tau_{\pi 1}$ (ICC)	$\tau_{\pi 2}$ (ICC)	$\tau_{\beta 0}$ (ICC)	$\tau_{\beta 1}$ (ICC)	$\tau_{\beta 2}$ (ICC)	Total ICC
TPOCS-A ^a	.098 (.25)	.30 (.75)	.00004 (<.001)	.09 (.35)	.17 (.65)	.00055 (.002)	.00003 (<.001)	.65	.00003 (<.001)	.00001 (<.001)	.00001 (<.001)	.00015	.00038	.00015
TPOCS-GC	.22 (.38)	.36 (.62)	.00005 (<.001)	.21 (.28)	.55 (.72)	.0006 (<.001)	.00029 (<.001)	.72	.00029 (<.001)	.00	.00	.00	.00	.00038

Note. σ^2 = Level 1 (within-subject) variance. τ_π = Level 2 (between-subject) variance. τ_β = Level 3 (between-group) variance. $\tau_{\pi 0}$ = Level 2 intercept variance (between-subject individual difference in intercept). $\tau_{\pi 1}$ = Level 2 slope variance (between-subject individual difference in slope). $\tau_{\pi 2}$ = Level 3 intercept variance (between-group individual difference in intercept). $\tau_{\beta 1}$ = Level 3 group variance (between-group individual difference in slope). ICC = intraclass correlation (% of total variance in the model accounted for by the given variance component).

^aAlliance variance derived in Lerner et al., 2011.

Table 3
Correlation Matrix Showing Relationships Between Group Cohesion and Theoretically Related Variables

	Early TPOCS-GC	Late TPOCS-GC	Change in TPOCS-GC	Early TPOCS-A	Late TPOCS-A	Change in TPOCS-A
Early TPOCS-A	.69***	.05	-.51*	-	.43	-.25
Late TPOCS-A	.19	.49*	.10	.43	-	.62**
Change in TPOCS-A	-.32	.09	.59***	-.25	.62**	-
Parent satisfaction	-.33 ⁺	-.10	.10	.05	.25	.21
Missed session (yes/no) ^a	.36	2.19*	.96	.10	1.60	.18
No. of missed sessions	-.43 ⁺	-.46 ⁺	.01	-.25	-.50	-.37

Note. TPOCS-GC = Therapy Process Observational Coding System-Group Cohesion Scale; TPOCS-A = Therapy Process Observational Coding System for Child Psychotherapy-Alliance Scale. All correlations are 2-tailed.

^aValues in this row represent independent-samples *t* tests.

⁺ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Correlation Matrix Showing Relationships Between Group Cohesion and Alliance (Early, Late, and Change) and Theoretically Unrelated Variables (Discriminant Validity)

	Early TPOCS-GC	Late TPOCS-GC	Change in TPOCS-GC	Early TPOCS-A	Late TPOCS-A	Change in TPOCS-A
Parent age	.30	.36	-.14	.35	.24	-.26
Parent gender ^a	.20	.25	.14	.68	.02	1.02
Parent education	.26	.26	-.21	.09	-.21	-.39*
Parent income	.14	.18	-.03	.31	.36	-.10
Parental role ^a	.49	.19	.37	.76	.07	.08
Child age	.53**	-.09	-.48*	.47*	.04	-.18
Child gender ^a	.01	6.2*	1.75	.74	.28	.62
Child GAI	.20	.24	-.22	.37	.50*	.13
Conners-T	.01	.03	.08	-.03	-.24	-.04
Conners-P	.02	-.15	.03	-.00	-.10	.09
CBCL-Social	.16	.19	.18	.13	.23	.23
TRF-Social	-.28	.32	.55**	-.20	.20	.37 ⁺
SSRS-P	.07	-.04	-.23	.03	-.01	-.09
SSRS-T	-.02	.00	-.16	.04	.30	.15
SSRS-T-A	.05	-.06	-.02	.35	.38	.24

Note. GAI = General Abilities Index of intelligence; Conners-T & P = Conners ADHD Index, Teacher & Parent Forms; QPQ = Quality of Play Questionnaire; CBCL-Social = Child Behavior Checklist-Social Problems; TRF-Social = Teacher Report Form - Social problems; SSRS-P & -T = Social Skills Rating System, Parent & Teacher Forms; SSRS-T-A = SSRS-T-Academic Ability. All correlations are 2-tailed.

^aAnalysis run is univariate ANOVA between conditions, statistic reported is *F*-test.

⁺ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

This effect size was medium ($R^2 = .11$). Change in TPOCS-GC predicted a significant increase in SSRS-P ($\beta = .32, p = .02$) such that parents who increased more in observed group cohesion reported increases in their children's social skills. This effect size was medium ($R^2 = .10$).

