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Behavioral Couples Treatment for Substance Use Disorder: Secondary Effects on the Reduction of Youth Internalizing Symptoms

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Abstract

This study examined the secondary effects of Behavioral Couples Treatment (BCT) for parents with substance use disorder on youth reports of internalizing symptoms (i.e., depressive and anxiety symptoms). Participants were 59 triads (father, mothers, and youth; 32 girls, 27 boys) in which one or both parents met criteria for drug or alcohol use disorder (or both). Mothers, fathers, and youth completed pretreatment, post-intervention, and 6-month post-intervention follow-up assessments. Two piecewise latent growth models examined whether number of sessions attended was associated with parents' relationship satisfaction or its growth over time, and in turn if parents' relationship satisfaction was uniquely associated with youth depressive/anxiety symptoms or their growth over time. A significant indirect effect at post-intervention revealed the number of sessions attended contributed to decreases in youth depressive symptoms via increases in mothers' and fathers' relationship satisfaction. Mothers' relationship satisfaction uniquely mediated the relationship between number of sessions attended and youth depressive symptoms at post-intervention. With regards to fathers, there was a non-significant trend such that increases in sessions attended was associated with decreases in youth depressive symptoms post-intervention via increasing relationship satisfaction among fathers. Findings suggest that BCT may have protective secondary effects in reducing youth reports of depressive symptoms among couples in which one or both parents have substance use disorder.

Keywords

substance abuse treatment; relationship satisfaction; youth depressive symptoms

Relative to children of non-substance-abusing parents, children of substance abusers (COSAs) have greater risk for internalizing disorders, such as depression and anxiety

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Compliance with Ethical Standards:

The study was approved by the institutional review board at the participating institution. Parents gave written consent for themselves and their children; youth gave verbal assent. All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflicts of Interest The authors declare that they have no conflict of interest.

(Bountress & Chassin, 2015; Hussong, Flora, Curran, Chassin, & Zucker, 2008; VanDeMark et al., 2005; Wilens et al., 2002). Behavioral Couples Therapy (BCT), a conjoint treatment designed to reduce substance use and improve relationship functioning (O'Farrell & Fals-Stewart, 2006), has demonstrated benefits in reducing alcohol use (see Klostermann, Kelley, Mignone, Pusateri, & Wills, 2011 and O'Farrell & Clements, 2012 for reviews) and improving relationship adjustment (Drapkin, McCrady, Swingle, & Epstein, 2005). However, whether BCT has secondary benefits for youth in their homes has received limited attention. The present study examined whether number of BCT sessions attended and changes in mothers' and fathers' relationship satisfaction were associated with youth reports of depressive and anxiety symptoms among couples in which one or both parents were diagnosed with substance use disorder.

By late childhood many COSAs have diagnosable psychological disorders (e.g., Luthar, Cushing, Merikangas, & Rounsaville, 1998). In fact, Wilens et al. (2002) found 59% of youth of opioid-dependent parents, 41% of the children of parents with alcohol use disorder, and 28% of the control group were diagnosed by a board-certified psychiatrist or psychologist with one or more childhood disorders. Although treating these youth directly may be ideal, children's involvement in mental health care rests on the willingness of parents to allow their children to take part in these services. Parents' concerns of child protection services involvement (Lester, Andreozzi, & Appiah, 2004), family discord (Smith, Linnemeyer, Scalise, & Hamilton, 2013), and finances, transportation, and other obstacles (Serec et al., 2012) may disproportionately diminish the willingness of parents with substance use disorder to allow their children to receive mental health care. For instance, a recent study found 59% of mothers and 72% of fathers entering treatment for drug or alcohol abuse were unwilling to allow their children to receive individual or family mental health treatment (Kelley, D'Lima, Henson, & Cotton, 2014). Thus, treatments that do not directly involve children, but serve to address a potential cause of youth symptoms and improve the family environment as a whole, may have promise for improving the psychosocial adjustment of youth in these homes.

BCT is a conjoint treatment for substance abuse that works to facilitate positive communication, promote dyadic functioning, and reduce partner conflict. BCT is based on the assumption that reducing dyadic distress may help build relationships and facilitate abstinence (McCrady, Epstein, Cook, Jensen, & Hildebrandt, 2009; Schumm & O'Farrell, 2013). This focus is especially important as interparental conflict and marital dissatisfaction are frequent concerns in families in which one or both parents have substance use disorder (Homish, Leonard, & Cornelius, 2008; Kelley et al., 2010; Stover, Easton, & McMahon, 2013) and marital conflict predicts youth internalizing problems (Katz & Gottman, 1993). However, research on the outcomes of couples therapies rarely examine whether youth functioning improves as a function of their parents' therapy. In fact, a meta-analysis found more than 20% of clinical trials of couples therapy did not even report whether couples had children (Vu & Christensen, 2003).

