

## Mediation Analysis of Mode Deactivation Therapy (Reanalysis and Interpretation)

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### Abstract

A key component of Mode Deactivation Therapy (MDT) is the development of self-awareness and regulatory skills by the client with the aim of helping adolescent males with conduct disordered behaviors, including sexually inappropriate behaviors and emotional dysregulation. The goal includes altering specific behaviors to fall within socially acceptable norms. In MDT the intervention of Validation-Clarification-Redirection (VCR) is the fulcrum of the transformation of detrimental learned beliefs about the adolescents' environment that manifest destructive behaviors into ideas about the world and those in it, into functional beliefs that are more balanced and lead to more compliant behaviors. While evidence suggests that this is the mechanism of change, a study specifically identifying the impact of the introduction and use of this skill has not been conducted to date. The purpose of this study was to examine the effect of MDT in both meta-analysis of total outcome versus Cognitive Behavioral Therapy (CBT) and mediation analysis of the VCR variable of MDT. The population includes adolescents with co-existing problems of conduct, opposition personality traits and history of trauma.

### Keywords

Mode Deactivation Therapy (MDT), Cognitive Behavioral Therapy (CBT), Posttraumatic Stress Disorder (PTSD), Anxiety, Anger, Aggression, Internalizing Disorders, and Externalizing Disorders

Mode Deactivation Therapy (MDT) is the melding of key components of Cognitive Behavior Therapy, Acceptance and Commitment Therapy, Dialectical Behavior Therapy, Functional Analytic Psychotherapy and Mindfulness, and Meditation from ancient Buddhist practices. MDT was developed to address complex presenting problems accompanying the treatment of male adolescents (Apsche, Bass, & Siv, 2006). Among the variety of adolescent disorders, MDT has proven to be efficacious in working with behavioral expressions of misaligned emotional states, including anxiety and traumatic stress (Apsche & Bass, 2006; Apsche et al., 2006), physical aggression (Apsche, Bass, & Houston, 2007), and inappropriate sexual behaviors (Apsche, Bass, Jennings, Murphy, Hunter, & Siv, 2005).

The MDT method suggests that the adolescent male develops beliefs, based on life experiences and interactions with others that he utilizes to inform his decisions and choices. Thus, MDT focuses on providing individuals with a new understanding of the beliefs that continue to contribute to unhealthy and misguided behaviors. For example, aggression is viewed as a maladaptive response to a belief that is unbalanced. It is reinforced by an immediate reduction in emotional arousal and/or the environment's response (Apsche & DiMeo, in press). A key to opening the door to this innovative perception of the world is the Validation, Clarification and Redirection (VCR) intervention. VCR provides the adolescent with the feedback that his way of viewing his world is reasonable given his set of experiences (validation), but also provides that those experiences might have skewed his view of the world (clarification) and it is possible that a less extreme or more balanced approach is more realistic (redirection).

MDT gains support as an efficacious intervention as evidence suggests that the tools developed via MDT sessions reduces the level and frequency of aggressive incidents, sexual behaviors, and emotional dysregulation (Apsche & Bass, 2006; Apsche et al., 2006; Apsche et al., 2007). These studies also demonstrate MDT exercises effectiveness across a wide variety of behavioral outcomes. Across these challenging behaviors, the development of the use of VCR appears to enable adolescents to make more balanced behavioral choices. The following analysis draws from the body of evidence, which supports the effectiveness of MDT to clarify which aspect of the intervention is effectuating change, focusing on the implementation of the VCR intervention.

We attempted to follow Kazdin's (2007), and Kazdin & Nock's (2003) suggestions throughout our analysis of the MDT data in this article. There continues to be a consensus of agreement that it is imperative to systematically evaluate treatment approaches and the processes and components through which treatments have demonstrated their effect (Kazdin, 2007). The aforementioned consensus of agreement has resulted in research focusing on the processes of change involving mediation analysis (McKinnon, Fairchild, & Fretz, 2007).

Henggeler et al. (2009) examined specific interventions and evaluated whether changes in their actions were consistent with Kazdin's (2007) suggestions of examining the specific components that are necessary, sufficient, and facilitate therapeutic changes (Kazdin, 2003).