Discussion

In this study we presented a new observational measure of group cohesion, the TPOCS-GC, and considered its potential to fill a measurement gap in the psychotherapy field. The TPOCS-GC was developed to provide an objective description of group cohesion in group-based psychotherapy. Overall, this study provides good evidence for the internal consistency and reliability of the TPOCS-GC, good evidence for its relation to theoretically linked variables, as well as discriminant validity, and fair evidence for its predictive validity. Thus, the TPOCS-GC appears to be a reliable instrument that has the potential to help expand understanding of the role group cohesion plays in group psychotherapy.

Psychometric findings suggest that the TPOCS-GC has several strengths. The TPOCS-GC was tested over time in a group parent-training intervention for children with ADHD. Results suggested coders could reliably characterize group cohesion at the item level, and the scale showed acceptable internal consistency. Indeed, interrater reliability was comparable to average interrater reliability for child (.77; McLeod, 2011), parent (.74; McLeod, 2011), and adult (.77; Martin, Garske, & Davis, 2000) observational alliance measures. Consistent with previous literature examining group cohesion over time (Woody & Adessky, 2002), the TPOCS-GC demonstrated moderate aggregate stability. Together, these findings indicate that the TPOCS-GC is a reliable instrument.

Results provide some preliminary support for the validity of the TPOCS-GC. In terms of correlations with theoretically linked variables, alliance and group cohesion (measured by the same coders) were strongly ($r \sim .62$) correlated at multiple time points and over time. Magnitude of these correlations is comparable to some correlations found using self-report measures (using the same client to report on alliance and cohesion; Johnson et al., 2005; Marziali et al., 1997), but somewhat higher than others (Joyce et al., 2007; Lorentzen et al., 2004). Overall, findings provide mixed support for the correlation of the TPOCS-GC with theoretically linked variables.

With regard to discriminant validity, as predicted we did not find a relation between group cohesion and various demographic factors (e.g., parent age, gender) or child clinical factors (e.g., baseline symptom severity measures). However, child age positively correlated with early group cohesion, and negatively correlated with change in group cohesion. Past studies have found similar relations between child age and alliance in child-focused psychotherapy (McLeod & Weisz, 2005). Additionally, parents of boys showed greater late group cohesion. As is typical in ADHD populations, there were many more families of boys than girls in PFC groups; thus, it may have been more difficult for girls' parents to develop a cohesive relationship via shared similar experiences. Finally, parents of youth with more teacher-reported social problems experienced greater increases in cohesion. This suggests that common experiences of more severe youth social problems may promote bonding in PFC parent groups. Future research should consider factors that parents bring to treatment (e.g., treatment expectations, shared treatment-relevant experiences, and pretherapeutic dispositions; Dinger & Schauenburg, 2010) that may help explain relations between demographic factors and group cohesion.

Turning to research applications, our findings provide mixed support for the potential utility of the TPOCS-GC for research on group cohesion in parent psychotherapy. As predicted, those who missed sessions demonstrated lower late group cohesion (but not alliance), which is notable since coders were blind to session order. This suggests that poor cohesion may uniquely reflect a failure to establish strong member-group bonds when participants miss sessions.

Interestingly, we found mixed results for the relation between group cohesion and social skills. As expected, change in group cohesion predicted a significant increase in parent report of child social skills. This suggests that increases in observed group cohesion may indeed represent a therapy process that contributes to clinical improvements in these groups. However, early group cohesion predicted a significant decrease in such skills. It is possible that parents with high early cohesion may have experienced inflated expectations that led to subsequent lower reports of

social skills. However, we provide this interpretation with caution, and further consideration of factors contributing to this effect is warranted.

In developing the TPOCS-GC, we focused upon member-group structure, which allowed us to investigate between-group and between-individual group cohesion variance. Whereas we found little between-group variance, considerable between-individual (and within-individual over time) variability was observed. This finding suggests that there may be individual differences in group cohesion within groups (Bakali et al., 2009; Marziali et al., 1997), which suggests that group cohesion may be best conceptualized as a member-group construct. It also indicates that cohesion may represent a nonlinear process over the course of treatment, highlighting the importance of measuring it repeatedly and assessing its dynamics over time.

The TPOCS-GC is not designed to measure member-member cohesion. Our findings therefore cannot speak to whether member-group or member-member structure best represents group cohesion. This represents an important area for future research. Our decision to focus upon member-group was influenced by trends in cohesion research and methodological concerns. Conducting reliable observation of groups is time-intensive and it would be impractical to observe individual relationships between each member of the group.

