FAMILY COMMUNICATION AND TREATMENT BENEFIT IN A
COMPARATIVE EFFICACY TRIAL FOR DEPRESSED AND SUICIDAL
ADOLESCENTS

by

Abigail Zisk

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Abigail Zisk

Approved:

R. Rogers Kobak, Ph.D.
Professor in charge of thesis on behalf of the Advisory Committee

Approved:

Robert F. Simons, Ph.D.
Chairperson of the Department of Psychological and Brain Sciences

Approved:

George H. Watson, Ph.D.
Dean of the College of Arts and Sciences

Approved:

Ann L. Ardis, Ph.D.
Senior Vice Provost for Graduate and Professional Education
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ABSTRACT

Although parent and adolescent reports of the family environment have been found to moderate depressed and suicidal adolescents’ response to treatment, much less is known about how observations of family interactions moderate treatment response. The current study examined baseline parent-adolescent communication using the Goal-Corrected Partnership in Adolescence Coding System (GPACS; Lyons-Ruth, Hennighausen, & Holmes, 2005) along with parent and adolescent reports of family environment. These pre-treatment family variables were tested as potential moderators of treatment response in a comparative efficacy trial of Attachment-Based Family Therapy (ABFT) and Family-Enhanced Non-Directive Supportive Therapy (FE-NST). One hundred and twenty-nine adolescents (82.9% female) were randomized to the two sixteen-week treatments. Adolescents who engaged in less cooperative and validating interactions with their parents reported greater reductions in depressive symptoms than adolescents who engaged in more cooperative and validating interactions with their parents. Rates of change in depressive symptoms were not moderated by treatment condition or by parent and adolescent reports of family conflict and cohesion. Implications for using observational assessments to identify adolescents most likely to benefit from ABFT and FE-NST are discussed.
Chapter 1

INTRODUCTION

The past several decades have witnessed the development of several promising treatments for depressed and suicidal adolescents (for review, see Curry, 2014; Glenn, Franklin, & Nock, 2015). Although these treatments have been identified as “probably efficacious,” depressed and suicidal adolescents show substantial variability in the extent to which they benefit from these treatments. These individual differences in treatment response point to the need to identify baseline variables or prognostic indicators that predict variation in treatment response regardless of treatment condition as well as prescriptive factors that predict differential response to specific treatment modalities, thereby informing a more personalized approach to treatment planning (DeRubeis et al., 2014; Ng & Weisz, 2016). The current study was designed to assess variability in family support as a potential moderator of adolescents’ treatment response in a comparative efficacy trial in which adolescents received either Attachment-Based Family Therapy (ABFT; Diamond et al., 2010) or Family-Enhanced Non-Directive Supportive Therapy (FE-NST; Levy & Diamond, 2010). Both treatments aimed to increase adolescents’ access to adult support as a means of reducing suicidal and depressive symptoms. Family support was assessed pre-treatment with self-report measures of family conflict and cohesion as well as with an observational measure of cooperative communication during a 10-minute problem-solving discussion between the parent and adolescent. These multiple indicators of family support were tested as moderators of adolescents’ response to ABFT and FE-NST.


1.1 Lack of Family Support and Risk for Adolescent Depression and Suicidality

An extensive literature has examined parent and adolescent reports of family environment as a factor that increases risk for adolescent depression and suicidality. Potential barriers to family support, including high levels of family conflict, have been implicated in adolescents’ suicidal behaviors (Borges et al., 2010; Bridge, Goldstein, & Brent, 2006; Wagner, Silverman, & Martin, 2003) and suicidal ideation (Miller, McCullough, & Johnson, 2012; Prinstein, Boergers, Spirito, Little, & Grapentine, 2000). Alternatively, positive indicators of family support such as cohesion and connectedness have been shown to reduce adolescents’ risk for suicidal ideation and behavior (Borowsky, Ireland, & Resnick, 2001; Conner et al., 2016; Logan, Crosby, & Hamburger, 2011; Matlin, Molock, & Tebes, 2011). The role of supportive family environments has also been evident in studies of adolescent depression, which link lower levels of parental support and higher levels of family conflict to increased risk for adolescents’ depressive symptoms (Kelly et al., 2016; Restifo & Bögels, 2009; Sallinen, Rönkä, Kinnunen, & Kokko, 2007; Sheeber, Davis, Leve, Hops, & Tildesley, 2007).