MDT has been shown to be an effective treatment for a variety of adolescent disorders, (Apsche et al., 2006) including oppositional and conduct disordered youth, (Apsche, Bass, & Murphy, 2004, ado-

lescents who exhibit physical aggression, (Apsche et al., 2007), sexual and offending behavior, (Apsche et al., 2005), as well as symptoms of anxiety and traumatic stress, (Apsche & Bass, 2006). Apsche and DiMeo (2010) presented a chapter that included a meta-analysis of MDT with individuals, families and a replication study. The MDT meta-analysis study included 38 published studies and data accumulated but unpublished. Apsche and DiMeo (2010) analyzed a total of 458 adolescents who were included in the individual MDT studies, 61 of which were included for the Family MDT studies and 30 adolescents who were in replication studies. The meta-analysis suggested that MDT, family and individual (Apsche, Bass, & DiMeo, 2011) were effective in sexually aggressive and physically aggressive behaviors as well as reducing scores on the CBCL, Achenbach (1991), and STAXI II, Spielberger (1999). Findings also included large effect sizes in all areas, suggested by a 7% recidivism rate over two years post treatment. The findings, which were supportive of the MDT approach and the meta-analysis demonstrate that MDT was significantly more effective than CBT in every category measured including anger, aggression, and recidivism.

Mode Deactivation Therapy (MDT) is a derivative of Cognitive Behavioral Therapy (Beck, 2011), Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 2012), Dialectical Behavior Therapy (Linehan, 1993), Functional Analytic Psychotherapy (Tsai et al., 2009), and Mindfulness and Meditation from ancient Buddhist practices. Over the course of its continued development and refinement, MDT has evolved into a Contextual Treatment (Apsche & DiMeo, in press). This evolution has continued to produce results that are efficacious (Apsche & DiMeo, 2010). As mentioned earlier, the results were promising, yet incomplete. That meta-analysis examined many related articles and was, at the time of writing, current and updated. However, it lacked a comprehensive inclusion of a variety of different directions of the method and its application. Since that publication, Apsche et al. (2011) have completed a large data analysis study that was not included in the Apsche and DiMeo (2010) publication. Apsche et al. (2011) completed a comprehensive meta-analysis that examined 573 adolescents treated with MDT.

Evaluations of mediators are sparse in the contextual literature. Levin, Thildebrandt, Lillis, and Hayes (2011) compiled a detailed component analysis of the effect of psychological flexibility on experimental avoidance. While Neacsiu, Rizvi, and Linehan (2009) offered a theoretical article that explored potential mediators that could be associated with Dialectical Behavior Therapy. These studies were carried out to examine the specific components that contributed to efficacy with their treatment approaches. Given the dearth of research directly analyzing the effect of mediating events on therapeutic outcomes, the current study attempts to add to the literature by investigating the key components in MDT, specifically the VCR component.

**Table 1.** Participant Demographic Characteristics

Axis I Characteristics %	
Conduct Disorder	51%
Oppositional Defiant Disorder	42%
Posttraumatic Stress Disorder	54%
Other Secondary	28%
Axis II Beliefs %	
Mixed	56%
Borderline Personality Disorder	38%
Narcissistic Personality Disorder	28%
Histrionic Personality Disorder	2%
Dependent Personality Disorder	30%
Antisocial Personality Disorder	20%
Ethnicity/Race %	
African American	52%
Caucasian	43%
Latino	4%
Other	1%
Ages %	
14.5	10%
15	18%
16	42%
17	30%

The Apsche et al. (2011) meta-analysis established MDT as an empirically supported methodology for their target population of adolescent males from 14 thru 17 years of age. The contribution of this article also evaluated the power of a replication study by Murphy and Siv (2010) as independently supporting the contention by Apsche et al. (2011) and others (Thoder & Cautilli, 2010) that MDT offers an effective empirically based methodology for adolescents within the target population for the MDT vs. Relapse Prevention - CBT meta-analysis review. The Apsche et al. (2011) meta-analysis study delineates that MDT is more effective than basic CBT with physically, sexually, and verbally aggressive male adolescents from 14.5-17. The questions arise such as why is MDT a more effective treatment than CBT? Which specific variables are effective in MDT and how do they work? This study is an attempt to answer those questions. The part of MDT that separates it from other contextual treatments is the validation, clarification, and redirection (VCR) methodology, which is central and unique to MDT. Similar to the intent of Zettle, Rains, and Hayes (2011) who addressed the mechanisms of change between ACT and CBT, this article addresses the mechanism of change specific to MDT only. At a later date the authors plan to address the mechanisms of change in MDT that are similar to ACT and DBT, including mindfulness, acceptance, and defusion. The concept is that MDT and CBT are

similar in some aspects, particularly case conceptualization, yet there are differences in the specific methodologies and mechanisms of changes. In the Zettle et al. (2011) analysis of mechanisms of change of ACT as compared to Cognitive Therapy, the authors suggest that ACT decreases depression and depressive thoughts more than CBT. The focus of Zettle et al. (2011) was on the specific process differences. Basically the authors suggest that ACT does produce cognitive and emotional change through the process of acceptance, defusion, mindfulness, and values.