In terms of group cohesion quality, the TPOCS-GC was designed to capture the common "affective bonds within groups" characterization (Joyce et al., 2007). While the TPOCS-GC considered the most prominent model of group cohesion (bond-focused), there remain disagreements about such models. As such, the TPOCS-GC may not apply to other models of group cohesion quality (Burlingame et al., 2011). However, as TPOCS-GC is an observational measure designed to assess the most consistent component of group cohesion quality, it may aid the field and future measure development by reducing definitional variability.

Overall, these data indicate that the TPOCS-GC preliminarily demonstrates several psychometric strengths and suggest that the measure may help describe and study cohesion in group psychotherapy. Indeed, the TPOCS-GC is the first observer-reported measure designed to assess individual differences in member-group cohesion within and between groups. Additionally, the overlap between the TPOCS-GC and the alliance was comparable to past studies (Johnson et al., 2005; Marziali et al., 1997), though common method factors may have inflated this correlation. The ability to distinguish between these constructs is an important quality given the putative similarity between therapy processes in group therapy (e.g., Yalom, 1995). The TPOCS-GC therefore has the potential to fill a measurement gap in the field.

This measure may expand understanding of the role therapy processes play in group-based interventions. Due to their cost-effectiveness and relative ease of dissemination, such interventions have proliferated across literatures (Minjarez, Williams, Mercier, & Hardan, 2011; Shechtman & Mor, 2010). Use of reliable measures for determining group therapeutic relationship processes that may contribute to outcomes will help accelerate the pace of intervention development and optimization. That said, the TPOCS-GC itself presents several costs and benefits. On the one hand, to be used reliably, it requires well-trained coders and is somewhat time-consuming. On the other, it affords greater reliability, better applicability across modalities, and greater confidence that the same construct is captured in each administration when measuring group cohesion.

This preliminary study provides a foundation for future research using the TPOCS-GC. The TPOCS-GC can play an important role in clarifying definitional issues in the field. The development of an observational group cohesion measure allows researchers to address the problem of common method measurement confounds. As addressing method variance is an important component of establishing construct validity, it is important for future research to use both observer-reported and self-report cohesion measures. Such research should consider the relation of observer-reported and self-report group cohesions measures to establish convergent validity. Additionally, research can examine which treatment outcomes may be differentially predicted by observed versus self-report group cohesion. Future research can also attempt to clarify the relation between related constructs such as group cohesion, group climate, and the alliance to consider whether they may be disentangled.

Practically, clinicians may consider using this tool to more objectively assess relationships between members and the group (which may be difficult to accurately evaluate during sessions). Clinicians could also compare self-report and observed cohesion to determine whether clients'

bonding behaviors match their perceptions—a key challenge in many disorders. Finally, empirical research about the benefits of observer-rated group cohesion may be useful for clinicians to identify and encourage group members' cohesion-related behaviors that have been empirically demonstrated to promote positive therapy outcomes.

A number of methodological limitations of this preliminary study bear mentioning. First, we were not able to examine relations with established self-report group cohesion measures. As such, our findings do not address the convergent validity of the measure. Second, observational measures cannot capture covert aspects of perceived relationships, so may not capture all facets of group cohesion. Third, our small sample may yield less precise estimates, so this should be taken into consideration when interpreting the findings. Fourth, the small number of parent groups limited our ability to model cohesion at the group level, which future studies can address by including a larger number of groups. Fifth, the same coders were used to measure alliance and group cohesion, which may have inflated the relation between alliance and group cohesion.

Sixth, the majority of the participants were female, which may influence the generalizability of these findings to other groups. However, we note that most participants in parenting groups are mothers (e.g., Kazdin et al., 2006), making the current sample representative of clinical practice. Seventh, item 5 evinced a fairly low ICC(.48). While this was sufficient to warrant its inclusion in the final scale, it is nonetheless possible that this item as it stands may not be satisfactorily reliable, and future coders may require additional clarification in how to code it reliably. Finally, this measure has been applied only to one form of group therapy (parent training) for a specific problem (social functioning) and a particular population (youth with ADHD). Future research should use the TPOCS-GC in a wider range of youth-focused and adult-focused therapeutic modalities to determine its broader applicability and validity.

Conclusion

In sum, this study introduced the first reliable, psychometrically assessed observational measure of group cohesion. Such a measure not only has the potential to fill a research gap, it also may have clinical implications. First, in parent training, it indicates that there may exist an observable group-level and individual-level process of group bonding between parents that is dissociable from the alliance. Second, it suggests that such processes may be considered and examined in group-based psychotherapy more broadly. Therapists would be well-served to take group cohesion into account when considering clinical group composition. Likewise, there may be actions that therapists may take to enhance or erode such cohesion within groups. The TPOCS-GC may aid therapists in examining techniques to enhance cohesion. Likewise, it can be a helpful tool for researchers seeking to use, in concert with self-report, a more objective and reliable measure of a complex relationship variable in group psychotherapy.

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