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An attachment-based intervention for parents of adolescents at risk: mechanisms of change

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Mechanisms that account for treatment effects are poorly understood. The current study examined processes that may underlie treatment outcomes of an attachment-based intervention (Connect) for parents of pre-teens and teens with serious behavior problems. Parents ($N = 540$) in a non-randomized trial reported on their teen's functioning prior to and following treatment. Results confirmed significant decreases in parents' reports of teens' externalizing and internalizing symptoms, replicating prior evaluations of this program. Reductions in parents' reports of teen attachment avoidance were associated with decreases in externalizing symptoms, while reductions in parents' reports of teen attachment anxiety were associated with decreases in internalizing symptoms. Parents' reports of improved teen affect regulation were also associated with decreases in both internalizing and externalizing symptoms. Results were comparable across gender and for parents of teens with pre-treatment externalizing symptoms in the clinical versus sub-clinical range. A model of therapeutic change in attachment-based parenting programs is discussed.

Keywords: attachment-based intervention; parenting programs; adolescence; parent–teen relationship; behavior problems

Adolescence is arguably one of the most profound developmental transitions across the lifespan marked by deep neurobiological and social-relational changes, next only in significance to those occurring in infancy and early childhood (Ernst & Fudge, 2009; Spear, 2013). It is a developmental period that offers immense opportunities for positive growth, but it is also associated with vulnerability to a broad range of mental health problems, including conduct disorder, depression, anxiety, substance use disorders, and eating disorders (e.g., Andersen & Teicher, 2008; Romer & Walker, 2007; Spear, 2013). Security within the adolescent–parent relationship buffers teens from risk and is robustly associated with concurrent and prospective levels of adolescent psychological and physical health (e.g., Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Allen et al., 2002; Benson, Buehler, & Gerard, 2008; Brown & Wright, 2003; Caspers, Cadoret, Langbehn, Yucuis, & Troutman, 2005; Greenberg, Speltz, DeKlyen, & Jones, 2001; Kobak, Zajac, & Smith, 2009; Rosenstein & Horowitz, 1996; Speltz, DeKlyen, & Greenberg, 1999).

Although attachment security is associated with fewer social-emotional and behavioral problems in adolescence, few attempts have been made to translate attachment concepts into evidence based treatment programs for teens and their parents. Yet there is compelling evidence to suggest that attachment based treatments can increase security within the adolescent–parent relationship and reduce risk among teens. First, attachment security

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appears to be malleable in adolescence, even among teens who were insecurely attached to their parents in infancy. Beijersbergen, Juffer, Bakermans-Kranenburg, and van IJzendoorn (2012) found, for example, that maternal sensitive support during adolescence promoted a shift toward attachment security among teens who were insecurely attached as infants. Second, there is good evidence for the effectiveness of attachment-based programs for both adults and younger children and their parents. Emotionally focused therapies have been shown to be effective in reducing the severity of problems across a range of individual and couples problems (e.g., Greenberg, 2011; Johnson & Wittenborn, 2012). Among infants and young children, attachment based video feedback interventions (Steele et al., 2014) have been found to promote maternal sensitivity and reduce problem behaviors in children, particularly those with a reactive temperament (Bakermans-Kranenburg, van IJzendoorn, Mesman, Alink, & Juffer, 2008; Groeneveld, Vermeer, van IJzendoorn, & Linting, 2011; Klein Velderman, Bakermans-Kranenburg, Juffer, & van IJzendoorn, 2006; Moss et al., 2014). The Circle of Security program (Marvin, Cooper, Hoffman, & Powell, 2002) has also been shown to enhance parental sensitivity, resulting in significant increases in attachment security and reductions in child behavior problems (Cassidy et al., 2010; Hoffman, Marvin, Cooper, & Powell, 2006). Unless attachment security is uniquely fixed during the adolescent period, it is reasonable to expect that similar effects should emerge as a result of attachment based programs that are specifically tailored to the developmental needs of teens and their parents.

Given the considerable evidence for the protective role of adolescent–parent attachment security and the effectiveness of attachment-based interventions for other age groups, we developed a 10-week manualized group program for parents or alternative caregivers of pre-teens and teens with serious behavior problems (*Connect*; Moretti & Braber, 2013). Designed to maximize uptake, penetration and sustainability within communities, “Connect” focuses on strengthening the building blocks of secure attachment: parental reflective function and parent sensitivity; shared partnership and mutuality within the parent–teen relationship; and dyadic affect regulation. Each session begins with a discussion of an attachment principle specifically focused on adolescence (see Table 1) and common challenges in parent–teen relationships. Experiential exercises and role plays are used to: (1) help parents identify and regulate their emotional reactions to their teens’ problem behavior; (2) encourage parental reflection on the attachment needs associated their teens’ behavior and their teens’ state of mind; and (3) support parents in responding to challenging adolescent behavior with sensitivity while maintaining clear expectations and setting limits.

