Adolescent and Parent Alliance and Treatment Outcome in Multidimensional Family Therapy

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In this study, the authors examined the relation between adolescent and parent therapeutic alliances and treatment outcome among 65 substance-abusing adolescents receiving multidimensional family therapy. Observer ratings of parent alliance predicted premature termination from treatment. Observer ratings, but not self-report, of adolescent alliance predicted adolescents' substance abuse and dependency symptoms at posttreatment, as well as days of cannabis use at 3-month follow-up. The association between adolescent alliance and substance abuse and dependency symptoms at posttreatment was moderated by the strength of the parent alliance. Results reveal the unique and interactive effects of the 2 alliances on treatment outcome and emphasize the need for a systemic and well-articulated approach to developing and maintaining the multiple alliances inherent to family therapy.

Keywords: alliance, adolescents, family therapy, substance abuse

The working alliance between the client and therapist has long been considered a key ingredient in successful psychotherapy (Bordin, 1979). Over the past 25 years, a tremendous amount of research has accumulated indicating that the quality of the therapeutic alliance, or the degree to which the client and therapist care about one another and agree on the goals and tasks of therapy, is a modest yet robust predictor of treatment outcome in individual psychotherapy with adults (Horvath, 1994, 2000; Horvath & Luborsky, 1993; Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). The alliance has been shown to account for between 5% and 7% of the variance in treatment outcome across a wide range of treatment approaches, clinical populations, and outcome parameters (Horvath, 1994, 2001; Horvath & Symonds, 1991; Martin et al., 2000). In adult samples, the alliance—measured early in therapy—is a slightly better predictor of outcome than alliance measured in midtherapy or averaged across the course of treatment (Horvath, 1994, 2001; Horvath & Symonds, 1991). Overall, the strength of the alliance has been shown to predict

outcome better than the type of therapy administered, the length of the treatment, or any other single aspect of the therapy process (Orlinsky, Grawe, & Parks, 1994).

In contrast to the extensive empirical work examining the alliance-outcome link in therapy with adults, there has been a relative paucity of such research in treatment with children and adolescents (Kazdin, Siegel, & Bass, 1990; Shirk & Saiz, 1992). A recent meta-analysis, covering the years 1973–2000, included only 18 published studies and five unpublished doctoral dissertations that investigated the association between the therapeutic relationship and outcome among children and adolescents (Shirk & Karver, 2003). Results revealed a mean correlation of .24, a figure almost identical to that found in adult samples. However, two findings differed substantially and meaningfully from those reported in the adult literature. First, although the client's self-report of the alliance has been found to be most predictive of outcome in studies on adults, Shirk and Karver (2003) reported that the therapist's and parent's ratings of the child or adolescent alliance were more highly associated with treatment outcome than was the child's or adolescent's self-report. It has been suggested that this phenomenon may be attributable to children's and adolescents' particularly high ratings of the alliance, which may result in a ceiling effect and, consequently, a decrease in the predictive validity of such scores (Kendall et al., 1997). Second, although alliance assessed early in treatment has been found to be most predictive of treatment outcome in adult studies, Shirk and Karver reported a correlation of only .12 between early alliance and outcome, and a larger correlation of .27 between alliance measured late in therapy and treatment outcome. Although the reasons for such disparate findings are not clear, Shirk and Karver (2003) conclude that, to date, ". . . there is very little support for a *predictive* association between relationship variables and outcomes" (p. 461) for this age group.

Clearly, additional research on the alliance with adolescents is required. In particular, there is a need for research on the alliance with adolescents evidencing externalizing behaviors, such as delinquency and substance abuse. This is because such adolescents are typically referred or mandated to treatment by others. They often approach therapy reluctantly and with negativity (Robbins, Alexander, Newell, & Turner, 1996; Taylor, Adelman, & Kaser-Boyd, 1985). Not only does this make alliance formation with this population more challenging but, ironically, it may also make it more critical to treatment outcome (Coatsworth, Santisteban, McBride, & Szapocznik, 2001; G. M. Diamond, Liddle, Hogue, & Dakof, 1999; Liddle, 1995; Liddle & Diamond, 1991; Shirk & Karver, 2003; Szapocznik et al., 1988). Indeed, Shirk and Karver (2003) found that the therapeutic relationship was more predictive of treatment success among children and adolescents with externalizing symptoms than those with internalizing symptoms. In perhaps the largest and most methodologically sound study conducted to date on adolescents, investigators found that among the 600 adolescents who received one of five different types of substance-abuse treatments in the context of the Cannabis Youth Treatment (CYT) study (Dennis, Titus, et al., 2002), their self-report of the alliance—measured early in treatment—predicted their substance use and substance-related problems at 3- and 6-month follow-ups (Tetzlaff et al., in press). Despite the fact that the CYT included five different treatments (both individual and family based), between-treatment differences were not examined.