### Method

This was a random treatment research study comparing MDT and CBT in a community outpatient setting and a residential treatment facility. Data were collected at pre-treatment, six months, twelve months and one year post discharge. Families were defined as the pre and/or post treatment place of residence for the adolescents. Table 1 describes participant characteristics.

### Participant Recruitment and Retention

Inclusion criteria were:

- specific problems with aggression, conduct, and opposition;
- a family or caregiver with whom the adolescent resided;
- adolescent males ages from 14 to 18 years;
- fluent in English; and
- functioning within the “normal range” of intelligence and no active psychotic symptoms.

All families, caregivers, adolescents, and referring agencies were involved with the random selection process and all gave informed consent. All youths were randomly assigned to either MDT or CBT and were informed by sealed envelope and explanation letter identifying the group to which the youth was assigned.

An assignment process was implemented (McEntegart, 2003) to attempt to avoid chance imbalances on major characteristics of the adolescents (For example, exclusionary criteria were excessive violence or current psychosis). No children or families assigned were able to withdraw or “drop out” by court or Department of Youth and Family Services (DYFS) mandate. Unlike many studies the populations were not totally homogeneous in that all individual references were mandated to receive treatment.

### Assessment of specific outcomes

Two outcomes were examined

- adolescents completed the STAXI-II a 44 item self-report measures on anger and aggressive behavior and
- the Behavior Ratings Scale was a simple frequency and duration reported data card recorded by staff. Supervisors did 3 one hour behavior reliability checks per day for inter rating reliability.

The inter rater reliability was .95% for the entire study in both MDT and CBT conditions. Both groups used relapse prevention (R-P) and had the same level of therapists, supervisors, and training.

### Participation

There were 84 male participants, ages 14 to 17. All were referred by the Department of Children and Youth services and the Department of Juvenile Justice. Participants were referred from 4 cities along the Eastern United States, for aggression, opposition, and disruptive behaviors. There were numerous adolescents with co-occurring aggressive disorders and psychiatric Axis I disorders. (See demographics). The most frequent co-occurring disorder was PTSD, comprising 62% of the participants.

Each participant was referred to either condition, MDT or CBT. This random assignment was completed by the referral source and neither the MDT nor CBT had any control in the selection process as to whom they would receive for treatment. The residential assignments were completed by the referral sources as well. They were random in nature and they were referred to several different providers. The agencies had a “no reject-no eject” policy, therefore there was no pre-selecting individuals by any of the agencies.

Because of the nature of the referrals and the requirements of the participants, all individuals and their families were considered “sent” clients. All participants were informed of the outcomes data collection process and guaranteed anonymity as all HIPAA regulations were ensured and properly observed. All families and adolescents agreed and signed informed consent forms.

### Treatment Research Conditions

Participants were either adjudicated or mandated for treatment by their particular division of youth services and/or on probation. All were mandated by courts in their particular jurisdiction to receive treatment.

### Treatment Fidelity of MDT

MDT has specific methodologies to ensure compliance to the model. Methodologies include; the MDT compliance checklist, the clinical review of the case conceptualization and adherence to the FMDT assessment guidelines in the MDT Clinicians Manual (Apsche, 2009). The other measure of fidelity is the direct observation of sessions and MDT checklists completed by MDT supervisors. All aspects of the MDT treatment were under the supervision of an MDT trainer doctoral level psychologist.