Like all parenting programs, the goal of *Connect* is to promote effective parenting by helping parents reduce their reliance on coercive or unproductive parenting strategies. Yet *Connect* differs substantially from parent management programs that are rooted in social learning theory and focus on teaching specific parenting techniques that alter behavior contingencies (e.g., setting ground rules; enforcing logical consequences). Instead, *Connect* focuses on helping parents to “step back” from strong emotional reactions to their teens’ behavior and “step into” their teen’s state of mind, specifically promoting awareness, availability and empathy to their teens’ attachment needs. Although an attachment based approach does not preclude setting expectations, limits and consequences for problem behavior, attention to these issues is secondary to and follows rather than precedes attention to their teens’ needs for safe haven and secure base. Mindfulness helps parents to better understand the issues that drive their teens’ problem behavior and parental sensitive support helps teens manage challenging emotions, promoting a shared partnership between teen and parent that is essential for healthy autonomy.

Table 1. Connect parent group principles and goals.

Session	Principle	Key learning goals and skills for parents
1	<i>All Behaviour has Meaning</i> Attachment is a basic human need that shapes behaviour.	Recognize behaviour as a form of communication about attachment. Develop skills in stepping back and considering alternate meanings of behaviour.
2	<i>Attachment is for Life</i> The need for attachment continues from cradle to grave, but how it is expressed changes with development.	Identify attachment needs. Recognize behaviour of infants, children and teens as expressions of attachment needs.
3	<i>Conflict is Part of Attachment</i> When expressed and responded to constructively, conflict offers new opportunities for growth.	Recognize that conflict is a normative part of relationships, particularly for parents and teens. Practice stepping back, managing affect and being present in the face of conflict.
4	<i>Autonomy Includes Connection</i> Secure attachment balances connection and independence.	Recognize that teens strive for autonomy but continue to need connection with parents. Acceptance and support of autonomy with structure and safety.
5	<i>Empathy – The Heartbeat of Attachment</i> Empathy supports growth and strengthens our relationships.	Empathy is not about solving a problem. Empathy does not condone problem behaviour. Empathy is a skill and takes time to practice and develop.
6	<i>Balancing our Needs with the Needs of Others</i> Relationships thrive when we have empathy and balance our needs with the needs of others.	Acknowledgement of attachment needs in parents. Acceptance that children and teens cannot meet the attachment needs of parents, who must develop other sources of support.
7	<i>Growth and Change are Part of Relationships</i> Growth and change involves moving forward while understanding the past.	Understand that how we see ourselves and how others see us can promote or impede change. Become aware of our story about our teen that gets in the way of change.
8	<i>Celebrating Attachment</i> Attachment brings joy and pain.	Recognize importance of celebrating attachment and joy in our relationships; avoidance of conflict is not sufficient to sustain us. Become aware of barriers to celebrating attachment in our relationships with our teens.
9	<i>Two Steps Forward, One Step Back: Staying on Course</i> Trust relationships in turbulent times. Adversity is an opportunity for growth.	Understand that the meaning we attach to setbacks determines how we respond to them. Setbacks offer opportunities for repair, reconciliation and strengthening our relationships.

Preliminary evaluation of the Connect program has produced promising results. Moretti and Obsuth (2009) reported significant reductions in parents' reports of teens' oppositional, aggressive and antisocial behavior, as well as decreases in anxiety and depression following completion of the Connect program compared to the waitlist period (where no significant changes were noted). Parents also reported significant increases in

their sense of parenting satisfaction and efficacy. Not only were treatment gains maintained at one-year follow-up, but parents also reported additional declines in youths' externalizing and internalizing symptoms over time.

These results were replicated in a portability study (Moretti & Obsuth, 2009) with over 300 parents of teens with severe behavior problems located in 17 rural and urban communities. Parents reported significant reductions in teens' externalizing and internalizing symptoms, with effect sizes in the small to moderate range, and significant improvements in teens' social and school participation, as well as global functioning. Moderate to large effect size reductions were found in teen-to-parent and parent-to-teen verbal and physical aggression. Lastly, parents reported moderate to large increases in parenting satisfaction and perceived parenting competence, as well as reductions in caregiver strain, including decreased feelings of anger, resentment and embarrassment as well as fewer work and financial difficulties resulting from their teens' problems. Follow up at one-year post-treatment showed good retention of treatment gains (Moretti & Obsuth, 2009). An independent study assessed the feasibility and preventative effects of Connect in a normative sample of Italian adolescents between the ages of 11–14 (Giannotta, Ortega, & Stattin, 2013). Teen self-reported use of wine and beer was significantly lower among those whose parents completed Connect compared with teens whose parents were in the control group (medium effect size).