In this study, we examined the association between the adolescent–therapist and parent–therapist alliances, treatment attrition, and outcome in one of the CYT family therapy conditions: multidimensional family therapy (MDFT; Liddle, 2002b). MDFT is a 12-week, multisystemic, ecological, manualized family-based approach for treating adolescents who abuse substances. Its theoretical roots are in the integrative structural–strategic family therapy tradition (Fraser, 1982; Stanton, 1981; Todd, 1986). The overall goals for treatment are based on empirical research on normative adolescent development and developmental psychopathology. It addresses the multiple subsystems in which people reside (e.g., individual, marital, parental, extrafamilial, peer, sibling), both within and beyond the context of the family. Several randomized clinical and prevention trials have established the efficacy of MDFT with moderate-to-severe drug-abusing adolescents (U.S. Department of Health and Human Services [USHHS], 2002; Waldron, 1997; Weinberg, Rahdert, Colliver, & Glantz, 1998). In addition, findings from the CYT study show that MDFT was as effective as other standardized drug treatments at reducing adolescents' drug use and drug-related symptoms (Dennis et al., 2004).

Investigating the role of the therapeutic alliance in family therapy is important for a number of reasons. First, a large portion of adolescents exhibiting externalizing symptoms, such as substance abuse and delinquency, receive family-based interventions. Second, there is substantial empirical support for family-based intervention models with this population (Alexander, Holtzworth-Munroe, & Jameson, 1994; G. S. Diamond & Josephson, in press; Liddle & Dakof, 1995; Stanton & Shadish, 1997). Third, the fact that family-based models involve multiple participants and, consequently, require the development and maintenance of multiple alliances (i.e., adolescent–therapist, parent–therapist) raises important clinical questions regarding the unique role of each alliance in the therapy process, as well as the interactive effect between the

alliances. Some authors have pointed out the importance of forming an alliance with the parent(s) of adolescents exhibiting behavior disorders, because parents are typically the ones who bring the adolescent to treatment, who are most interested in change, and who bear the most leverage to create change (Pinsof & Catherall, 1986). Others have emphasized the importance of simultaneously building an alliance with the adolescent. They suggest that for treatment to be successful, the therapist must incorporate the adolescent's concerns and desires into the treatment process. It is only when the adolescent trusts that the therapist understands and acknowledges his or her trials and aspirations, and therapy is transformed into a personally meaningful endeavor, that treatment can be successful (Liddle, 1995). Most likely, each alliance bears some impact on one or more aspects of treatment outcome. Furthermore, systems theory suggests a likely interactive effect between the various alliances (Pinsof & Catherall, 1986). That is, the strength of one alliance likely moderates the impact of the other on treatment outcome. A sufficiently strong parent–therapist alliance may be necessary to potentiate the effect of a moderate-to-high adolescent–therapist alliance, and vice versa.

In this study, we examined the degree to which the strength of the adolescent–therapist and parent–therapist alliances, measured early in MDFT, were associated with treatment attrition, adolescents' days of cannabis use, and substance abuse and dependency symptoms, at the end of 12 weeks of treatment and at 3-, 6-, and 9-month follow-ups. We assessed adolescent alliance using both adolescents' self-report and observer ratings. We also assessed parent alliance using observer ratings only. One of the first goals of this study was to examine whether adolescents' self-report of the alliance or whether observer ratings were more strongly associated with outcome. On the basis of prior research on both adolescents (Kendall, 1994) and adults who abuse substances (Fenton, Cecero, Nich, Frankforter, & Carroll, 2001) showing that these populations report unusually high ratings for the alliance, and on the basis of prior findings among adults who abuse substances indicating that observers' ratings were a more valid predictor of outcome than clients' self-report of alliance (Fenton et al., 2001), we predicted that observer ratings of the adolescent alliance would be more predictive of treatment outcome than adolescents' self-report. A second goal was to examine whether either or both of the alliances (i.e., adolescent–therapist, parent–therapist) were associated with premature termination from treatment. A prior study by Robbins, Turner, Alexander, and Perez (2003) found that although the absolute strength of each alliance did not predict whether families completed or dropped out of treatment, discrepancies between the two alliances did. We predicted an interaction effect, in which the association between each alliance and treatment completion would be dependent on the strength of the other alliance. Finally, we examined the relative strength of the association between each alliance and adolescents' drug-using behavior, above and beyond, and in interaction with, the other alliance. We predicted that each alliance would be associated with posttreatment levels of substance use and substance abuse and dependency symptoms, above and beyond the contribution of the other alliance. We also predicted, on the basis of MDFT theory (Liddle, 1995) and clinical experience, that the association between each alliance and adolescents' cannabis use and substance abuse and dependency symptoms would be moderated by the strength of the other alliance. More specifically, we predicted that the effect of a

strong adolescent or parent alliance would be potentiated when the other alliance was of moderate or high strength.

Method

Participants

Clients. Clients were drawn from the CYT study (Dennis, Titus, et al., 2002). The CYT study was funded by the Center for Substance Abuse Treatment (Rockville, Maryland) and is the largest clinical trial for adolescents who abuse substances conducted to date. During a 2-year period, adolescents and their families were recruited and randomized from sequential admissions to five different treatments administered at four different treatment sites across the country. To be included in the CYT study, clients must have (a) been between the ages of 12 and 18 years, (b) self-reported one or more *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994) criteria for cannabis abuse or dependence, (c) used marijuana in the past 90 days (or 90 days prior to being in a controlled environment), (d) met the American Society of Addiction Medicine's (1996) patient placement criteria for Level I (outpatient) or Level II (intensive outpatient), and (e) had a primary caretaker willing to participate in the assessments and treatment if randomized to a family-based condition. Potential clients were excluded if they (a) had used alcohol 45 or more days of the 90 days prior to intake (or prior to being in a controlled environment), (b) had used other illicit drugs 13 or more of the 90 days prior to intake, (c) had an acute medical or psychological condition that prohibited full participation in treatment (e.g., severe depression or suicidal ideation), (d) appeared to have insufficient mental capacity to understand the consent form and/or participate in treatment, or (e) had a history of violent behavior or severe conduct disorder.