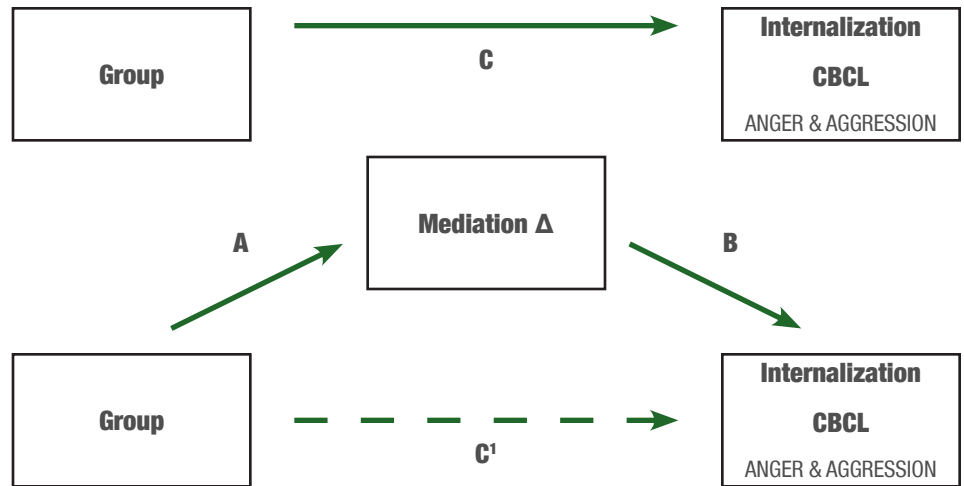
### Treatment Fidelity of CBT

The treatment fidelity of CBT was ensured by a doctoral level Psychologist who was trained and well versed in Relapse Prevention CBT. There was a group of supervisors who did direct observation

of CBT to assure reliability and fidelity to the model. CBT was chosen to compare to MDT because it was the methodology commonly used by both residential and outpatient providers in the area. MDT was compared to a commonly accepted methodology that had been purported to be successful by local clinicians.

**Strait Trait Anger Expression Inventory (STAXI-II)**

The STAXI-II was developed with two goals in mind (Spielberger, 1999). The first was to develop a measure of the components of anger in the context of both normal and abnormal personality. The second goal seems more specific to a particular research orientation, in this case examining the contribution of anger to the development or exacerbation of medical conditions such as hypertension, coronary heart disease, and cancer. As the name implies there are two fundamental aspects of anger, which are addressed: the experience of anger and the expression of anger. The experience of anger can be understood in the context of state- subjective feelings that vary from irritability to intense rage, and trait anger which refers to perceiving situations as annoying and to responding to these situations by more frequent expressions of state anger. Thus state and trait anger are unlikely to actually be independent characteristics or components of anger. When expressing anger, it may be focused outward on other people or objects (Anger-Out), or directed inward (Anger-In). A third component is the degree to which people attempt to control their expression of anger (Anger Control). The STAXI-II is designed to assess people age 13 through adulthood with a minimum fifth grade reading level. The task of administering the test is straightforward, essentially self-administered; however, interpretation of test scores requires formal training in assessment. There are no time limits imposed in completing the STAXI-II; however, it is a brief test and most people complete it within 15 minutes. The STAXI-II was chosen as mediation



**Figure 1.** Path model of mediated intervention effects. Dotted lines indicate that the mediation variable was controlled for  $\Delta =$  change.

because of the relationship developed in the scales from anger to aggression.

**Child Behavior Checklist (CBCL)**

The Child Behavior Checklist, (Achenbach, 1991) is a parent-report questionnaire on which the child was rated on various behavioral and emotional problems. It was first developed by Thomas M. Achenbach and has been one of the most widely-used standardized measures in child psychology for evaluating maladaptive behavioral and emotional problems in preschool subjects aged 2 to 3 or in subjects between the ages of 4 and 18. It assessed internalizing (i.e., anxious, depressive, and over controlled) and externalizing (i.e., aggressive, hyperactive, noncompliant, and under controlled) behaviors. Several subareas were measured including social withdrawal, somatic complaints, anxiety and depression, destructive behavior, social problems, thought problems, attention problems, aggressive behaviors, and delinquent behaviors. Both versions

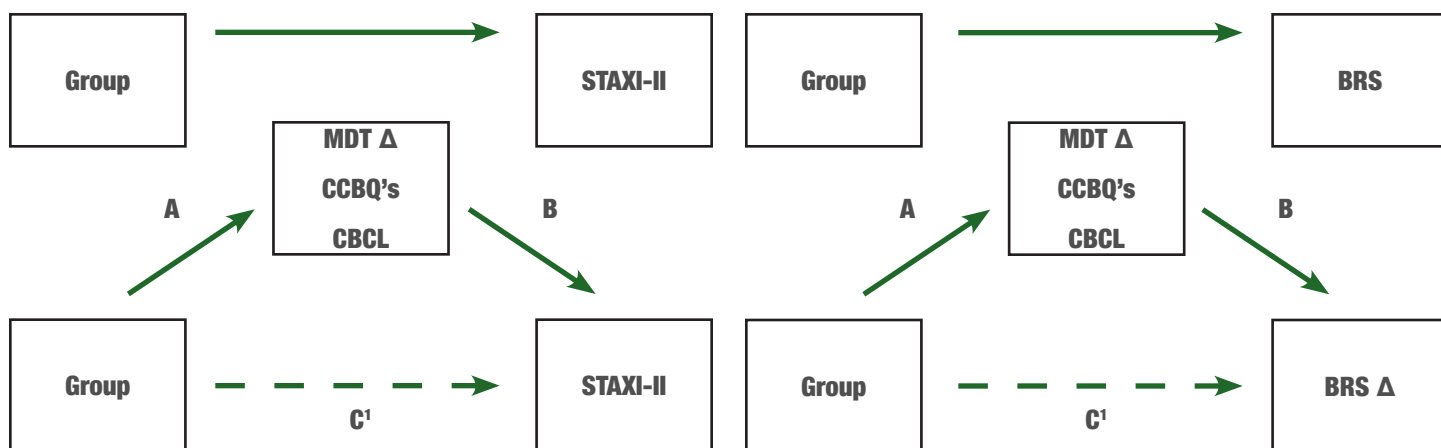
of this checklist were used—the one designed for 2 to 3 year olds and the other for 4 to 18 year olds.