The effectiveness of this program is promising; however it is not clear that these treatment outcomes are due to attachment-related mechanisms or processes. There is growing interest in identifying “mechanisms of action” that account for treatment outcomes as this work can shed light on therapeutic models and lead to refinements that maximize effective treatment elements and minimize extraneous components. In turn, these refinements may streamline professional training, reduce treatment time for practitioners and clients, and potentially reduce costs.

In a recent study, we examined whether shifting parenting representations was a key driver of the effectiveness of Connect (Moretti, Obsuth, Mayselless, & Scharf, 2012). Shifting parenting representations toward greater mutuality, positivity and security is believed to promote parental sensitivity, warmth and consistency. As parents become more sensitive to perceiving and responding to their teens' attachment needs and provide a greater sense of safe haven and secure base, teens are likely to experience greater security within the attachment relationship. This in turn may buffer teens from negative influences, such as delinquent peer groups, that are known to increase risk for problem behaviors. Furthermore, the availability of the parent as a safe haven and secure base and support may foster the development of autonomous affect regulation and problem solving skills in teens (see Figure 1).

Using the Parenting Representations Interview-Adolescence (PRI-A; Scharf, Mayselless, & Kivenson-Baron, 1997/2000 cited in Mayselless & Scharf, 2006), Moretti et al. (2012) assessed parenting representations prior to and following completion of the Connect program. Results confirmed significant reductions in parents' reports of externalizing and internalizing symptoms using the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). Importantly, these reductions were significantly related to changes in parenting representations, specifically: pre-to post-treatment shifts in parents' narratives toward greater understanding of their teen; greater trust and confidence in their teens' capacities; and more elaborate perceptions of their teen now and in the future were associated with decreases in their reports of externalizing and internalizing symptoms. In addition, compared to pre-treatment, parents' post-treatment narratives revealed increased secure base, mutuality, and positive feelings about the parent-adolescent relationship.

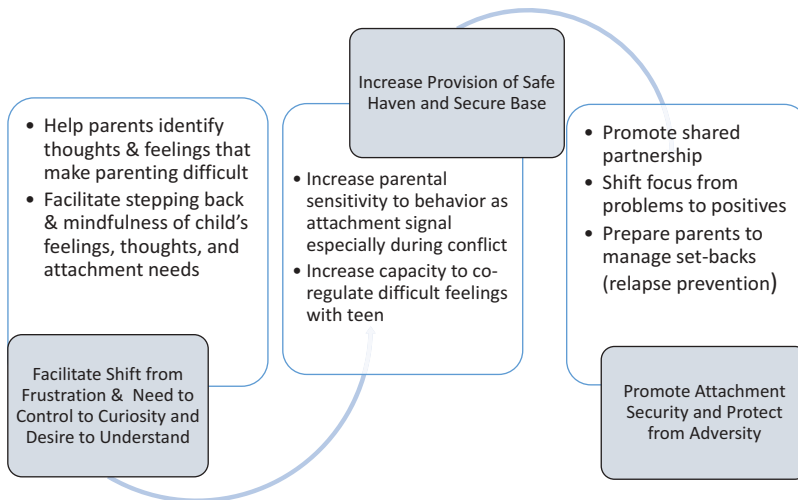


Figure 1. Mechanisms of change in attachment-based parenting interventions.

The current study builds on this research by further examining mechanisms of change that underlie treatment outcomes in an attachment-based parenting program, Connect. We reasoned that since Connect focuses on increasing parents' recognition of and sensitive responding to the attachment needs underlying their teens' problem behaviors, treatment should promote greater attachment security in the parent–teen relationship and, more specifically, decreases in attachment avoidance and attachment anxiety. Drawing on Bowlby's (1969, 1973, 1979) conceptualization of attachment as a biologically based regulatory system and an affect regulation strategy (Mikulincer & Shaver, 2007; Pietromonaco, Barrett, & Powers, 2006), we further predicted that treatment should be associated with parents' reports of significant decreases in dysregulation of affect. We conceptualized reductions in attachment avoidance, attachment anxiety and affect dysregulation as mechanisms that account for treatment outcomes, testing the extent to which decreases in each were related to parents' reports of decreases in externalizing and internalizing symptoms. In light of the fact that attachment avoidance, attachment anxiety, and affect dysregulation co-occur and jointly influence symptoms, we also tested the unique variance that each accounted for in relation to treatment outcomes. We examined whether results were comparable across gender and were similar in youth with parent-reported pre-treatment levels of externalizing symptoms in the clinical range (> 70th percentile) versus sub-clinical range. These hypotheses were examined in a large sample of parents who completed the Connect program and reported on their teens' levels of externalizing and internalizing symptoms, attachment avoidance and anxiety, and affect dysregulation before and following treatment. Although data for this study was not drawn from a randomized clinical trial, our sample size provides an opportunity for the formulation of a preliminary model of change for an attachment-based treatment (see Figure 1) that can be evaluated in further research.