In the course of the CYT study, 100 adolescents who abused substances and their families received MDFT in one of two major U.S. cities: One was located on the east coast and the other in the midwest. These clients were primarily male adolescents (85%). Of the clients, 47% were White, and another 47% identified themselves as African American. Their average age was 16 years (range = 13–18 years). A total of 89% were enrolled in school, and 67% were under the supervision of the juvenile justice system. In addition, 52% were from single-parent families. We assessed socioeconomic status using the percentage of poverty index developed by Hollingshead and Redlich (1958). Of the participants, 20% were classified as very poor, 19% as poor, 39% as working class, 12% as upper-middle class, and 9% as upper class. A full 100% qualified for a *DSM–IV* (American Psychiatric Association, 1994) diagnosis of either substance abuse or dependency based on self-report only (86%) or a combination of self-report and collateral report (14%). A total of 64% evidenced clinical levels of externalizing symptoms, and 30% evidenced clinical levels of internalizing symptoms.

Therapists. Three therapists administered MDFT. All three had at least 5 years of previous clinical experience. Two of the therapists were master's-level clinical social workers, and one was a doctoral-level clinical psychologist. Two were men, and one was a woman. One man was African American, and the other two therapists were White. Their ages ranged from 35 to 40 years. All three clinicians received at least 1 year of supervised training in MDFT before treating study cases. Training sessions were taped and then reviewed by the clinical coordinator. Therapists were assigned cases only after they were certified as proficient in MDFT. Weekly supervision continued throughout the study and included the review of at least two therapy tapes per month to prevent therapist drift. During tape reviews, the clinical coordinators completed treatment-specific rating forms to monitor adherence and provide feedback to therapists.

Alliance raters. Raters were 10 undergraduate behavioral science students, ranging in age from 23 to 26 years. The group consisted of 3 men and 7 women.

Treatment

MDFT is a 12-week, family-based, multisystemic approach to treating adolescents who abuse substances. It is a carefully constructed, manualized, empirically based clinical model (Liddle, 2002b; Liddle & Diamond, 1991). The overall goals for treatment are based on empirical research on normative adolescent development and developmental psychopathology. Adolescent substance abuse is understood as existing in a context of other, interrelated problems, such as poor relationships, deficits in cognitive and problem-solving skills, learning and school difficulties, low self-esteem, family stress or dysfunction, and movement onto a trajectory of failure and incompetence. In accordance with research findings on parenting and family environments associated with adolescent drug use (Baumrind, 1991), MDFT focuses on issues such as interdependence (Steinberg, 1990) and autonomy connectedness (Grotevant & Cooper, 1983) in the parent–adolescent relationship. Moreover, all problem definitions and respective interventions and change processes are conceived of as multifaceted (e.g., cognitive, affective, behavioral, temporal). The specific goals of treatment are derived from each family's unique presentation. However, in every case one of the first and most important treatment goals is to develop strong therapeutic alliances with the parent(s) and with the adolescent. A number of clinical trials have indicated that MDFT is superior or equal to other types of well-established drug-abuse treatments (e.g., cognitive–behavioral therapy, adolescent group therapy) at improving a number of target areas (e.g., drug use, problem behaviors, family functioning) by termination and at follow-up (Dennis et al., 2004; Liddle, 2002a, 2002b; Liddle et al., 2001; Liddle, Rowe, Ungaro, Dakof, & Henderson, 2004; USHHS, 2002).

Instruments

Adolescent–therapist self-reported alliance. We measured adolescent self-report of the alliance using the short version (Tracy & Kokotovitc, 1989) of the Working Alliance Inventory (WAI; Horvath & Greenberg, 1986). The short version of the WAI is a 12-item scale, including three subscales: agreement on tasks (e.g., "My therapist and I agree about the things I will need to do in therapy to help improve my situation"), agreement on goals (e.g., "My therapist and I are working toward goals that we both agree on"), and development of bonds (e.g., "My therapist and I trust one another"). Each item is rated on a 7-point Likert-type scale. The WAI is the most commonly used self-report alliance scale and has demonstrated excellent reliability and validity (Horvath, 1994; Tichenor & Hill, 1989). In the current study, the full-scale WAI score was used.

Adolescent–therapist and parent–therapist observer-rated alliance. We assessed observer ratings of the two alliances using a revised version (VTAS-R; G. M. Diamond, Liddle, Dakof, & Hogue, 1996) of the Vanderbilt Therapeutic Alliance Scale (VTAS; Hartley & Strupp, 1983). The original VTAS is an observation-based measure consisting of 44 items, scored on a 6-point Likert-type scale, designed to measure the strength of the therapist's contribution, the patient's contribution, and the contribution of the therapist–patient interaction to the alliance. The revised version includes only the 24 items appearing on the patient contribution (i.e., "To what extent did the patient acknowledge that he had a problem which the therapist could help him with") and therapist–patient interaction (i.e., "To what extent did the therapist and patient agree on the goals and tasks for the session") subscales. Items from the therapist contribution subscale were eliminated to differentiate between therapist techniques and the alliance itself (Frieswyk et al., 1986). For the purpose of this study, the total alliance score was used.