**Compound Core Belief Questionnaire (CCBQ)**

CCBQ's (Apsche & DiMeo, in press) identifies the presence of the following eight types of beliefs in the adolescent: Antisocial personality Beliefs, Avoidant Personality Beliefs, Borderline Personality Beliefs, Conduct Beliefs, Dependent Personality Beliefs, Histrionic Personality Beliefs, Narcissistic Personality Beliefs, and Obsessive Compulsive Beliefs. These 8 types of beliefs correlate with specific personality traits and behaviors characteristic of angry, aggressive, and oppositional adolescents. They usually present as clusters of more than one belief and provide a profile of the adolescent, as well as a blueprint for MDT treatment. The following is a brief explanation of each belief: Antisocial Personality Beliefs are related or congruent with an antisocial lifestyle, Avoidant Personality Beliefs are related to the avoidance of participating in life in general and in particular activities such as school,

**Table 2.** Intake-Post Treatment Difference

Variable	Intake				Post treatment				Intake-Post treatment Difference				
	MDT		CBT		MDT		CBT		MDT		CBT		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
STAXI-II													
Anger In	.91	45	5.5	47.8	3.70	31.8	5.35	45.43	7.48	16.7	5.35	2.37	7.71
Anger Out	.90	50.1	12.9	49.5	4.63	31.91	7.15	46.11	10.81	18.21	10.87	3.41	9.89
AE	91.5	52	13.4	50	3.17	35.4	4.34	47.33	11.31	16.83	7.33	2.74	12.49
Behavior Rating Scale	89	34.7	12.4	25.34	8.79	.1	3.35	22.3	7.34	-34.6	4.33	-3.01	.14
Frequency Duration	.91	12.2	8.9	10.1	12.89	.11	4.71	9.75	8.31	-11.2	.47	-.35	.51
CCBQ-S	.93	136.2	36	131.7	34.3	108.96	74.1	139.7	27.22	27.24	11.0	3	7.08
CBCL INT	.91	48	3.33	47	5.70	30	4.34	44	6.15	-18	5.12	-3	5.71
CBCL EXT		50	3.71	49	5.91	32	5.67	46	7.7	-18	7.34	-3	.11
TOTAL		49	5.15	48	4.14	31	4.14	49	8.65	-18	4.33	-3	5.13



**Figure 2.** Path models of mediated intervention effort with anger (Straight Trait Anger Expression Inventory) STAXI-II and aggression (Behavior Rating Scale) BRS. Dotted lines indicate that the mediation variable was controlled for  $\Delta$  = change, ( $PC.001$ ,  $PC.001$ ). This finding indicates evidence for mediation by MDT using both the STAXI-II and the BRS as anger and aggression outcome measures.

social, recreations, etc., and Borderline Personality Beliefs are related to concurrent dichotomous beliefs. These beliefs convey an inability to establish a sense of self and/or reflect a dysregulation in mood and interpersonal relationships. Conduct Beliefs are related to problem and delinquent behaviors and Dependent Personality Beliefs are related to a pattern of dependence in the adolescent.

### STAXI-II Scales

The STAXI-II consists of 44 items which are distributed across five main scales. Consistent with the conceptualization of anger described above, there are three main aspects to the STAXI-II scales: State, Trait, and Anger Expression. State is the first item assessed, which measures the intensity of anger. Trait contains two subscales that examine different dispositions in trait anger- temperament and reaction. Anger Expression is an experimental composite of the three expression constructs- In, Out, and Control.