Method

Participants

Parents who attended the program were referred by community mental health centers or schools due to concerns regarding their teen's mental health and behavioral functioning.

To avoid dependency in the data, reports from only one caregiver per youth were retained when multiple caregivers were available (102 cases excluded). Given the overwhelming majority of parents who attended the program were mothers (76.3%), maternal caregivers were retained wherever possible to limit variability in the sample. As only a small number of caregivers were foster parents ($N = 45$), the current study retained only biological, adoptive, or family members who assumed parental roles. To be included in the study, parents were required to attend at least 70% of Connect sessions (242 cases excluded¹) to ensure sufficient treatment exposure, and must have completed both pre- and post-treatment measures (186 cases excluded).

The final sample included 540 parents (83% female; $M_{age} = 44.01$, $SD_{age} = 8.29$) of 540 adolescents (261 girls, $M_{age} = 14.05$, $SD_{age} = 2.33$ and 279 boys, $M_{age} = 13.87$, $SD_{age} = 2.82$). The majority of parents were biological mothers of teens (76.3%). A small percentage were biological fathers (10.9%), adoptive or step mothers (7%), other female relatives (e.g., grandmother, aunt; 4.8%), or adoptive or step fathers (0.9%). Independent samples *t*-tests revealed no significant differences between retained and excluded cases in demographic characteristics (e.g., mean age of youth, level of education, family income) or parent reports of youths' pre-treatment levels of insecure attachment (attachment anxiety and avoidance), behavior problems (internalizing and externalizing), or affect dysregulation between caregivers.

Although diagnostic information was not available on this sample, information provided by parents prior to treatment in a semi-structured interview revealed a high frequency of maltreatment experiences, threats of self-harm or harm to others, and substance use among teens. Parents completing the interview ($N = 496$) indicated that in the six months prior to treatment, 51.9% of teens had witnessed family or community violence, 14.8% were victims of physical abuse, 10.6% were victims of sexual abuse, and 18.1% were victims of neglect. Almost one third of teens had threatened to harm (29.3%) or kill themselves (34.1%); almost one quarter (23.9%) had threatened to harm others and 16.3% had threatened to kill others. Finally, parents reported that almost one third (29.1%) of teens engaged in alcohol use in the past six months and 21.5% engaged in illicit drug use.

Demographic information was available for 86% of caregivers ($N = 465$). The majority (80.6%) self-identified as Caucasian; 9.4% as Aboriginal; 5.5% as Asian; and the remaining 4.5% self-identified as Hispanic, East Indian, Caribbean, African, or Filipino. With respect to education, 7.6% had completed some high school, 24.3% graduated from high school; 14.4% had attended some college or university courses and over half (53.8%) obtained a postsecondary degree.

Measures and procedure

Parents reported on their perceptions of their teens' behavior problems, attachment avoidance, attachment anxiety and affect dysregulation within a three-week period prior to treatment and within a three-week period following the final treatment session.

The Brief Child and Family Phone Interview (BCFPI; Cunningham, Pettingill, & Boyle, 2000) was developed as a standardized assessment and service evaluation tool. Derived from the Ontario Child Health Study scales (OCHS), the BCFPI includes many items in common with the CBCL (Boyle et al., 1993). In the current study, the BCFPI parent self-report scales were administered in paper format. These scales possess excellent psychometric properties and have been used in large-scale epidemiological studies (Boyle et al., 2009). Six domains of functioning related to DSM-IV diagnoses:

Attention-Deficit/Hyperactivity Disorder (regulation of attention), Oppositional Defiant Disorder (cooperativeness), Conduct Disorder (conduct problems), Separation Anxiety Disorder (separation anxiety), Anxiety/Depression (managing anxiety), and Dysthymia (managing mood). The BCFPI generates three composite scores: total problems, externalizing problems, and internalizing problems. In the current study, we utilized the externalizing and internalizing symptoms composite scores at pre-treatment ($\alpha = .87$ and $\alpha = .89$, respectively) and post-treatment ($\alpha = .90$ and $\alpha = .90$, respectively). T-scores, standardized based on a distribution with a mean of 50 and a standard deviation of 10, were used in the current study. T-scores of 70 or above (two or more standard deviations above the mean) are considered to be in the clinical range (Cunningham, Pettingill, & Boyle, 2006).