The VTAS-R, rather than the observer form of the WAI (WAI-O; Tichenor & Hill, 1989), was used for several reasons. First, the VTAS was originally designed as an observation-based measure, and therefore, items can be scored on the basis of clients' and therapists' overt behavior and speech. This decreased the need for inference and increased the reliability of item ratings. In contrast, the WAI-O was adapted from the client report form, and a number of items required that the observer use a substantial degree of inference (e.g., "The client feels that the therapist appreciates

him"). This led to difficulties in training raters and, consequently, to lower item reliability. Second, a prior study found that the VTAS and WAI-O were equally correlated with the client form of the WAI, with the VTAS showing greater predictive validity (Fenton et al., 2001).

Adolescent functioning. We assessed adolescent functioning using the Global Appraisal of Individual Needs (GAIN; Dennis, 1999). The GAIN is a standardized clinical assessment battery, covering eight main domains (background, substance use, physical health, risk behaviors, mental health, environment, legal, and vocational), that has been normed on both adults and adolescents (Dennis, Scott, Godley, & Funk, 1999, 2000). For the purposes of this study, we examined two variables extracted from the GAIN: Days of cannabis use and Substance Problem Index (SPI).

Days of cannabis use. Days of cannabis use was based on a single question pertaining to the number of days that the client used marijuana or hashish in the past 90 days, regardless of frequency or amount of use per day. Adolescents' self-report of days of cannabis use showed high test–retest reliability ($\rho = .7$; Dennis, Titus, et al., 2002) and was consistent with family/collateral reports, on-site urine tests, and gas chromatography/mass spectrometry tests for delta-9-tetrahydrocannabinol at intake and various follow-up waves ($\rho = .70–.90$; Buchan, Dennis, Tims, & Diamond, 2002).

The SPI. The SPI comprises 16 questions regarding symptoms of substance abuse and dependence. A total of 7 questions reflect *DSM–IV* criteria for dependence, 4 for abuse, 2 for substance-induced health and psychological problems, as well as 3 lower severity items (i.e., hiding use, people complaining about use, weekly use). The measure reflects the number of various types of problems related to substance use that a client endorses having in the past month, not specific to any single substance. The number of problems reported in the past month had excellent internal consistency ($\alpha = .90$), had excellent test–retest reliability ($r = .73$), and were fairly consistent with family/other collateral reports of adolescents' symptoms ($r = .30$), which tended to be higher (Dennis, Babor, Roebuck, & Donaldson, 2002; Dennis, Titus, et al., 2002). Diagnoses based on the SPI have been shown to have good test–retest reliability ($\kappa = .55$).

Procedure

Adolescents' self-report of alliance. Adolescents completed the WAI at the end of one session sometime between Sessions 2 and 5. In 75% of the cases, the WAI was completed at the end of Session 2; 12% completed the WAI at the end of Session 3, 12% at the end of Session 4, and 1% at the end of Session 5.

Session sampling for observer ratings. For alliance observer rating purposes, we chose the videotape of the same session for which the adolescent completed his or her self-report of the alliance. In those circumstances in which the videotape of the given session was not available, observers rated the next available session. In 79% of the cases, the self-report and observer ratings of the alliance were based on the same session. In another 13% of the cases, observer ratings were for the next immediate session. In the remaining 5% of the cases, observer ratings were collected two sessions after self-report.

Alliance rater training and coding procedure. Rater training was conducted separately for adolescent–therapist and parent–therapist alliances, during twice-weekly, 2-hr training sessions over the course of 6 months. Raters were first given the manual to study and were then presented with dozens of videotaped instances drawn from actual sessions that represented various levels of alliance strength. Training sessions were not drawn from the study sample. Ongoing discussions were conducted to clarify scoring dilemmas. After 6 months of training, raters were given five practice sessions to rate the adolescent–therapist alliance and an additional five practice sessions to rate the parent–therapist alliance. For these practice sessions, raters achieved very good to excellent interrater agreement (interclass correlation coefficient [ICC; 2, 2] > .85) for both alliances, and they were deemed competent to begin coding actual study tapes.

Adolescent–therapist and parent–therapist alliances were coded independently, with two coders rating each alliance for each session. Final alliance scores for each session were calculated by averaging the scores of the two raters. Coders were assigned tapes in rotating, random pairs. However, care was taken so that no rater coded both the adolescent and parent alliances for the same session. Coders were naive to the session number being rated and to the purpose and hypotheses of the study. Weekly recalibration sessions were provided to avoid rater drift.

In 66% of the sessions rated for parent alliance, only one parent was present. In 84% of these instances, it was the mother who was present. In the remaining one third of the cases in which both parents were present, alliance scores were based on the behavior of the more outspoken of the two parents. This was the mother 82% of the time. Analyses showed that there were no differences in the mean parent alliance score for those sessions in which only one parent was present ($M = 3.52$, $SD = 0.66$) versus those sessions that included two parents ($M = 3.73$, $SD = 0.45$), $t(63) = -1.32$, *ns*; furthermore, there were not any differences between mothers' ($M = 3.60$, $SD = 0.63$) versus fathers' ($M = 3.55$, $SD = 0.39$) mean alliance scores, $t(63) = 0.29$, *ns*.