Although lack of family support increases adolescents’ risk for suicidal and depressive symptoms, not all suicidal and depressed adolescents lack access to supportive family environments. Depressed and suicidal adolescents who report supportive family environments may attribute their symptoms to a variety of non-familial factors. For instance, Bridge et al. (2006) conceptualize the onset of suicidality in youth within the context of a developmental trajectory that incorporates genetic, psychiatric, neurobiological, and environmental risk factors. Similarly, a constellation of risk factors, including maladaptive cognitions, ineffective coping strategies, and parental psychopathology, has been shown to increase the likelihood of depression in adolescence (Gladstone, Beardslee, & O’Connor, 2011). When considering suicide risk
among depressed adolescents, behaviors such as non-suicidal self-injury have been found to significantly predict future suicidal behavior (Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011). Given these multiple risks for adolescent symptomatology, the role of family support is likely to vary among depressed and suicidal adolescents.

1.2 Family Support as a Moderator of Adolescent Treatment Response

In addition to contributing to risk for depression and suicidality, family support has also been shown to moderate adolescents’ treatment response. The initial studies that examined family support as a moderator of treatment benefit produced mixed findings. On the one hand, several studies reported that adolescents from more supportive families showed better treatment response. For instance, family cohesion predicted faster recovery rates for depressed adolescents receiving cognitive-behavioral therapy (CBT) or life-skills tutoring (Rohde, Seeley, Kaufman, Clarke, & Stice, 2006). Additionally, family conflict was linked to treatment non-response among depressed adolescents receiving CBT and/or pharmacological treatments (Asarnow et al., 2009; Feeny et al., 2009; Rengasamy et al., 2013) and to post-treatment recurrence of depression among adolescents receiving CBT, systemic behavioral family therapy, or non-directive supportive therapy (NST; Birmaher et al., 2000). Family conflict and impaired family functioning have also been shown to predict suicidal events among depressed adolescents both during (Brent et al., 2009) and following treatment (Wilkinson et al., 2011). On the other hand, a study that compared interpersonal psychotherapy-adolescent skills training (IPT-AST) to school counseling found that adolescents reporting more baseline conflict with their mothers had more reductions in
depressive symptoms in IPT-AST than in school counseling (Young, Gallop, & Mufson, 2009).

Surprisingly, few, if any, studies have systematically considered treatment modality when evaluating family support variables as moderators of treatment response. This is surprising given that treatments vary in the extent to which they specifically target family support. For instance, while enhancing parental or adult support has been identified as an active ingredient of effective treatment for suicidal adolescents (Brent et al., 2013), most studies of family support as a treatment moderator have been limited to treatments that primarily target adolescent skill development, particularly CBT (Asarnow et al., 2009; Brent et al., 2009; Feeny et al., 2009; Rengasamy et al., 2013; Rohde et al., 2006; Wilkinson et al., 2011). As a result, much less is known about family support as a moderator of treatment response in interventions that are specifically designed to enhance the adolescent’s access to a supportive and validating relationship with a parent or therapist. Furthermore, investigations of family support variables as moderators of treatment response have exclusively relied on adolescent or parent reports of family environment. As a result, findings from these studies are limited by methodological concerns such as social desirability and results that are attributable to common-method variance (Kazdin, 2003).

Accordingly, there is a need to address these two limitations of previous studies. First, family support as a moderator of treatment response should be examined in treatments that primarily aim to enhance adolescents’ access to supportive and validating relationships with parents or adults. Both ABFT and FE-NST allow for this examination. Founded in attachment theory (Bowlby, 1969/1982, 1973), ABFT assumes that ruptures in the caregiver-adolescent relationship contribute to and maintain
adolescent depressive and suicidal symptoms. Consequently, increasing the adolescent’s communication with the parent is a primary target in ABFT (Diamond, Russon, & Levy, 2016; Kobak, Zajac, Herres, & Ewing, 2015). FE-NST also seeks to enhance the adolescent’s access to a supportive and validating relationship, which, in this case, is primarily the therapist. This treatment is based on NST (Brent & Kolko, 1991) and focuses on the therapist’s communication skills (e.g., reflective and empathic listening, encouragement, and rapport-building) to support adolescents as they articulate and process distressing thoughts or upsetting feelings (Brent et al., 1997). FE-NST enhances the NST treatment by incorporating parent psychoeducation. As a result, both ABFT and FE-NST specifically target the adolescent’s access to a supportive and validating parent or therapist as a primary active ingredient in reducing adolescents’ depressive and suicidal symptoms.