### Outcome Measures

The outcome measures employed in this study include those employed in previous FMDT studies (Apsche, Bass, Zeiter, & Houston, 2009). Utilizing the CBCL, the means and standard deviations derive from three divided categories: Internalizing (which measure withdrawn behaviors, somatic complaints, anxiety and depression), externalizing (which measure delinquent behavior and aggressive behavior), and total problems (which represent the conglomerate of total problems and symptoms, both internal and external).

### Analytic Strategy

Treatment effects were assessed using the Baron and Kenny (1986) mediation steps criteria and were averaged as shown in Figure 1. Evidence of Mediation was evaluated using the formulation derived by MacKinnon, Lockwood, Hoffman, West, and Sheet (2002) that compares the statistical differences between Paths C and C1 with a null value

of zero. These results directly test the null hypotheses that Path C is not different from Path C1. Because C minus C1 represents the amount of mediation; the rejection of the null hypothesis supports the existence of mediated treatment intervention effects. M plus (Muthen & Muthen, 2001) was implemented with the path models for its flexibility in the actual estimation of missing data with maximum likelihood alpha was set at .05.

### Measures of Prepared Mediators of Treatment Effect

There is a rich and extensive body of research on adolescent treatments. MDT is the only evidenced based treatment for anti-social youth that has examined mediators of outcomes with this population. This study examines adolescent males ages 14.5 through 18 with co-occurring disorders of conduct, aggression, personality symptoms, and mental health disorders, and the specific mediators on the outcomes for these youth.

### Anger

Scales from the Straight -Trait Anger Expression Inventory (STAXI-II) were used to evaluate the mediation of MDT on anger and internalizing disorders as measured by the CBCL.

## ■ Results

### Mediation from Treatment Group to Anger and Aggression (Path C)

As Table 2 illustrates, MDT demonstrated greater reduction from intake to post treatment in the STAXI-II, CCBQ'S and behavior tracking sheets than Cognitive Behavior Therapy. It also contains the means and standard deviation of both groups at intake and post treatment, as well as the change scores, with the respective standard deviations.

### Meditational Requirements from Treatment Group to Potential Mediators (Path A)

Participants in the MDT condition improved significantly more than the participants in the CBT

condition from intake to post treatment on every measure of the study. The MDT group improved on each of the seven measures including, CBCL, internal, external and total scores, STAXI-II anger in, anger out and total score, and the CCBQ's. The specific interest was how the CBCL internalizing score was reduced significantly as the related externalizing anger scores on the STAXI-II anger out was reduced and uncommonly the associated attenuation in the path to the reduction of these concomitant scores were statistically significant at the  $p = .001$  level on the mediation statistical analysis (see Figure 1).

### Meditational Requirement: From Mediation to Anger and Aggression (Path B)

The aggression scores were measured by behavior rating scales. They were designed to record each event of aggression with inter-rater reliability. The total aggression score decreased significantly. The anger scores were measured by the STAXI-II and were significantly regressed on one specific change score, specifically the VCR-FAB in the MDT (CCBQS) group.

### Mediation Requirement 4: Attenuation Path C (Path C)

The final test of mediation involved in the regression analysis of changes in the anger and aggression scores for both the MDT and the CBT scores assesses whether the path between the MDT group and the anger and aggression changes were significantly attenuated statistically after accounts for changes the mediator. Figure 1 summarizes the path model of mediated intervention effects. C1: MDT (CCBQ's) and the STAXI-II change was regressed on the treatment group variable and resulted in the full mediator  $C2 = p.001$ , which indicated that the differences between C and C1 were significant. As seen in Figure 1 and Figure 2 the MDT score slope had a strong impact on the STAXI-II and behavior data scope ( $p.001$ ,  $B = 71$ ), whereas the treatment

group anger and aggression score pattern attenuated and was no longer significant ( $p = .200$ ).

### C1 MDT with Behavior Data for Aggression.

When aggression was measured with the Behavior Rating Scale the same pattern held, the magnitude increased, and the effect was longer. As seen in Figures 1 and 2, the path from treatment group to the BRS slope ( $B = .75$ ) was significant ( $PL.001$ ). The relationship between the MDT (CCBQS) slope had a strong impact on the STAXI-III slope ( $p < .001$ ,  $B = .75$ ), whereas the CBT (CCBQS) group STAXI II path attenuated and was not significant ( $p = .5$  if  $B = .06$ ).

C1 MDT (CCBQ's) and BRS, when aggression was measured with the BRS and similar patterns, showed the magnitude of the effect was statistically significant.

As seen in Figure 2, the path from the treatment group to the BRS slope ( $B = .76$ ) was significant ( $p = .001$ ) and the relationship between MDT and the BRS slope remained strong ( $B = .75$ ), and significant ( $p = .001$ ). The test of C versus C1 differing from zero was also a significant effect ( $z = 3.1$ ,  $p = .001$ ).