GAIN assessor training and administration. Assessors were trained to use the GAIN interview by its developer and received ongoing supervision by research coordinators, with taped interviews or direct observation, to maximize adherence to the study's research methods. Assessors administered the GAIN prior to the beginning of therapy (i.e., at intake), at posttreatment (i.e., 12-weeks postintake), and at 3-, 6- and 9-month follow-ups. Data analysts regularly reviewed raw data to identify any implementation problems that could be addressed with additional training (Dennis, Titus, et al., 2002).

Results

Preliminary Analyses

Reliability estimates for WAI and VTAS-R. The internal consistency estimates for the full scale alliance scores were high, as indicated by Cronbach's coefficient alpha for the WAI ($\alpha = .94$), and for the VTAS-R ($\alpha = .93$). For observer ratings, the ICC (Shrout & Fleiss, 1979) for adolescent alliance scores was excellent (ICC [2, 2] = .93) and for parent alliance scores was very good (ICC [2, 2] = .88).

Comparison of attriters with treatment completers. From the full sample of 100 families receiving MDFT, 9 cases were excluded from all analyses because there were no alliance data available. Of the remaining 91 cases, 17 terminated treatment prematurely (i.e., completed less than seven sessions). A seven-session completion criterion was used to define treatment completers because it represents more than half the prescribed treatment, and approximates what has been determined a minimum sufficient dose of MDFT by model experts (Robbins et al., in press). Similar criteria have been used in other alliance studies (Brown & O'Leary, 2000).

There were no significant differences between completers and those who terminated treatment prematurely on pretreatment days of cannabis use, ($M = 38.05$, $SD = 29.89$ and $M = 38.73$, $SD = 29.96$, respectively), $t(89) = 1.02$, *ns*; pretreatment substance abuse and dependency symptoms ($M = 3.73$, $SD = 3.19$ and $M = 2.96$, $SD = 3.26$, respectively), $t(89) = 0.29$, *ns*; gender $\chi^2(1, N = 91) = 0.02$, *ns*; ethnicity $\chi^2(1, N = 91) = 1.44$, *ns*; or age ($M = 15.95$, $SD = 1.29$ and $M = 16.19$, $SD = 1.06$, respectively), $t(89) = 0.16$, *ns*. Means and standard deviations for all study variables across the entire sample are presented in Table 1.

Validity of observer-rated versus self-reported adolescent alliance. Before examining the relative contribution of adolescent and parent alliances to treatment outcome, we examined which

measurement perspective of adolescent alliance evidenced greater predictive validity: self-report or observer ratings. Partial correlations between scores from each of the adolescent alliance perspectives (i.e., self-report and observer ratings) and each of the posttreatment and follow-up outcome measures were computed, controlling for the pretreatment level of the corresponding outcome measure. Because we assumed that any actual direct and/or indirect effects of the alliance on outcome could occur only through the process of treatment, only treatment completers were included in this analysis. Of the 74 treatment completers, 61 had both self-report and observer ratings of adolescent alliance available.[1] The correlation between alliance scores from the two perspectives was moderate, $r(61) = .43$, $p < .01$.

The correlations between each alliance perspective and outcome measures are presented in Table 2. The sample size for each analysis varies slightly because of variations in the availability of outcome data at each time point. Results indicate that observer ratings of alliance were significantly correlated with days of cannabis use number of abuse and dependency symptoms at posttreatment, and with number of abuse and dependency symptoms days of cannabis use at 3-months follow-up, whereas self-report of the alliance was not correlated with either of the outcome measures at posttreatment or follow-up.

Ceiling effect. In an effort to explore whether the relatively poorer predictive validity of self-reported alliance was due to adolescents reporting particularly high alliances, thus leading to a ceiling effect, we compared the distributions of self-reported and observer-rated alliance scores. The variances of the two distributions could not be directly compared because we rated them using two different scales, with different ranges. To compare the distributions, we transformed both scales into ordinal scales that comprised 10 equidistant levels, with each level representing 10% of the scale's total range. As hypothesized, self-reported alliance scores were truncated, with 48% of the sample falling within the top 10% of the scale. In contrast, only 8% of observer-rated alliance scores fell within the top 10% of the scale (see Figure 1). Because observer-rated alliance demonstrated greater predictive validity than adolescents' self-report of alliance, only observer ratings of alliance were included in subsequent analyses.

Table 1
Means and Standard Deviations for All Study Variables Across Entire Sample

Variable	M	SD	Sample size
Adolescent alliance: Self-report	70.44	11.50	80
Adolescent alliance: Observer rating	3.44	0.81	80
Parent alliance: Observer rating	3.58	0.66	69
Days of drug use: Pretreatment	38.23	29.76	100
Days of drug use: Posttreatment	28.02	26.52	94
Days of drug use: 3-month follow-up	20.93	25.28	94
Days of drug use: 6-month follow-up	21.08	26.12	88
Days of drug use: 9-month follow-up	23.08	28.58	90
Symptoms: Pretreatment	3.53	3.21	100
Symptoms: Posttreatment	2.83	3.29	94
Symptoms: 3-month follow-up	1.99	2.75	94
Symptoms: 6-month follow-up	2.00	3.06	88
Symptoms: 9-month follow-up	1.80	2.47	88

Table 2
Partial Correlations Between Adolescent Alliance Perspective and Outcome, Controlling for Pretreatment Outcome Measure