The Affect Regulation Checklist (ARC; Moretti, 2003) is a 12-item measure adapted from published scales of emotion regulation (Gross & John, 1998, 2003; Shields & Cicchetti, 1997) and augmented with supplementary items to tap three dimensions of affect regulation in adolescents. The current study used an adapted parent-report format of the ARC to measure adolescent affect regulation. In keeping with contemporary models, the ARC is based on a multidimensional view of emotion regulation that includes both maladaptive (e.g., lack of affect control, affect suppression) and adaptive (e.g., affect reflection) aspects of regulation. The ARC assesses regulatory characteristics independent of specific emotions; items do not make reference to specific emotions to avoid confounding regulatory processes with emotional states. The ARC yields three factors: Affect Dysregulation (4 items; e.g., “They have a hard time controlling their feelings”; “It’s very hard for them to calm down when they get upset”), Affect Suppression (5 items; e.g., “They try hard not to think about their feelings”; “They try to do other things to keep their mind off of how they feel”), and Adaptive Reflection (3 items; e.g., “Thinking about why they have different feelings helps them to learn about themselves”). Items are scored on a 3-point scale ranging from “Not like my child” to “A lot like my child” and ask about experiences of affect in general. The three-factor structure of the ARC and its relationships with emotional and behavioral problems has been confirmed in previous research (Moretti & Craig, 2013; Penney & Moretti, 2010). Given its direct relevance to the deleterious impact of insecure attachment, the current study focused specifically on the affect dysregulation subscale ($\alpha = .89$ and $.90$ for pre- and post-treatment, respectively).

The Comprehensive Adolescent-Parent Attachment Inventory (CAPAI; Moretti, McKay, & Holland, 2000) is a 36-item measure of adolescent-parent attachment. Items were drawn from Brennan, Clark, and Shaver’s (1998) Experiences in Close Relationships (ECR) scale adapted to tap attachment avoidance and attachment anxiety in the parent-teen relationship. Parents reported on their perception of their adolescents’ attachment to them by rating each statement on a 7-point scale ranging from 1 = “Disagree strongly” to 7 = “Agree strongly”. Consistent with the ECR and other self-report measures of attachment, two superordinate factors emerge from the CAPAI: attachment anxiety (e.g., “If my youth can’t get me to show interest in him/her, he/she gets upset or angry”; “When my youth is away from me, he/she feels anxious and afraid”; $\alpha = .88$) and attachment avoidance (“Whenever we get close, my youth pulls back from me”; “My youth finds it difficult to depend on me”; $\alpha = .90$). The factor structure and convergent validity of the CAPAI have been supported in previous research (McKay & Steiger, 2003; Steiger & Moretti, 2003, 2005, 2008; Steiger, Moretti, & Obsuth, 2009).

Results

Descriptive analyses

Means and standard deviations for all study variables are presented in Table 2. Change in symptom levels, affect dysregulation and attachment was computed using difference scores from pre- to post-treatment. Repeated measures MANOVA confirmed significant reductions in all study variables ($F(5, 535) = 38.59, p < .001$; see Table 2 for means and effect sizes). For these analyses, effect sizes are reported using standard guidelines for interpreting Cohen's (1988) d statistic for small ($d = .2$), medium ($d = .5$) and large ($d = .8$) effect sizes. Reductions fell in the small (internalizing symptoms: $d = .19$; attachment avoidance: $d = .22$; attachment anxiety: $d = .09$) to medium (externalizing symptoms: $d = .37$; affect dysregulation: $d = .40$) effect size range. Zero-order correlations are presented in Table 3. All variables of interest were significantly correlated, with the exception of attachment avoidance and internalizing symptoms.

Are changes in attachment avoidance and attachment anxiety associated with decreases in externalizing and internalizing symptoms?

We tested whether changes in parents reports of adolescent attachment avoidance and attachment anxiety were related to post-treatment symptoms, controlling for pre-treatment symptom scores. This conservative approach allowed us to examine the unique impact of changes in attachment on post-treatment symptoms irrespective of pre-treatment symptom levels. For these regressions, effect sizes were determined using Ferguson's (2009) recommendations for interpreting results from social science and clinical data, where $\Delta R^2 = .04$ is a small, $\Delta R^2 = .25$ is a moderate and $\Delta R^2 = .64$ is a large effect size. A minimum effect size of $\Delta R^2 = .04$ is recommended for practical significance in social science and clinical research (Ferguson, 2009).

Controlling for pre-treatment symptoms, reductions in attachment avoidance were associated with lower levels of youth post-treatment externalizing symptoms ($\Delta R^2 = .04$; $\beta = .20, F(1, 539) = 332.85, p < .001$). Reductions in attachment avoidance were also associated with lower levels of post-treatment internalizing symptoms ($\Delta R^2 = .01$; $\beta = .09; F(1, 539) = 306.78, p < .001$), however this small effect did not reach the recommended threshold for clinical significance (Ferguson, 2009).