A second limitation of prior studies has been the exclusive reliance on adolescent or parent reports of family environment. Although observational assessments of parent-adolescent communication have consistently been linked to the quality of the current parent-adolescent relationship in developmental (Allen & Tan, 2016) and risk studies (Chaplin et al., 2012), observational assessments have been surprisingly absent from treatment studies. In contrast to self-report measures for family climate, observational ratings of parent-adolescent communication provide an opportunity to more closely assess the degree to which the adolescent is able to maintain connectedness and a sense of being cared for and validated by his or her parent.
1.3 The Current Study

The current study had two primary aims. First, we sought to evaluate an observational assessment of pre-treatment parent-adolescent communication as a moderator of treatment benefit. Second, we tested this observational measure, as well as more commonly used parent and adolescent reports of family environment, as a moderator of depressed and suicidal adolescents’ response to ABFT and FE-NST. Given the treatment targets of these two interventions, we anticipated that adolescents who engaged in less cooperative and validating interactions with their parents during a discussion of a goal conflict would be more likely to benefit from either ABFT or FE-NST. Additionally, we expected that treatment condition would moderate the effect of family communication on adolescents’ treatment response. More specifically, we predicted that adolescents with less cooperative, supportive, and validating interactions with their parents would be more likely to benefit from ABFT’s specific focus on repairing and strengthening the parent-adolescent attachment bond than from FE-NST’s emphasis on the development of a supportive relationship between the adolescent and the therapist.
Chapter 2

METHOD

2.1 Participants

Participants were recruited from emergency rooms, inpatient psychiatric hospitals, primary care and outpatient mental health facilities, schools, and self-referrals. A total of 253 adolescents were screened for eligibility. Inclusion criteria required severe suicidal ideation, as indicated by a score greater than or equal to 31 on the Suicidal Ideation Questionnaire-Junior (SIQ-JR; Reynolds, 1988), and at least moderate depression, as indicated by a score greater than or equal to 20 on the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). An adult primary caregiver was also required to participate in assessments and treatment. Adolescents and their caregivers were excluded if a) the adolescent was determined to be at imminent risk of harm to him/herself or others and therefore deemed unsafe to treat within an outpatient setting, b) the adolescent endorsed or demonstrated psychotic symptoms, c) the adolescent displayed severe impairment in cognitive functioning, d) the participating caregiver was a non-English speaker, or e) the adolescent had started an anti-depressant medication within three weeks of the initial assessment.

A total of 129 adolescents were deemed eligible and agreed to participate in the study. Participants were between the ages of 12 and 18 ($M = 14.96$, $SD = 1.66$), with females representing 82.9% ($n = 107$) of the sample. More than half (55.8%, $n = 72$) of the adolescents identified as Black/African American, 31% ($n = 40$) as White/Caucasian, 6.2% ($n = 8$) as American Indian or Alaskan Native, 2.3% ($n = 3$) as
Asian, and 0.8% \((n = 1)\) as Native Hawaiian or Other Pacific Islander, with 12.4% \((n = 16)\) identifying as “other.” Sixteen percent \((n = 20)\) of the adolescents reported being Hispanic/Latino, and 68.2% \((n = 88)\) identified as heterosexual. Caregivers indicated that 42.6% \((n = 55)\) of the adolescents lived in two-parent households, 45% \((n = 58)\) lived in single-parent households, 7% \((n = 9)\) lived with a parent and that parent’s partner, and 5.4% \((n = 7)\) lived with non-parental caregivers (e.g., grandparents). Thirty-one percent \((n = 40)\) of the sample had an income-to-needs ratio equal to or less than 1.0, indicating households living below the poverty line.

2.2 Procedure

This study was approved by the Institutional Review Boards of the universities involved in study implementation. All participating adolescents were consented or assented along with an adult caregiver. During a baseline assessment, adolescents and their caregivers completed a battery of interviews, self-report measures, and a 10-minute parent-adolescent conflict discussion. For this conflict discussion, dyads were instructed to engage in conversation about a topic identified by the parent and adolescent as a current source of disagreement in the relationship. These discussions were videotaped and sent to independent raters for coding. Coders participated in a training process that included attending a GPACS training workshop and rating a series of test videos. Once a high level of reliability was achieved, coders had regular check-ins with a GPACS trainer to avoid any drift in ratings. All coders were blind to treatment condition and to all other study measures.