Variable	Self-report r	Observer ratings r
Posttreatment ($n = 59$)		
Days of cannabis use	−.18	−.17
No. of symptoms	−.15	−.31**
3-month follow-up ($n = 59$)		
Days of cannabis use	−.21	−.26**
No. of symptoms	−.24	−.04
6-month follow-up ($n = 56$)		
Days of cannabis use	−.06	.09
No. of symptoms	−.05	.06
9-month follow-up ($n = 56$)		
Days of cannabis use	.11	.04
No. of symptoms	−.12	.08

** $p < .05$.

Main Analyses

Alliance and premature termination. To determine whether the adolescent alliance, parent alliance, or both predicted premature termination, we conducted a binary logistic regression analysis. This analysis included those 55 treatment completers and 10 cases that terminated treatment prematurely for whom observer ratings of both adolescent and parent alliances were available. A value of 1′ was designated for treatment completers. Predictors entered into the analysis were adolescent alliance, parent alliance, and the Adolescent × Parent Alliance interaction term. Because 55 of the 65 cases in this sample completed treatment, simply predicting that all cases would complete treatment would lead to an 85% correct prediction rate. Therefore, the inclusion of any given predictor variable, or group of predictor variables, could increase the correct prediction rate by no more than 15%. Nevertheless, our model, which included both alliances and their interaction term, was significant, $\chi^2(3, N = 65) = 12.70$, $p < .01$, and increased the correct prediction rate by 6%, to 91%. Whereas there was no significant effect for adolescent alliance, nor for the Adolescent × Parent Alliance interaction, the Wald statistic of the parent alliance coefficient was significant (6.25, $p < .01$), and the pseudo (Nagelkerke) R^2 was .30. These results indicate that as the parent alliance increased, the family was less likely to terminate treatment prematurely. Furthermore, the association between parent alliance and premature termination was not contingent on (i.e., moderated by) the strength of the adolescent alliance. The adolescent alliance itself was not associated with premature termination.

Alliance and outcome. A primary goal of this study was to examine the association between each alliance and treatment outcome. Again, only treatment completers were included in this analysis on the basis of our assumption that any real effects of alliance on outcome could only occur through the process of treatment. These analyses were conducted on the 55 of the 74 treatment completers for whom observer ratings of both adolescent and parent alliances were available. Means for adolescent and

[1] A series of independent-sample *T* tests revealed no significant between-sample differences on any of the study variables at pretreatment for this or any subsequent analyses.
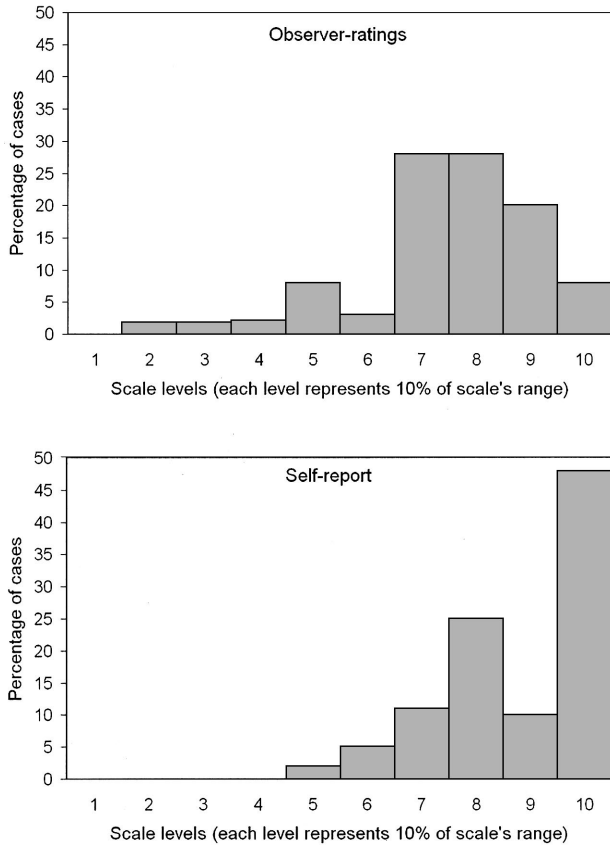
Figure 1. Distribution of percentages for observer-rated and self-reported alliance scores by categories.

parent alliances were 3.47 ($SD = 0.84$) and 3.70 ($SD = 0.40$), respectively. The two alliances were not significantly different in magnitude $t(54) = -1.93$, ns, nor were they significantly correlated, $r(55) = .10$, ns.

We conducted separate multiple regression analyses for each outcome variable (i.e., adolescents' days of cannabis use and frequency of substance abuse and dependency symptoms), at posttreatment, 3-, 6-, and 9-month follow-ups. For each of the regression analyses, the pretreatment level of the corresponding dependent measure was entered as a covariate, and adolescent alliance, parent alliance, and the Adolescent × Parent Alliance interaction term were entered as predictors. To avoid computational multicollinearity caused by high correlations between each predictor and the interaction term, we centered each of the predictor variables (i.e., rescaled by subtracting the sample mean from predictor scores), and we formed the interaction term by multiplying the two centered predictors (for a detailed discussion on centering predictors, see Aiken & West, 1991). Finally, the covariate, the centered components, and the product of the centered components were entered as predictors into the analyses. Squared semipartial correlations were calculated for each of the predictors to determine the unique amount of variance each predictor accounted for in the dependent variable.