According to a family systems perspective (Minuchin, 1985), family members are involved in multiple family subsystems. Key to youth functioning, however, appears to be the interparental relationship which is believed to set the tone for family functioning (Davies &

Cicchetti, 2004). Poor relationship satisfaction and dyadic conflict may impact family subsystems and individual family members (Bonds & Gondoli, 2007). More specifically, the Emotional Security Hypothesis (EST; Cummings & Davies, 2010) posits that children's adjustment is influenced by feelings of safety in the family environment. In line with EST, family discord and conflict may undermine the child's sense of security and contribute to the development of child and adolescent internalizing problems (Emery, 1999; Kane & Garber, 2004; Katz & Gottman, 1993). Family systems are fluid, however, and declines in marital adjustment have been linked to increases in children's internalizing symptoms over time (e.g., Brock & Kochanska, 2015). In one of the few studies that examined the secondary effects of individual substance abuse treatment for alcoholic fathers on their children, treatment was associated with parents' reports of improvements in youth emotional and behavioral functioning (Andreas & O'Farrell, 2007). Thus, in the present study, we test whether changes in relationship satisfaction may serve as a mechanism by which BCT results in reductions in youth depressive and anxiety symptoms.

Purpose

The purpose of the present study was to extend research on the secondary effects of treatment for substance-abusing parents by examining whether number of BCT sessions attended and changes in relationship functioning were associated with youth internalizing symptoms as reported by youth themselves. Thus, we tested two parallel process models in which number of sessions attended was expected to increase both fathers' and mothers' reports of relationship satisfaction, which in turn were expected to decrease youth reports of depressive and anxiety symptoms. That is, the number of BCT sessions attended was expected to have negative indirect effects on youth depressive and anxiety symptoms (i.e., reduced youth depressive and anxiety symptoms scores) via its impact on each parent's relationship functioning (i.e., improved satisfaction reports).

Method

Participants and Procedure

The present research is a secondary analysis of data from a larger study in which eligible couples could receive BCT for substance abuse (Author et al., 2015). To be eligible for the study, (1) one or both partners had to meet drug or alcohol abuse or dependence criteria based on the Structured Clinical Interview for DSM-IV-TR Axis I disorders (SCID; First, Spitzer, Gibbon, & Williams, 2010), (2) there was no history of severe partner violence as concluded from items that assess injury on the CTS-2 (Straus, Hamby, Boney-McCoy, & Sugarman, 1996), (3) family members had to speak fluent English, and (4) parents had to reside with the target child (i.e., for families with more than one child between 6 and 18, the target child was the child with the closest birthdate to the initial screening). Demographic information is summarized in Table 1.

After completing the pretreatment assessment ($n = 106$), couples were invited to attend 12 BCT sessions. Only data from parents and youth ($n = 59$) that completed at least two of three possible assessments: pretreatment, a post-intervention follow-up (3 months after the initial pretreatment assessment), and 6-month post-intervention follow-up are examined. For

couples who discontinued therapy, the follow-up assessments (for both parents and youth) were conducted at a comparable time to those who completed all treatment sessions. Mothers, fathers, and youth were compensated \$30 each at pretreatment, then \$50 each for each of the follow-ups. The study was approved by the institutional review board at the participating institution. Parents gave written consent for themselves and their children; youth gave verbal assent.

Materials

Participants were diagnosed with drug, alcohol, or both disorders using the SCID (First, et al., 2010) which has shown moderate to excellent inter-rater agreement for Axis I disorders (Lobbestael, Leurgans, & Arntz, 2010). Participants were administered the SCID only at pretreatment; all other questionnaires were completed at each assessment. At the follow-up assessments, questions pertained to the previous 3-month period.