Following the baseline assessment, families were randomly assigned to ABFT or FE-NST. Adolescents in both treatment conditions received 16 weeks of treatment. Repeated assessments of outcome measures, including the BDI-II and SIQ-JR, were
completed monthly at weeks 0 (baseline), 4, 8, 12, and 16 (post-treatment). The baseline and repeated assessments were administered by study staff who were blind to treatment condition.

2.3 Treatments

**Attachment-Based Family Therapy (ABFT):** ABFT (Diamond et al., 2010) is a 16-week, manualized treatment that has demonstrated efficacy in treating suicidal and depressed adolescents (Glenn et al., 2015). With a primary goal of enhancing the adolescent’s sense of parental availability and security, ABFT is comprised of five tasks (Ewing, Diamond, & Levy, 2015): the Relational Reframe, the Adolescent Alliance Task, the Parent Alliance Task, the Repairing Attachment Task, and the Autonomy Promoting Task. At the beginning of treatment, the therapist works with the parent and adolescent to shift the family’s understanding of the adolescent’s current difficulties, removing blame from the adolescent as the sole problem and moving toward a conceptualization of the parent-adolescent relationship as a critical component of the solution. In individual sessions, the adolescent identifies ruptures within the parent-adolescent relationship that may have precipitated or that may be perpetuating the adolescent’s symptomatology, while parents explore how their own relational history and experience of current stressors may be interfering with their caregiving capabilities. In joint sessions, the therapist coaches the parent and adolescent through corrective attachment experiences, where the adolescent expresses relational ruptures to the parent and the parent provides emotional sensitivity and validation. At the end of treatment, the focus then shifts to normative developmental tasks of adolescence (e.g., promoting autonomy and competence), while simultaneously preserving the newly reinforced attachment bond.
Family-Enhanced Non-Directive Supportive Therapy (FE-NST): FE-NST (Levy & Diamond, 2010) is a 16-week treatment adapted from the Supportive Relationship Treatment Manual (Brent & Kolko, 1991). In line with NST, FE-NST emphasizes a supportive relationship between the therapist and the adolescent. During individual sessions, the therapist engages in listening, empathizing, and validating as the adolescent expresses distressing thoughts and feelings. Through these supportive interactions, the therapist assists the adolescent in vocalizing and deriving meaning from experiences that may be contributing to their current symptomatology. In the current study, FE-NST supplemented these individual adolescent sessions with one joint parent-adolescent session to conduct safety planning, as well as four parent-only psychoeducation sessions. During these sessions, parents were provided information regarding a) suicide risk assessment, b) understanding depression, c) advocacy and resource development, and d) problem-solving strategies.

2.4 Baseline Assessments of Family Support

Observed cooperative communication: Parent-adolescent conflict discussions were coded using the Goal-Corrected Partnership in Adolescence Coding System (GPACS; Lyons-Ruth, Hennighausen, & Holmes, 2005). The GPACS is designed to assess parent-adolescent interactions by coding cooperative or secure patterns of behavior as well as three dimensions of atypical interaction (i.e., punitive/control, disoriented, and role-confused) during a conflict discussion (Obsuth, Hennighausen, Brumariu, & Lyons-Ruth, 2014). While the cooperative/secure dimension has been identified as a protective factor and a predictor of attachment security, the atypical interaction patterns have been linked to a variety of maladaptive outcomes in adolescence, including disorganized attachment and psychopathology (Obsuth et al.,
as well as increased internalizing problems and engagement in risky behaviors (Kobak, Zajac, Abbott, Zisk, & Bounoua, 2017). For the purposes of the current study, only the cooperative/secure dimension was analyzed.