C1 MDT and the CCBQ's was regressed by the treatment group variable and resulted in fill mediation effects ( $B = .71$ ,  $p = .001$ ), which suggests that the reduction of the CCBQ-S scores might affect the increase and decrease in anger and aggression.

## ■ Discussion

The purpose of this study was to examine the specific components of MDT, which we feel create the results of it being an effective treatment for anger and aggression in adolescent males. With a deeper examination of MDT, we examined multi-factored specific therapeutic factors in a clinically representative sample of adolescents with combined anxiety and oppositional defiant disorder. A key component of MDT, the validation, clarification and redirection (VCR), was a consistent factor in the treatment of anger and aggression.

We found evidence for mediation by MDT using both the STAXI-II and the BRS as anger and aggression outcome measures. Accounting for the change in the MDT scores, the effect of the MDT condition were reduced by 8 times with the STAXI-II from a difference of 16.7 versus 2.35 and approximately new mean of -34.6 versus 3.61 for the Behavior Rating Scale (BRS). These reductions were significant for both the STAXI-II and the BRS scores. It appears that both anger and aggression are mediated by the MDT, VCR-FAB.

The reduction of the personality beliefs by the MDT group is significant in that it suggests that there is an association between these beliefs and anger and aggression/MDT and the Compound Core Belief Questionnaire-Short (CCBQ-S) slope remained strong ( $B = .71$ ,  $p < .001$ ) indicating that these beliefs have a strong relationship with anger and aggression and are mediated by MDT. We also

found that the externalizing score on the CBCL has a direct relationship to the mediator and relates to the STAXI-II anger out scores of 1.73 ( $p < .001$ ).

The present study has several strengths. First, MDT was shown to reduce symptoms of aggression and maladaptive personality beliefs. This finding strengthens the empirical validation of MDT as a treatment for these beliefs and actions. It also implicitly suggests that these personality beliefs may be involved and perhaps activate anger and aggression in adolescents. If both MDT and Treatment As Usual (TAU) were equally effective in reducing anger and aggression, the first step of the mediation goal would have been treatment method and the analysis would have stopped there. If we had not used a treatment control, we could not have justified our examination of the mediated effects of MDT. Because we utilized the TAU as control, the results of this study supports our contention that MDT has an impact on anger and aggression through mechanisms that are specific to MDT treatment, as opposed to non-specific factors affecting treatment.

Another strength is that this study has aspects of both efficacy and effectiveness research (Nathan, Stuart, & Dolan, 2000; Kaufman, Rohde, Seeby, Clarke, & Stile, 2005) with a robust clinically representative population sample. Because of this, the sample can potentially enhance the external validity of this study. Also important is the clarity of the MDT and CBT group and clear measures of mediation and outcomes affords the opportunity for independent replication.

There are several limitations of this study that must be noted. First, the study was completed by the founder of MDT and his research team. This is important to note because the first author has a vested interest in the success of the study. However, all the guidelines of mediation analysis and multiple regression research were followed in an honest and ethical manner to the best of our abilities. Second, the mediators were measured only at intake and post treatment, simultaneous to measurements of anger and aggression outcome. Thus, there might have been increases, decreases, or fluctuations in the measures that would be important for replication of future research in MDT.

Our design could not detect interior changes or reflect specific effects of anger or aggression throughout the study (Hollon, DeRubeis, & Evans, 1987) and internalizing issues as measured by the CBCL. In future studies, we recommend measuring mediation for anger and aggression outcomes repeatedly across time to provide for the generation of growth curves, which then could be compared and analyzed with each other within a model, similar to Henggeler et. al (2010) or compare the results in a latent growth model (Cole & Maxwell, 2003).

Another limitation is our sample as they consisted of adolescent males who were "sent" or were directed to receive treatment. This artifact creates a potential threat to internal validity. This also pos-

tulates a question as to what results a sample of adolescents who would seek treatment might produce. At the same time, this is strength in that study participants present a larger challenge by not volunteering for treatment, rather they are mandated.

Another limitation may be the limited sample size. Larger groups for both conditions might investigate MDT more thoroughly. In the future, it would be beneficial to engage a larger sample size to evaluate the mediation of MDT and increase the certainty of the findings. Despite these limitations, significant efforts were put into this study in identifying supportive agencies and county officials. These efforts sought to increase the objectivity of the measures while also increasing the variability of the subject population. By exhibiting the effective face of MDT in these sectors, we hope to increase referral and thus sample size for future studies.