Behavioral Couples Therapy—The 12 weekly conjoint BCT sessions were designed (1) to help partners refrain from drug and alcohol use via reviewing and reinforcing a verbal contract (i.e., Recovery Contract), (2) to teach successful communication skills including active listening and expressing feelings clearly and directly; and (3) to instruct couples in acknowledging positive qualities and behaviors in one another and encourage couples to share in leisure activities. All counselors followed a detailed treatment manual (O’Farrell & Fals-Stewart, 2006) with weekly modules that included in-session exercises and weekly homework. Counselors were able to address clinical issues as necessary. Sessions did not address parenting skills, parent-child interactions, or child behavior. The mean number of BCT sessions attended was 6.78 ($SD = 4.95$; Range = 0 to 12). Number of sessions attended is treated as an indicator of treatment dosage. See Author (2016) for additional information regarding treatment providers (i.e., counselors) and training procedures.

Relationship satisfaction—The Dyadic Adjustment Scale (DAS; Spanier, 1976) was used to assess relationship satisfaction. The DAS is a widely-used research and clinical measure that assesses dyadic consensus, dyadic satisfaction, affectional expression, and dyadic cohesion. Response scales vary for individual items; item scores are summed to create a total score in which higher values indicate better levels of relationship satisfaction (maximum possible value of 151). Reliability for the current study was excellent for both fathers ($\alpha = .95, .85, .95$ for times 1, 2, and 3 respectively) and mothers ($\alpha = .95, .98, .98$ for times 1, 2, and 3 respectively).

Youth depressive symptoms—Youth completed the 10-item short version of the Child Depression Inventory (CDI; Kovacs, 1992). The CDI is a widely used self-report instrument with good reliability and demonstrated construct validity (Kovacs, 1992) that assesses the extent and severity of depressive symptoms within the last 2 weeks. Youth are presented with three response choices per item which correspond to three levels of symptomatology (i.e., 0 = *absence of symptom*, 1 = *mild or probably symptom*, 2 = *definite symptom*). Item scores are summed to create a total score; higher values indicate more depressive symptoms. Reliability for the current study was acceptable to good ($\alpha = .61, .81, .80$ for times 1, 2, and 3, respectively).

Youth anxiety symptoms—Youth completed the 37-item Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978). The RCMAS is a widely used self-report instrument that assesses anxiety symptoms in youth with good reliability and demonstrated construct validity (Varela & Biggs, 2006). Each item is scored dichotomously (0 = *no*, 1 = *yes*) to reflect whether the child feels that statement is true about themselves (e.g., "I worry a lot of the time"). Item scores are summed to create a total score; higher values indicate more anxiety symptoms. Reliability for the current study was good ($\alpha = .88, .90$, and $.91$ for times 1, 2, and 3, respectively).

Statistical Analyses

Before analyses were conducted, data were cleaned and statistical assumptions were addressed. Two multi-slope parallel process models were conducted assessing if number of sessions attended were associated with father and mother reports of relationship satisfaction (intercept) or its growth over time (slopes 1 and 2), and in turn if parents' relationship satisfaction was associated with youth depressive and anxiety symptoms (intercept) or their growth over time (slopes 1 and 2). Piecewise latent growth models captured growth from pre-treatment to post-treatment (treatment effect; slope 1) as well as growth from post-treatment to the 6-month follow-up (maintenance; slope 2). Mothers' and fathers' relationship satisfaction were estimated simultaneously in the same models. Relationship satisfaction growth for both mothers and fathers predicted youth depressive and anxiety symptoms for the same period (e.g., relationship satisfaction slope 1's association with depressive symptoms slope 1). The piecewise latent growth models were conducted in Mplus, version 7.2 (Muthén & Muthén, 1998–2012).

We examined the total, direct, and indirect effects of each predictor variable on outcomes using bias-corrected bootstrapped estimates (Efron & Tibshirani, 1993) based on 10,000 bootstrapped samples, which provides a powerful test of mediation (Fritz & MacKinnon, 2007) and is robust to small departures from normality (Erceg-Hurn & Mirosevich, 2008). Consistent with modern approaches, indirect effects were investigated despite the relatively weak correlations observed between number of sessions attended and outcome variables as seen in Table 2 (e.g., Hayes, 2009; Zhao et al., 2010). Mediation may be present even when total effects are not observed. Parameters were estimated using maximum likelihood estimation, and missing data were handled using full information maximum likelihood, which is more efficient and has less bias than many alternative procedures (Enders, 2001; Enders & Bandalos, 2001). Statistical significance was concluded if 95% bootstrap confidence intervals (CIs) did not contain zero, corresponding with $p < .05$. Furthermore, given that small- n substance abuse treatment studies are usually underpowered to detect statistically significant (i.e., $p < .05$) effects (Ashery & McAuliffe, 1992); we also discussed all non-significant trends (i.e., determined by 90% CIs, corresponding with $p < .10$) so as not to miss clinically relevant effects, and present both 95% and 90% bootstrap CIs in Tables 3 and 4. Among both outcomes (i.e., depressive and anxiety symptoms) similar models were conducted including child sex, marital status, and length of cohabitation between mothers and fathers as covariates. However, results were consistent across models, covariates were not significantly associated with longitudinal outcomes after controlling for the other

predictors, and model fit worsened. For simplicity, only the models without these covariates are presented.