The GPACS is comprised of twelve items, each rated on a 5-point scale. Prior research has supported the inclusion of four items within the cooperative dimension (Kobak et al., 2017; Obsuth et al., 2014). The first item, collaborative communication, is a dyadic measure that assesses how well the parent and adolescent engage in balanced and reciprocal discussion of a goal conflict. A score of 1 is given when one individual dominates the discussion while the other is unable to express ideas or feelings, and a score of 5 is given when both members of the dyad voice their opinions comfortably and constructively ($M = 2.36, SD = 0.94$, intraclass correlation [ICC] = 0.83). The warmth/valuing scale measures the degree to which parents and adolescents share positive regard and voice statements of warmth, valuing, and care. A score of 1 indicates an absence of warmth or valuing in behaviors or statements, while a score of 5 suggests that positive regard, warmth, and valuing are a natural component of the interaction ($M = 2.68, SD = 0.98$, ICC = 0.88). The third item, parent validation of the adolescent, assesses parental openness and responsiveness to the adolescent’s opinions, ideas, and assertions. A score of 1 suggests that the parent’s behaviors or statements directly invalidate or disregard the adolescent, while a score of 5 indicates that the parent actively and appropriately seeks the adolescent’s thoughts and feelings ($M = 2.50, SD = 0.94$, ICC = 0.86). The fourth scale, adolescent respectful spontaneity, measures the adolescent’s ability to clearly and respectfully advance and support his or her opinions and attitudes during the conversation. A score of 1 indicates that the adolescent is unable to contribute an opinion, while a score of 5 suggests that the
adolescent advances and supports a viewpoint in a consistent, comfortable, and natural manner \((M = 2.48, SD = 1.00, ICC = 0.89)\). In the current study, these four items demonstrated adequate internal consistency (Cronbach’s \(\alpha = 0.89\)).

**Self-reported family conflict and cohesion:** Parents and adolescents each completed the Self-Report of Family Functioning (SRFF; Bloom, 1985). Ten items yield two scales: family cohesion and family conflict. Five items assess family cohesion (e.g., “family members really help and support one another,” “we feel close to one another in our family”), and five items assess family conflict (e.g., “we fight a lot in our family,” “family members sometimes hit each other”). Each item is assessed on a 4-point scale, with 1 indicating that the statement is “never true for my family” and 4 indicating that the statement is “very true for my family.” In the current study, family cohesion demonstrated adequate internal consistency for both parent (Cronbach’s \(\alpha = 0.78\)) and adolescent (Cronbach’s \(\alpha = 0.79\)) reports. For adolescent-rated family conflict, item 10 (“family members rarely criticize each other,” reverse coded) reduced the scale’s internal consistency and was therefore not included in analyses. The Cronbach’s alphas for parent and adolescent reports of family conflict were 0.57 and 0.66, respectively.

2.5 **Monthly Symptom Assessments**

**Depressive symptoms:** Severity of adolescent depressive symptoms was assessed using the BDI-II, a 21-item self-report measure. Items inquire about a range of depressive symptoms, including sadness, irritability, loss of interest, and worthlessness. Each item is assessed on a 4-point scale, where 0 indicates an absence of that symptom and 3 indicates the most severe option for that symptom. Total scores ranging from 14-19 are considered to indicate mild depression, scores from 20-28 indicate moderate
depression, and scores 29 and above indicate severe depression. In the current study, the BDI-II demonstrated good internal consistency, with a Cronbach’s alpha of 0.85.

**Suicidal ideation:** Adolescents’ suicidal ideation was measured using the SIQ-JR, a 15-item self-report measure. Items include statements such as “I wished I were dead,” “I thought about killing myself,” and “I thought about how I would kill myself.” Each item is rated on a 7-point scale that assesses the frequency of these suicidal thoughts, with 1 indicating the absence of the thought and 7 indicating that the thought has occurred almost every day over the course of the past month. Scores greater than or equal to 31 suggest clinically elevated symptoms. In the current sample, the SIQ-JR demonstrated good internal consistency, with a Cronbach’s alpha of 0.84.

### 2.6 Data Analytic Plan

An exploratory factor analysis (EFA) was conducted using SPSS Version 24 to examine the relationships between the multiple indicators of family support and to assess whether any of these variables could be reduced to common factors. The bivariate relationships between the family support variables, adolescent depressive and suicidal symptoms, and demographic variables were then examined. Finally, the main study aims regarding the moderating effects of pre-treatment family support on adolescent treatment response were tested using observed cooperative communication as well as parent and adolescent reports of family support as between-subject variables in hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002). Separate models examined rates of change in adolescents’ symptoms of depression and suicidal ideation. Initial examination of the rates of change in SIQ-JR and BDI-II revealed non-linear trends in both outcomes over time. To account for this non-linearity, a log-10 transformation of the time variable was used in each model (Young et al., 2016), which
allowed for an accommodation of faster rates of change early in treatment and less change in subsequent months. Slopes in each model therefore represent symptom change across log-10 transformed four-week intervals over the course of sixteen weeks. To enhance interpretation, total change in symptoms from baseline to Week 16 will also be discussed.