Controlling for pre-treatment symptoms, reductions in attachment anxiety were associated with lower levels of post-treatment internalizing symptoms ($\Delta R^2 = .05$; $\beta = .22; F(1, 539) = 360.28, p < .001$). Reductions in attachment anxiety were also

Table 2. Summary of means, standard deviations, and mean differences for behavior problems, affect dysregulation, and attachment.

Variable	Pre-treatment	Post-treatment	Cohen's d
	$M (SD)$	$M (SD)$	
Externalizing symptoms	72.65 (12.94)	67.84 (13.07)	.37
Internalizing symptoms	64.43 (14.56)	61.67 (14.49)	.19
Affect dysregulation	3.69 (1.09)	3.25 (1.13)	.40
Attachment avoidance	3.42 (1.28)	3.14 (1.22)	.22
Attachment anxiety	3.38 (1.14)	3.28 (1.12)	.09

Table 3. Zero-order correlations between behavior problems, affect dysregulation, and attachment at pre- and post-treatment.

	1	2	3	4	5	6	7	8	9
1. T1 Externalizing Symptoms									
2. T1 Internalizing Symptoms	.25***								
3. T1 Affect Dysregulation	.55***	.34***							
4. T1 Attachment Avoidance	.35***	.00	.22***						
5. T1 Attachment Anxiety	.32***	.58***	.35***	.06					
6. T2 Externalizing Symptoms	.72***	.28***	.47***	.28***	.34***				
7. T2 Internalizing Symptoms	.21***	.73***	.31***	.02	.49***	.38***			
8. T2 Affect Dysregulation	.45***	.30***	.64***	.16***	.32***	.63***	.44***		
9. T2 Attachment Avoidance	.31***	.05	.20***	.80***	.07	.39***	.12**	.29***	
10. T2 Attachment Anxiety	.29***	.55***	.33***	.04	.76***	.37***	.62***	.41***	.14**

Note: T1 = pre-treatment; T2 = post-treatment.

*** $p < .01$, ** $p < .001$.

associated to lower levels of post-treatment externalizing symptoms ($\Delta R^2 = .01$; $\beta = .07$; $F(1, 539) = 292.14$, $p < .05$), however the effect size did not reach the recommended threshold for clinical significance.

Are changes in affect dysregulation associated with decreases in externalizing and internalizing symptoms?

Controlling for pre-treatment symptoms, decreases in youth affect dysregulation were significantly associated with lower levels of post-treatment externalizing ($\Delta R^2 = .09$; $\beta = .29$; $F(1, 539) = 404.50$, $p < .001$) and internalizing symptoms ($\Delta R^2 = .04$; $\beta = .20$; $F(1, 539) = 348.40$, $p < .001$).

Do changes in attachment avoidance, attachment anxiety and affect dysregulation contribute uniquely to treatment outcomes?

As reductions in all three independent variables were significantly related to decreases in externalizing or internalizing symptoms or both, we blocked these predictors together in a final model to evaluate their unique contributions to treatment outcomes (see Table 4). Controlling for pre-treatment symptoms, reductions in attachment avoidance ($\beta = .19$, $p < .001$) and affect dysregulation ($\beta = .38$, $p < .001$) were each uniquely related to lower levels of post-treatment externalizing symptoms. However, reductions in attachment anxiety were not significantly related to lower levels of post-treatment externalizing symptoms ($\beta = -.01$, $p = .85$). Even after controlling for 52% of the variance accounted for by the relationship between pre- and post-treatment levels of externalizing symptoms, attachment avoidance and affect dysregulation explained an additional 10% of the variance in levels of post-treatment externalizing symptoms, indicating a small to moderate total effect.

For internalizing symptoms, controlling for pre-treatment symptoms, reductions in attachment anxiety ($\beta = .19$, $p < .001$) and affect dysregulation ($\beta = .16$, $p < .001$) were associated with lower levels of post-treatment internalizing symptoms. However, reductions in attachment avoidance were not significantly related to lower levels of

Table 4. Linear regression models of the effects of pre- to post-treatment change scores of affect dysregulation, attachment avoidance and attachment anxiety on post-treatment behavior problems.