Results

Descriptive statistics and bivariate correlations among all observed variables within the parallel-process latent growth models are shown in Table 2. Specific indirect and direct effects for the piecewise latent growth models are summarized in Table 3 (depressive symptoms) and Table 4 (anxiety symptoms). The values represented in the top section of Tables 3 and 4 represent the intercepts for the latent growth of relationship satisfaction, which are interpreted as growth observed if the values of the associated predictors are zero (in this case, meaning no treatment sessions were attended). As seen in Tables 3 and 4, relationship satisfaction growth from pre-treatment to post-intervention, and from pre-treatment to 6 months after post-intervention, are not significant for either mothers or fathers. Thus, if couples do not attend treatment, there are no significant changes in relationship satisfaction across time. Similarly (though not shown in Tables 3 and 4 for clarity), both youth depressive and anxiety symptoms' growth to post-intervention and 6-month post-intervention follow-up are not statistically significant, indicating that if no treatment sessions are attended and relationship satisfaction does not change for both mothers and fathers, youth internalizing symptoms do not significantly change over time. However, there was a non-significant trend at the 6-month post-intervention follow-up for depressive symptoms only, indicating that even after non-significant decreases to post-intervention ($\beta = -.12$), youth depressive symptoms continued decreasing over time, $\beta = -.48$, 90% CI $[-2.78, -0.06]$.

Youth depressive symptoms

Among mothers at post-intervention (i.e., slope 1), increases in number of sessions attended significantly predicted increases in relationship satisfaction ($\beta = .40$). Further, increases in relationship satisfaction among mothers uniquely (i.e., controlling for fathers' relationship satisfaction) predicted decreases in youth depressive symptoms at post-intervention ($\beta = -.23$). As could be expected by these direct effects (see Figure 1), mothers' relationship satisfaction uniquely mediated the relationship between number of sessions attended and youth depressive symptoms post-intervention (indirect $\beta = -.09$). This result indicates a significant intervention effect such that increases in sessions attended significantly impacts (i.e., decreases) youth depressive symptoms post-intervention via increasing relationship satisfaction among mothers (see Table 3). The indirect effect from post-intervention through the 6-month follow-up assessment (i.e., slope 2) was non-significant. With regards to fathers, there were no statistically significant indirect effects at any time point. However, there was a non-significant trend such that increases in sessions attended significantly impacts (i.e., decreases) youth depressive symptoms post-intervention via increasing relationship satisfaction among fathers, indirect $\beta = -.05$, 90% CI $[-0.09, -0.03]$.

To further probe these findings and the explanations behind them, we ran two additional multi-slope parallel process models examining parenting and days abstinent from drugs or alcohol as mediators between number of treatment sessions attended and youth depression.

These models were identical to the main models for the current study, but with different mediators. Overall, there was no significant indirect effect for either of these models, largely due to the lack of association between number of sessions attended and the growth of potential mediators (i.e., parenting and days abstinent from drugs or alcohol). However, there were some significant direct effects influencing child depression (e.g., decreases in poor parenting among fathers was associated with decreases in depression among children at post-treatment). Details are available upon request.

Youth anxiety symptoms

There were no significant indirect effects (or non-significant trends) found between numbers of sessions and youth reports of anxiety symptoms through parental relationship satisfaction (see Table 4). There was only one significant direct effect for mothers, with a significant positive association between number of sessions attended and relationship satisfaction growth to post-treatment, with more sessions attended relating to more satisfaction. There were no significant direct effects for fathers, and no non-significant trends for either parent.

Discussion

Although couples- and family-involved approaches to substance abuse treatment have been shown to reduce substance use and improve relationship satisfaction (e.g., see O'Farrell & Clements, 2012; Schumm & O'Farrell, 2013), the potential secondary effects of BCT on youth in their homes has received limited research. Based on family systems theory, the present study tested two piecewise latent growth models to examine whether BCT delivered to parents with drug and alcohol use disorders had secondary effects on depressive and anxiety symptoms among youth in their homes. Our results provide preliminary evidence that a secondary benefit of parents' attending more BCT treatment sessions is the reduction of youth depressive symptoms, but not anxiety symptoms.