Results, appearing in Table 3, indicate that adolescent alliance predicted fewer substance abuse and dependency symptoms at posttreatment, accounting for 7% of the variance. This main effect, however, should be interpreted in the context of a near significant ($p = .06$) Parent × Adolescent Alliance interaction, accounting for 6% of the variance. These findings suggest that the association between adolescent alliance and substance abuse and dependency symptoms is moderated by the strength of the parent alliance. To interpret this interaction, we performed post hoc statistical testing (Aiken & West, 1991). The simple slope regression equation of abuse and dependency symptoms on adolescent alliance was examined as a function of three discrete values of parent alliance (see Figure 2). As suggested by Cohen and Cohen (1983), the three values examined were the mean, mean plus one standard deviation, and mean minus one standard deviation parent alliance scores. Results indicated that adolescent alliance predicted substance abuse and dependency symptoms above and beyond initial symptoms, only when parent alliance was high (i.e., mean plus one

Table 3
Summary of Multiple Regression Analysis for Alliance Predicting Adolescent Self-Report of Cannabis Use and Symptoms

Variable	Days of cannabis use				Substance problem index			
	B	$SE\ B$	β	$(sr)^2$	B	$SE\ B$	β	$(sr)^2$
	Posttreatment[a] ($n = 53$)							
Pretreatment DV	0.41	0.13	.44***	.17	0.37	0.13	.36***	.12
Adolescent alliance	−6.13	4.68	−.18	.03	−1.04	0.51	−.26**	.07
Parent alliance	3.88	9.02	.06	.00	0.57	1.05	.07	.01
Adolescent × Parent Alliance	−0.24	10.95	.00	.00	−2.44	1.25	−.25*	.06
	3-month follow-up[b] ($n = 53$)							
Pretreatment DV	0.42	0.12	.45***	.19	0.38	0.11	.47***	.20
Adolescent alliance	−12.60	4.12	−.39***	.14	−0.40	0.39	−.13	.02
Parent alliance	8.80	8.42	.13	.02	−0.40	0.86	−.06	.00
Adolescent × Parent Alliance	16.32	9.88	.20	.04	0.81	0.98	.11	.01

Note. DV = pretreatment levels of the dependent variable being analyzed in the regression model.
[a] $R^2 = .18$, $p < .05$, for days of cannabis use; $R^2 = .25$, $p < .01$, for substance problem index.   [b] $R^2 = .31$, $p < .01$, for days of cannabis use; $R^2 = .24$, $p < .01$, for substance problem index.
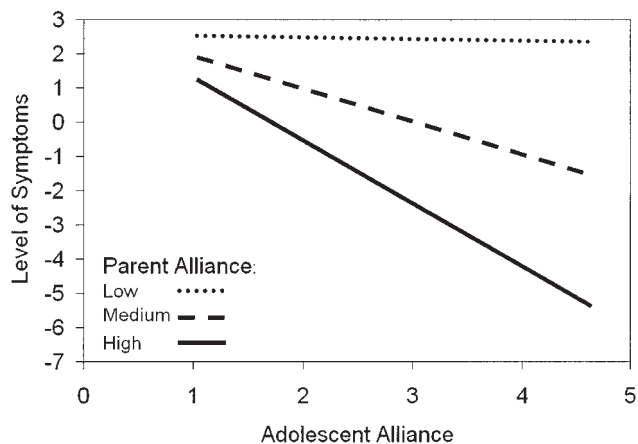* $p = .06$.   ** $p < .05$.   *** $p < .01$.

Figure 2. Regression lines for low, medium, and high levels of therapist–parent alliance. The *y*-axis reflects levels of substance abuse and dependency symptoms at posttreatment, after controlling for pretreatment level of symptoms.

standard deviation), $b = -2.02$, $p < .01$, and moderate (i.e., mean) $b = -1.04$, $p < .05$, but not when it was low (i.e., mean minus one standard deviation) $b = -0.07$, *ns*.

Adolescent alliance also predicted adolescents' self-report of days of cannabis use at 3-month follow-up, above and beyond pretreatment days of use and regardless of the strength of the parent alliance, accounting for 14% of the variance.[2] There was no significant association between adolescent alliance and substance abuse and dependency symptoms at this time point. At 6- and 9-month follow-ups, neither alliance score, their interaction, nor pretreatment levels of the dependent variables, predicted days of cannabis use (whole model R^2s were .17, *ns*; and .07, *ns*; respectively) nor abuse and dependency symptoms (whole model R^2s were .07, *ns*; and .05, *ns*; respectively).

Discussion

A vast amount of research attests to the predictive validity of the alliance in therapy with adults. This study was among the first to examine the unique and interactive roles of the adolescent-therapist and parent-therapist alliances in the outcome of family based therapy. Results suggest that each alliance made a unique and important contribution to treatment outcome, as measured during the three months subsequent to the active phase of treatment. More specifically, among treatment completers, the strength of the early adolescent alliance predicted adolescents' substance abuse and dependency symptoms at posttreatment, with the main effect accounting for 7% of the variance and the Adolescent × Parent Alliance interaction accounting for an additional 6% of the variance. Furthermore, early adolescent alliance predicted adolescents' days of cannabis use during the 90 days immediately subsequent to the end of treatment, accounting for 14% of the variance. Such effects are considered moderate in magnitude (Cohen, 1988) and are substantially higher than the average effects found in the adult literature (Horvath, 2000; Martin et al., 2000). They suggest that, whereas the strength of the parent alliance predicts whether or not the family remains in treatment, once the family engages in treatment, it may be the

quality of the alliance with the adolescent which, at least in part, determines changes in the adolescent's drug-using behavior.