Outcome		<i>B</i>	<i>SE(B)</i>	β	ΔR^2
T2 externalizing symptoms	Block 1				.52***
	T1 Externalizing Symptoms	.73	.03	.72***	
	Block 2				.10***
	Affect Dysregulation	3.60	.39	.26***	
	Attachment Avoidance	2.08	.46	.13***	
T2 internalizing symptoms	Block 1				.53***
	T1 Internalizing Symptoms	.74	.03	.74***	
	Block 2				.07***
	Affect Dysregulation	3.44	.53	.16***	
	Attachment Avoidance	.13	.52	.01	
	Attachment Anxiety	2.46	.44	.19***	

*** $p < .001$.

post-treatment internalizing symptoms ($\beta = -.01, p = .85$). Even after controlling for the relation between pre- and post-treatment levels of internalizing symptoms, which explained 53% of the variance, reductions in affect dysregulation and attachment anxiety accounted for an additional 7% of the variance in post-treatment internalizing symptoms, indicating a small total effect.

Are results comparable across gender?

To examine youth gender as a potential moderator, multi-group comparison models were carried out in a path analysis framework in AMOS 19.0 (Arbuckle, 2006). Chi-square differences were calculated on the final regression models for each of the dependent variables in order to determine whether models differed based on youth gender. Results revealed that there were no significant gender differences in model fit for both externalizing ($\Delta\chi^2(4) = 3.8, p = .43$) and internalizing symptoms ($\Delta\chi^2(4) = 4.42, p = .35$). In addition, no gender moderation was found for any of the relationships between variables within the model.

Are results comparable for teens with pre-treatment symptoms in the clinical range (70% percentile or above)?

The pattern of findings among youth with clinical levels of pre-treatment externalizing symptoms (T-score > 70; $N = 339$) was examined to determine if it was comparable to that for youth with sub-clinical levels of externalizing symptoms. Consistent with findings for the full sample, results revealed significant pre-post reductions in youth externalizing symptoms ($d = .69$), internalizing symptoms ($d = .21$), affect dysregulation ($d = .53$), attachment anxiety ($d = .10$), and attachment avoidance ($d = .24$; $F(5, 534) = 31.45, p < .001$). Results also revealed a greater decrease in externalizing symptoms for those in the clinical range compared to those in the sub-clinical range ($F(1) = 49.83, p < .001$).

Multi-group comparison models were completed in a path analysis framework in AMOS 19.0 (Arbuckle, 2006) to examine the comparability of associations between changes in attachment avoidance, attachment anxiety, affect dysregulation and treatment outcomes for youth with clinical versus subclinical levels externalizing symptoms. Results revealed no significant differences between the groups for levels of post-treatment internalizing ($\Delta\chi^2(4) = 5.1, p = .27$) or externalizing symptoms ($\Delta\chi^2(4) = 8.7, p = .07$). These results suggest that although treatment was associated with greater reductions in externalizing symptoms for youth with pre-treatment externalizing symptoms in the clinical range, compared to those who score in sub-clinical range, the association between change mechanisms and post-treatment symptoms appears the same for both groups.

Discussion

Intervention research provides a unique opportunity to investigate the mechanisms and processes that underlie the effectiveness of attachment based treatments and such work has the potential to shape the refinement of programs to maximize active ingredients. In our prior work we confirmed that shifting parenting representations through an attachment-based parenting group was significantly related to reductions in adolescents' problem behaviors (Moretti & Obsuth, 2009). The current study adds to these findings by examining two mechanisms that may also be associated with treatment outcomes:

reductions in attachment insecurity (attachment avoidance and attachment anxiety) and reductions in affect dysregulation.

We proposed that attachment based treatment should produce significant reductions in attachment anxiety, attachment avoidance and affect dysregulation, and in turn these changes should predict decreases in levels of problem behavior. Our results supported these predictions. Reductions in attachment avoidance were significantly related to decreases in teens' levels of externalizing symptoms over the course of treatment. In addition, reductions in attachment anxiety were significantly associated with decreases in teens' levels of internalizing symptoms. Although statistically significant associations were found between reductions in attachment avoidance and internalizing symptoms and between reductions in attachment anxiety and externalizing symptoms, in neither case did these effects meet the threshold for clinical significance. Thus the current findings suggest that treatment-related decreases in these two aspects of attachment insecurity (avoidance and anxiety) may be differentially related to two domains of treatment outcomes (externalizing and internalizing symptoms), a finding that warrants further investigation.

As predicted, we also found that reductions in affect dysregulation were significantly related to decreases in teens' levels of externalizing and internalizing symptoms. To determine the unique contribution of changes in attachment avoidance, attachment anxiety and affect dysregulation to treatment outcomes, all three factors were examined together. Reductions in affect dysregulation and attachment avoidance accounted for 10% of the variance in lower post-treatment externalizing symptoms even after controlling for pre-treatment symptom levels. Similarly, reductions in affect dysregulation and attachment anxiety accounted for 7% of the variance in lower post-treatment internalizing symptoms even after controlling for pretreatment symptom levels.