More precisely, more sessions attended was associated with significant decreases in youth depressive symptoms at post-intervention via increasing relationship satisfaction among both mothers and fathers. However, only mothers' relationship satisfaction uniquely (i.e., controlling for fathers' relationship satisfaction) mediated the relationship between number of sessions attended and youth depressive symptoms at post-intervention, with a weaker non-significant trend evidencing for fathers' relationship satisfaction.

There are a number of reasons why the mediating effect of mothers' relationship satisfaction may have been stronger ($\beta = -0.09$) than fathers' relationship satisfaction ($\beta = -0.05$) for the association between number of sessions attended and youth depressive symptoms. Gendered beliefs about mothers' and fathers' roles continue to prescribe that mothers take greater responsibility for childrearing (Gaunt & Scott, 2014). Mothers may have been the primary caregivers in these families since fathers typically were the only parent that met criteria for SUD. Also, even when mothers with SUD reside with other adults, they are still likely to be their children's primary caregiver (Kearney, Murphy, & Rosenbaum, 1994). Further, among men and women in treatment for dual diagnosis, DiNitto, Webb, and Rubin (2002) found that women reported having closer relationships to and spending more time with their children and family than did men. Thus, it is possible that mothers may have a

more central role in their children's lives, and changes in mothers' relationship satisfaction may have resulted in greater changes in the family environment. Clearly additional research is needed with more complex models and larger samples to tease out the various mechanisms that may be play. However, our focus was on relationship satisfaction as this is the focus of BCT.

The stronger association between mothers' relationship satisfaction and youth depressive symptoms may also reflect that non-substance abusing women had lower pretreatment relationship satisfaction. Thus, changes in mothers' relationship satisfaction may have been more salient and children may have had more opportunity to notice changes in their mothers' relationship satisfaction. Further, working to increase partners', and particularly women's relationship satisfaction, may have small but important implications for depression among youth in these homes.

Importantly, the number of sessions attended was only significantly associated with mothers' relationship satisfaction. Mothers were nearly always the parent that initiated treatment. This finding may reflect that typically mothers were the non-substance-abusing parent. It is possible that mothers may have been frustrated by their partners' substance use and its impact on the family. If this is the case, mothers' relationship satisfaction may have had a stronger influence on whether to continue attending therapy. Thus, changes in mothers' relationship satisfaction may be more closely tied to the therapy process.

Relationship satisfaction declined from post-intervention to 6-month follow-up; however, the decline in youth reports of depressive symptoms was maintained from post-treatment to 6-month follow-up. BCT works to increase partner support for abstinence by facilitating positive communication (e.g., complementing one another daily), helping partners identify and reengage in mutually enjoyable activities, and developing skills to reduce conflict. Youth may witness more positive interactions and less conflict even as satisfaction declines. Also, the skills developed in BCT may spill over into the parent-child relationship. These changes may reduce youth depressive symptoms. Of note, reductions in youth depression that were associated with increases in relationship satisfaction cannot be explained by reductions in substance use or improvements in parenting.

In contrast to the findings for youth depression, there were no significant indirect effects (or non-significant trends) found between numbers of sessions and youth reports of anxiety symptoms through parental relationship satisfaction. EST (e.g., Cummings & Davies, 2010) posits that youth internalizing symptoms are influenced by their perception of threat which stems from interparental conflict and intimate partner violence. The lack of findings with respect to youth anxiety may reflect that we focused on relationship satisfaction rather than interparental conflict or perception of threat. Further research should more directly assess interparental violence and youth perceptions of threat.

Clinical Implications and Future Directions

Treatment for adults with SUD typically involves individual treatment or group therapy. Although individual (Carroll & Onken, 2005) and group therapy (Kownacki & Shadish, 1999) can be effective for users themselves, these approaches do not include partners or

children directly. A loved one's drug or alcohol abuse often has effects on all family members. For instance, poor relationship satisfaction and interparental conflict are frequent concerns in families in which one or both parents have SUD (Homish et al., 2008; Kelley et al., 2010; Stover et al., 2013) and COSAs are prone to depression (e.g., Bountress & Chassin, 2015). Although directly involving COSAs in treatment may be ideal, many parents with SUD will not allow their children to receive any form of mental health treatment (Kelley et al., 2014). For these reasons, treatments, such as BCT, that do not involve children directly but work to address aspects of parent functioning such as communication and conflict, may have considerable potential to change the family climate and to positively influence children's adjustment.