There have been numerous studies which support the efficacy of MDT as an evidenced based treatment for oppositional, aggressive, angry, and conduct disordered youth (Apsche & DiMeo, in press; Apsche, J.A., & Bass, C.K., 2006; Murphy, C.J., & Siv A.M., 2010).

This study suggested that MDT is effective because of the mediated effects of VCR-FAB on this above mentioned populations of adolescents. It is imperative to attempt to understand the reasons why contextual and other CBT treatments work. These results will affect the therapeutic constructs of current and future treatments of a specific orientation. These results will also affect the pragmatic development of future specific MDT treatment for many disorders in adolescent males, by clarification the VCR as a mediator of outcome. There are many refinements to MDT that may develop from these results and future articles examining specific mediators of MDT and other methodologies for treatment of an array of disorders.

Clear and concise mediation and the studies of such hopefully will encourage replication or additional studies of MDT and other contextual treatments for adolescents. Our sincere hope is that this study improves research and treatment and contributes to what we know and understand about the treatment of this typology of adolescent males. One of the greatest challenges to creation and implementation of a theory is dissecting the components which make it effective. The VCR technique within MDT serves as an important piece in this regard. The other challenge is understanding the process of change. To this, we look to Kazdin (2007) who has established six criteria for demonstration mediators of change.

Kazdin's (2007) first criterion is that significant associations must be established between the specific therapeutic intervention and the hypothesized mediation and the outcome measures as well. These associations are reviewed and discussed extensively under mediators section with results section.

The second point that Kazdin suggests is that a demonstration of specificity is useful when the

purported therapeutic changes are accompanied by a limited number of constructs rather than by a multitude of possible constructs. There were several parts of MDT that were not identified as mediators in this study (i.e. mindfulness, cognitive and b emotional diffusion, and acceptance). Many of these potential mediators are also accounted for in other contextual therapies, (i.e. Acceptance, Mindfulness, ACT, DBT). The four examine the variables that are only MDT variables (VCR-FAB).

The third Kazdin (2007) criterion for mediation analysis is the consistency of replication results across studies, conditions, and samples that conditions contribute to inferences about specific mediation. This study is in line with other contextual studies (Levin, Hildepland, Lillis, & Hayer, 2011) that evaluate mediators and components of ACT. However, since MDT is the only methodology that implements the VCR-FAB methodology, MDT stands alone investigating this specific mediation and that is the rationale in choosing the specific mediators to evaluate with VCR.

Kazdin's (2007) fourth criterion is that the timeline of the causal relationship needs to be established. The specific and temporal relationship between VCR-FAB (CCBQS) and the reduction of anger (STAXI-II) and aggression (BRS) was relatively consistent with Kazdin's (2007) last criteria. There is an extraordinarily difficult criterion to reach; however, examining the CBCL and the other multiple faceted measures addressed this criterion, in this case of treatment research, this specific part of the study reached Kazdin's (2007) fourth criterion.

Kazdin's (2007) fifth criterion for mediation effectiveness is that it demonstrates a gradient where by increased activation of the purported mediation is directly associated with greater change in the outcome. This study's approach appears to have reached criteria. The direct test of the results of the MDT variable in this study is involved in a direct test of relation between the desired change and the reduction of the CCBQS, defined by the greater variables and the mean and SD of each variable.

Kazdin's (2007) sixth criterion suggests examining how the plausibility and coherence of the way in which a mechanism operates and fits into the broader scope and findings of the literature and specifically contributes to inferences regarding the mediators. There appears to be a clear relationship between the implementation of the MDT methodological variable, VCR-FAB, and the reduction of internalizing disorder and anger and aggression. These specific results need to be independently replicated although they supported other MDT research.

### Clinical Implications

Having met Kazdin's (2007) criteria, this study suggests that MDT has an effect on the reductions of anger and aggression in adolescent males between the ages 14-18, where there also seems to be a relationship between the skillful application of

the VCR-FAB and specific variables of anger and aggression. Apsche et al. (2011) have demonstrated the overall effectiveness of MDT as compared to CBT in reducing a variety of variables of both externalizing and internalizing disorders. This research focuses on why some of the mediators of change that take place in MDT as a contextual behavioral treatment. In addition to larger sample size, future research might also include a focus on the reduction of anxiety and depression as a partner of MDT.

The internal consistency is based on the Radner-Richardson Coefficient of Reliability. MDT is measured by the CCBQ. As the retention is a strength in life and treatment interference belief were shown to be significant and related to the VCR-FAB Mindfulness as a methodology.

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