To investigate whether treatment-related changes applied equally across our sample, we examined potential gender differences as well as differences related to teens' pre-treatment symptom levels. Reductions in attachment avoidance were similarly associated with decreases in externalizing symptoms for girls and boys, as were reductions in attachment anxiety in relation to decreases in internalizing symptoms. The relation between reductions in affect dysregulation and decreases in externalizing and internalizing symptoms was also comparable for girls and boys. In addition, a comparable pattern of results was found for youth with pre-treatment externalizing symptoms in the clinical range compared to youth with scores in the sub-clinical range. Thus our findings suggest that the mechanisms underlying attachment-based treatment outcomes are similar across gender and across varying levels of clinical severity.

The current findings, in conjunction with our prior research on parenting representations (Moretti et al., 2012), suggest that change within attachment based treatments may unfold in a stepwise manner. We propose that therapeutic change unfolds in three phases (see Figure 1). Before parents can be available to step into the mind of their teen, they must step back from their emotional reactions and attributions for their teens' challenging behavior. Role play and exercises help parents become aware of their thoughts and feelings and how these drive their parenting behavior. With practice parents can temporarily put their emotional reactions on hold, allowing them to be mindful about their teens' feelings, thoughts and attachment needs. As a result parents are better positioned to respond to their teen with sensitivity, promoting safe haven and secure base and engendering a shared partnership that supports adolescent autonomy. In the last phase of treatments, role play and exercises help shift parent attention away from challenging behavior and toward the identification and celebration of connection. As treatment comes

to a close, parents learn to anticipate and cope with inevitable setbacks, hence protecting new found security within their relationship with their teen from adversity.

The model of change that we have proposed includes processes that may be critical in other attachment based interventions. For example, in Attachment-Based Family Therapy (ABFT; Diamond, Creed, Gillham, Gallop, & Hamilton, 2012; Diamond, Reis, Diamond, Siqueland, & Isaacs, 2002; Diamond et al., 2010; Diamond et al., 2012), therapists first work alone with parents to facilitate awareness and sensitivity to attachment injuries experienced by their teens. This phase of therapy is likely associated with shifts in parenting representations. Therapy progresses to family sessions that include reparative work with the goal of increasing attachment security and providing a more stable foundation for adolescent growth and autonomy.

The current study adds to increasing evidence for effectiveness of attachment based treatments for teens yet we are mindful of important limitations in our work. First and foremost, the current study does not take the place of a randomized clinical study. As a result we can reach no firm conclusions that the therapeutic improvements observed in our study were unique to the current treatment. Nonetheless, our findings provide promising support for an attachment based parenting program for teens. Additional research using a randomized control design is required to confirm these results.

Second, our results are entirely based on parent reports of their teens' functioning. This is a significant limitation and we acknowledge that what appears to be changes in behavior symptoms, attachment and affect regulation may merely reflect changes in parental perceptions, beliefs and attributions. On a promising note, however, Giannotta et al. (2013) did find treatment effects for Connect that were based on youth self-reports and past research has found that parental attributions are significantly related to parenting behavior and ultimately to child behavior (Johnston & Ohan, 2005). Nonetheless, it is critical that future research include youth self-report information and collateral indicators not only to confirm that treatment changes reported by parents truly reflect changes reported by teens, but also because such information is needed to better understand therapeutic change processes in both parents and their children. Third, we measured behavior problems, attachment and affect regulation only twice, prior to and following treatment. As a result we cannot confidently conclude that changes in attachment anxiety, attachment avoidance and affect regulation underlie therapeutic gains. To examine mechanisms of change, measurements should be taken at least three times and ideally and preferably more often over the course of treatment.

Fourth, it is likely that multiple mechanisms underlie therapy change of any sort. Researchers tend to select mechanisms that are consistent with the theoretical model from which interventions are derived, but multiple mechanisms representing diverse and potentially competing models of change should ideally be tested. Such work may provide insight into the unique and shared mechanisms that account for therapeutic change across different treatment modalities. Finally, our sample was drawn from clinics serving parents of teens with significant externalizing behavior. Although the majority of these teens also struggled with internalizing symptoms such as depression and anxiety, it is possible that our proposed model of change best applies to parents of adolescents with externalizing symptoms. The applicability of this model to other clinical populations requires further evaluation.

Despite these limitations, the current findings shed light on potential mechanisms that underlie change in an attachment-based parenting program for parents of adolescents – attachment avoidance, attachment anxiety and affect regulation. As attachment-based interventions are developed for different age groups and clinical populations, our

understanding of change mechanisms will no doubt evolve. Such knowledge will unquestionably deepen our understanding of attachment across the lifespan and the application of attachment concepts in therapeutic contexts.

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Note

1. In the full sample, 77% of all parents attended 70% or more sessions. Of those excluded, 55 had completed six sessions, 44 completed five sessions, and 143 completed less than five sessions.

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