Despite the effectiveness of BCT (see Klostermann et al., 2011 and O'Farrell & Clements, 2012 for reviews), there are several important directions for future research. For instance, we do not know whether BCT has long-term benefits for children's emotional and behavioral functioning. Further, the effectiveness of BCT has typically been examined among couples in which one partner has alcohol use disorder and among heterosexual couples. The efficacy of BCT for drug use, among couples in which both partners have drug or alcohol use disorders, among sexual minority couples, and as an add-on to other forms of treatment has received far less empirical attention and are directions for future research.

Limitations

Several limitations should be noted. Foremost, specific skills gained from attending BCT sessions were not assessed, thus, we are unable to determine the extent to which specific skills actually influenced relationship satisfaction and in turn child depressive symptoms. Also, this was a trial of BCT over time, there was no randomized control group, thus, limiting the ability to infer causality. Similar to the results of other substance abuse treatment studies (e.g., Epstein et al., 2007; Kelly, Epstein, & McCrady, 2004) drop-out was high, with the typical couple completing approximately seven of 12 BCT sessions. Further, the generalizability of the findings may be limited to couples with substance use disorder who are willing to take part in a couples-based substance abuse treatment. Also, we did not collect data on whether youth were in therapy. Also, reliability for the CDI was low at pretreatment.

In addition, the small sample size prohibited multi-group analysis to examine whether the associations between the number of sessions attended, parents' relationship satisfaction, and youth depressive symptoms differed based on type of substance use disorder, dual vs. single users, abuse vs. dependence, and children's developmental stage. Finally, the small sample size also yielded low power for detecting clinically relevant effects, which is why beta values were reported as indicators of effect size, and effects that approached significance were still discussed. The low power may have also contributed to the non-significant findings for maintenance (i.e., no significant growth or decay) after post-treatment. Future research should attempt to replicate these findings with larger samples and to test more complex models. For example, future studies could examine other children outcome measures (e.g., aggressive behavior, school adjustment) as well as other family (e.g., conflict between parents) and parental adjustment (e.g., depression) variables that might mediate the links

between BCT attendance and youth adjustment. Further, the present study was not a randomized control trial (RCT), thus future studies are needed with a more stringent methodological design (i.e., RCT) to examine the secondary effects of BCT treatment on youth functioning.

Conclusion

Findings contribute to the literature on how couples-based treatment for substance use disorder, and more globally, parental treatment for substance use disorder may impact youth who reside in these homes. Youth whose parents attended more sessions reported fewer depressive symptoms from pretreatment to post-treatment. Importantly, the decline in youth depressive symptoms was maintained from posttreatment to 6-month posttreatment follow-up. For both mothers and fathers, attending more BCT sessions was associated with increases in relationship satisfaction which reduced youth reports of depressive symptoms; however, changes in mothers' relationship satisfaction appear more strongly linked to youth depressive symptoms.

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Figure 1.

Standardized results of the parallel-process latent growth model (LGM) for number of sessions, Mother DAS and CDI ($N = 59$). Significant effects are in bold typeface for emphasis and were determined by a 95% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain 0. Non-significant trends (using a 90% bias-corrected bootstrapped confidence interval) are in italic typeface. Factor loadings were set to 1 for the intercept to reflect pretreatment levels for each construct. Factor loadings were set to 0, 1, and 1 for pretreatment, post-intervention, and 6-month post-intervention follow-up, respectively, for slope 1 to capture growth from baseline to post-intervention (the intervention effect), and were set to 0, 0, and 1 for slope 2 to capture growth from post-intervention to 6-month follow-up (the maintenance effect). Loadings constrained to 0 for the intercept and slope factors, father DAS, correlations among errors, and disturbances are not displayed for clarity. DAS = Dyadic Adjustment Scale, CDI = Child Depression Inventory.