Not only was there a main effect of adolescent alliance on treatment outcome, but this association was, in part, moderated by the quality of the parent alliance. More specifically, the strength of the adolescent alliance predicted adolescent's abuse and dependency symptoms only when the parent alliance was of moderate or high strength. One explanation may be that in cases in which the parent and therapist also agreed on the goals and tasks of therapy, parents were more likely to become engaged with their adolescent, both emotionally and in terms of the adolescent's day-to-day functioning—processes that have been associated with improved outcome in MDFT (Schmidt, Liddle, & Dakof, 1996). Such change on the parents' part may have facilitated the effect of a good adolescent alliance. In contrast, in cases with poor parent alliances, parents may have been less likely to change their behavior in the desired fashion, potentially attenuating the effect of a good adolescent alliance. This finding highlights the interactive, systemic nature of the change process in family based treatments.

One goal of this study was to identify the more valid procedure for measuring adolescent alliance. We found a modest correlation between observer ratings and adolescents' self-report of the alliance. This suggests that the two perspectives captured both shared and unique processes. Observer-rated alliance, however, was a stronger and more robust predictor of treatment outcome than adolescents' self-report of the alliance. Observer-rated alliance predicted adolescents' substance abuse and dependency symptoms at posttreatment, and days of cannabis use at 3-months follow-up, whereas self-report did not predict either outcome variable at any time point. These findings are similar to those of Fenton et al. (2001), who found that in a sample of adults exhibiting substance abuse, observer-rated alliance predicted outcome, whereas client self-report did not.

One reason why independent observer ratings of alliance predicted treatment outcome better than adolescents' self-report may be that adolescents inflated their report of the alliance, resulting in a ceiling effect. Fenton et al. (2001) suggested that adults who abuse substances report an overly positive alliance out of a fear of expressing negative feelings about the therapist. This may be even more true for adolescents abusing substances, whose treatment progress, as evaluated by the therapist, is typically being monitored by parents, juvenile justice, and the school alike. Results of this study show that, as a group, adolescents did indeed report higher alliance scores than those reported by independent observers.

Although many of the study's hypotheses received support, neither alliance predicted either of the outcome measures at 6- or 9-month follow-ups. There is no ready explanation for these findings. They are not due to fluctuations in adolescents' drug use over time, because the average treatment gains evident at the end of 3 months of therapy remained relatively constant throughout the 9 months of follow-up (Dennis et al., 2004). It may be that for some adolescents, although their strong alliance and ongoing contact with the therapist during the active phase of treatment helped them

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[2] Similar results were found when we used parents' report of adolescents' days of cannabis use.

to manage their drug use, it did not lead to the type of intrapersonal and interpersonal changes necessary to sustain such gains.

A number of methodological strengths increase our confidence in the findings reported. First, we independently rated the two alliances using a valid observer-based measure and highly reliable raters. Observer-based alliance ratings eliminated the threat that alliance-outcome correlations were due to reporter bias. Second, we gathered outcome data using a well validated measure and highly trained and supervised assessors. Third, the sample size for this study was substantial, particularly in relation to other longitudinal treatment process-outcome studies.

Nevertheless, certain aspects of the study limit our interpretation of the results. Two aspects of the methodology limit the generalizability of the findings. First, only three highly trained and expertly supervised therapists delivered MDFT in this study. Second, analyses examining the associations between the two alliances and adolescents' drug-using behaviors and symptoms included only 55 of the 91 available cases, or 60% of the entire sample. The remaining cases either terminated prematurely or did not have a complete set of alliance or outcome data. However, because premature termination was found to be associated with poorer parent alliances, and because highly trained therapists are more likely to form stronger alliances than less trained or supervised therapists, our selection criteria may have actually reduced the variation in both the independent and dependent measures and, consequently, the correlations between them. Paradoxically, findings in less restricted samples may reveal correlations of greater magnitude. A third limitation was that the design of the study did not allow us to examine the process by which the adolescent alliance had an impact on outcome. Most likely, alliance exerts both a direct and mediating effect on treatment outcome. In other words, the relationship with the therapist is likely both curative in and of itself, and facilitates family members' productive participation in the specific tasks of treatment, such as improved problem solving behavior or increased affiliation with prosocial contexts, which in turn improve outcome. Future research is required to independently examine these two pathways to change.

Even within the constraints mentioned above, this study provides some of the first evidence of how each alliance uniquely, and in interaction with one another, contributes to the success of family based treatment with adolescents who abuse substances. Results suggest that, whereas the strength of the parent-therapist alliance appears to influence treatment completion, the strength of the alliance with the adolescent appears to impact on treatment outcome. Such findings underscore the importance of developing and disseminating specific and well-defined strategies for the formation and maintenance of each of these alliances (G. M. Diamond et al., 1999; Liddle, 1995, 2002b; Liddle & Diamond, 1991; Szapocznik et al., 1988), and of researching the effect of such alliance-building strategies.

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