Table 1

Demographic information for female and male partners

Variable	Mother			Father		
	Count (%)	M	SD	Count (%)	M	SD
Age in years	-	41.63	7.57	-	43.73	7.95
Ethnicity						
African-American	11 (18.64)	-	-	16 (26.23)	-	-
	1 (1.70)	-	-	2 (3.28)	-	-
Asian	1 (1.70)	-	-	0 (0.0)	-	-
Caucasian	35 (59.32)	-	-	35 (59.32)	-	-
Hispanic or Latino	1 (1.70)	-	-	3 (4.92)	-	-
Multicultural/Other	10 (16.95)	-	-	3 (4.92)	-	-
Married						
Yes	26 (44.10)	-	-	26 (44.10)	-	-
No	33 (55.90)	-	-	33 (55.90)	-	-
Years cohabitating	-	8.51	7.10	-	9.00	7.54
Years of education	-	13.68	2.44	-	13.08	2.30
Income (past 6 months)						
< \$20,000	37 (62.71)	-	-	27 (45.76)	-	-
\$20,000 to < \$40,000	13 (22.03)	-	-	13 (22.03)	-	-
\$40,000 to < \$60,000	5 (8.48)	-	-	11 (18.64)	-	-
> \$60,000	2 (3.39)	-	-	8 (13.56)	-	-
Missing	2 (3.39)	-	-	0 (0.00)	-	-
Substance use disorder diagnosis						
None	30 (50.85)	-	-	5 (8.48)	-	-
Alcohol only	6 (10.17)	-	-	15 (25.42)	-	-
Drug only	7 (11.86)	-	-	8 (13.56)	-	-
Alcohol and drug	16 (27.12)	-	-	31 (47.54)	-	-
Child age in years	-	11.20	3.68	-	11.22	3.67
Child sex						
Male	27 (45.80)	-	-	27 (45.80)	-	-
Female	32 (54.20)	-	-	32 (54.20)	-	-

Note. Independent samples t-test were conducted examining gender differences on age, income, and SUD diagnoses. Based on significant results ($p < .05$), men reported a higher income and were more likely to be diagnosed as alcohol, drug, and dual users compared to women.

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Table 2
Descriptive statistics and correlations among all observed variables within the parallel-process latent growth model

	1	2	3	4	5	6	7	8	9	10	11	12	M	SD
1. Number of Sessions	---												6.78	4.95
2. F: DAS_1	-.14												98.56	24.99
3. F: DAS_2	.11	.64											104.63	23.38
4. F: DAS_3	.16	.42	.66										97.13	31.67
5. M: DAS_1	-.05	.65	.41	.40									88.94	26.56
6. M: DAS_2	.32	.33	.56	.34	.42								93.66	32.08
7. M: DAS_3	.23	.60	.61	.59	.62	.61							86.97	35.41
8. C: CDI_1	.10	.22	.04	-.00	-.02	-.00	-.02						2.41	2.23
9. C: CDI_2	.10	-.07	-.34	-.31	-.15	-.26	-.31	.49					2.41	2.98
10. C: CDI_3	.07	-.39	-.36	-.34	-.34	-.37	-.37	.41	.56				1.69	2.17
11. C: RCMAS_1	-.06	.17	-.05	-.15	.18	-.11	-.13	.69	.45	.26			9.63	6.24
12. C: RCMAS_2	-.05	-.15	-.35	-.31	-.16	-.29	-.29	.50	.71	.46	.63		9.91	6.90
13. C: RCMAS_2	-.08	.02	-.25	-.37	.06	-.24	-.22	.38	.60	.56	.68	.77	7.66	6.51

Note. F = Father, M = Mother, C = Child, DAS = Dyadic Adjustment Scale, CDI = Child Depression Inventory, RCMAS = Revised Children's Manifest Anxiety Scale. 1 = Pretreatment, 2 = Post-intervention, 3 = 6 month post-intervention.

Significant correlations are underlined and bolded for emphasis and were determined by a 95% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain 0. Further, independent samples-t-tests were conducted examining gender differences on DAS scores across all three time points; however, there were no significant differences between mothers and fathers on DAS scores at any of the time points.

Table 3

Parallel-process latent growth models of number of sessions, DAS scores, and CDI scores with regression

	Mother			Father		
	<i>b</i>	β	90% CI	<i>b</i>	β	90% CI
Intercepts						
DAS Intercept	90.84	3.42	77.75, 101.82	102.72	4.33	92.84, 112.01
DAS Slope 1	-13.47	-0.43	-29.86, 0.35	0.20	0.01	-8.82, 9.69
DAS Slope 2	10.08	0.36	-10.68, 27.56	-11.45	-0.53	-35.60, 7.15
Direct Effects						
Number of Sessions	-0.28	-0.05	-1.45, 1.00	-0.71	-0.15	-2.03, 0.65
DAS Intercept						
DAS Slope 1	2.57	0.40	1.22, 4.14	<i>1.06</i>	<i>0.27</i>	<i>0.16, 1.97</i>
DAS Slope 2	-1.66	-0.29	-3.40, 0.22	0.53	0.12	-1.13, 2.70
Number of Sessions	-0.02	-0.22	-0.04, -0.001	0.01	0.08	-0.02, 0.03
CDI Intercept						
CDI Slope 1	-0.02	-0.23	-0.04, -0.01	<i>-0.03</i>	<i>-0.20</i>	<i>-0.06, -0.01</i>
CDI Slope 2	0.00	0.04	-0.02, 0.03	-0.01	-0.09	-0.03, 0.01
Number of Sessions	0.06	0.09	-0.04, 0.16	0.06	0.09	-0.04, 0.16
Number of Sessions	0.08	0.15	-0.05, 0.20	0.08	0.15	-0.05, 0.20
Number of Sessions	0.02	0.03	-0.11, 0.16	0.02	0.03	-0.11, 0.16
Indirect Effects						
Number of Sessions	CDI Intercept	0.01	-0.01, 0.03	-0.01	-0.01	-0.06, 0.01
Number of Sessions	DAS Slope 1	-0.05	-0.10, -0.02	<i>-0.03</i>	<i>-0.05</i>	<i>-0.09, -0.002</i>
Number of Sessions	DAS Slope 2	-0.01	-0.07, 0.02	-0.01	-0.01	-0.07, 0.01

Note. DAS = Dyadic Adjustment Scale, CDI = Child Depression Inventory. Slope 1 reflects growth from baseline to post-intervention (3 months after baseline). Slope 2 reflects growth from post-intervention to 6 months later (9 months after pretreatment).

Significant effects are in bold typeface for emphasis and were determined by a 95% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. Non-significant trends are in italic typeface and were determined 90% CIs corresponding with $p < .10$. Children's CDI intercepts are also not shown for clarity.

Table 4

Parallel-process latent growth models of number of sessions, DAS scores, and RCMAS scores with regression

	Mother			Father		
	<i>b</i>	β	90% CI	<i>b</i>	β	95% CI
Intercepts						
DAS Intercept	90.84	3.42	77.75, 101.82	102.88	4.33	90.86, 113.98
DAS Slope 1	-13.18	-0.43	-29.60, 0.72	0.24	0.01	-10.59, 11.89
DAS Slope 2	10.02	0.36	-10.48, 27.90	-11.52	-0.53	-39.92, 16.60
Direct Effects						
Number of Sessions	-0.28	-0.05	-1.45, 1.00	-0.72	-0.15	-2.05, 0.63
Number of Sessions	2.55	0.40	1.22, 4.12	<i>1.06</i>	<i>0.27</i>	-0.05, 2.15
Number of Sessions	-1.65	-0.29	-3.40, 0.26	0.55	0.12	-1.40, 3.10
DAS Intercept	0.01	0.05	-0.05, 0.08	-0.00	-0.01	-0.08, 0.09
DAS Slope 1	-0.01	-0.05	-0.04, 0.02	-0.05	-0.16	-0.16, 0.05
DAS Slope 2	0.01	0.08	-0.04, 0.06	-0.06	-0.28	-0.17, 0.02
Number of Sessions	-0.08	-0.06	-0.39, 0.21	-0.08	-0.06	-0.45, 0.27
Number of Sessions	0.10	0.09	-0.17, 0.38	0.10	0.09	-0.23, 0.43
Number of Sessions	-0.03	-0.03	-0.25, 0.22	-0.03	-0.03	-0.30, 0.28
Indirect Effects						
Number of Sessions	RCMAS Intercept	-0.00	-0.07, 0.03	0.00	0.00	-0.08, 0.11
Number of Sessions	DAS Slope 1	-0.02	-0.12, 0.05	-0.05	-0.04	-0.26, 0.03
Number of Sessions	DAS Slope 2	-0.02	-0.18, 0.03	-0.03	-0.04	-0.31, 0.07

Note. DAS = Dyadic Adjustment Scale, RCMAS = Revised Children's Manifest Anxiety Scale. Slope 1 reflects growth from baseline to post-intervention (3 months after baseline). Slope 2 reflects growth from post-intervention to 6 months later (9 months after pretreatment).

Significant effects are in bold typeface for emphasis and were determined by a 95% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. Non-significant trends are in italic typeface and were determined 90% CIs corresponding with $p < .10$. Children's RCMAS intercepts are also not shown for clarity.