Observed cooperative communication and adolescent and parent reports of family support were tested as baseline moderators of individual growth models of adolescent symptoms over the course of the sixteen weeks of treatment. To test our hypothesis regarding the moderating effect of treatment condition on the relationship between family communication and adolescents’ treatment response, treatment condition and the interaction between cooperative communication and treatment condition were also included as predictors. To fit these models, time was analyzed as a within-subjects (Level-1) predictor of depressive and suicidal symptoms, with Week 0 (baseline) coded as 0. Baseline indicators of family support, treatment condition, and the interaction between cooperative communication and treatment condition were then analyzed as between-subjects (Level-2) moderators of within-subject trajectories of symptom reduction. All Level-2 predictors were grand-mean centered. Random intercepts and random slopes were estimated. All error terms were allowed to vary, and robust standard errors were analyzed to account for non-normality and outliers in the data (Raudenbush & Bryk, 2002). Final estimation of fixed effects with robust standard errors will be reported.

2.7 Missing Data

Most (69.8%) of the adolescents completed all five of the monthly assessments of depressive and suicidal symptoms, while 13.2% completed four of the monthly
assessments, 7% completed two or three assessments, and 10% completed one assessment. However, the number of repeated measures completed was not significantly related to baseline depressive or suicidal symptoms, observed cooperative communication, parent and adolescent reports of family conflict and cohesion, treatment condition, or demographic variables. Additionally, 120 adolescents completed the baseline conflict discussion. Although HLM allows for missing data on the Level-1 variable, it does not allow for missing data on the Level-2 variables. Therefore, the 120 adolescents with complete Level-2 data were included in the HLM model, and the fixed effects and variance components are based on these 120 adolescents. However, there were no significant differences between adolescents who completed the baseline conflict discussion and those that did not on any study variables, including monthly symptom outcome measures, treatment condition, and demographics. Therefore, the missing data was assumed to be missing at random, and estimates were calculated in HLM based on restricted maximum likelihood estimation.
3.1 Exploratory Factor Analysis of Baseline Family Support

To examine the underlying factor structure of the multiple indicators of family support, an EFA was conducted using the four individual items of observed cooperative communication, adolescent-rated family conflict and cohesion, and parent-rated family conflict and cohesion. The individual items of cooperative communication were included to determine whether replication of procedures followed in previous studies (Kobak et al., 2017; Obsuth et al., 2014), which suggested that these four items loaded onto a common factor, was warranted in the current study. The EFA, with a promax rotation, yielded two factors with eigenvalues greater than 1, which accounted for 66.9% of the variance in the 8 scales included. The four cooperative communication items loaded on one factor, while adolescent and parent reports of conflict and cohesion loaded on the second factor. However, in previous research examining the moderating effect of family support on adolescent treatment response, studies have typically separated parent and adolescent reports into different variables. Therefore, a second EFA was conducted with a promax rotation that fixed the number of factors to three. These three factors accounted for 76.6% of the variance in the 8 scales. The four cooperative communication items loaded on one factor, adolescent-rated conflict and cohesion loaded on a second factor, and parent-rated conflict and cohesion loaded on a third factor. Factor loadings greater than 0.40 are presented in Table 1. None of the scales cross-loaded on two factors. To be consistent with previous studies, the current
study used this three-factor model to represent the multiple indicators of family support:
observed cooperative communication (mean score of the four GPACS codes),
adolescent-rated family support (mean score of adolescent-rated conflict and cohesion),
and parent-rated family support (mean score of parent-rated conflict and cohesion).

3.2 Descriptive Analyses

Bivariate analyses were conducted to examine the zero-order correlations
between the main study variables, including baseline indicators of family support and
adolescent depressive and suicidal symptoms at baseline and Week 16, as well as
treatment condition and demographic variables. These results and descriptive statistics
are presented in Table 2. These correlations indicated that higher ratings of cooperative
communication at baseline were significantly related to lower levels of pre-treatment
family conflict and higher levels of pre-treatment family cohesion as rated by both the
parent and the adolescent. Baseline cooperative communication was not significantly
related to severity of depression or suicidal ideation at the start of treatment. However,
cooperative communication was significantly associated with symptom severity at
Week 16, with higher ratings of cooperative communication related to higher post-
treatment depressive and suicidal symptoms.

Correlations between the main study variables and demographic variables
indicated that adolescent age and gender were significantly associated with baseline
depressive symptoms, with older adolescents and females reporting higher levels of pre-
treatment depression. Baseline cooperative communication and suicidal ideation at
Week 16 were significantly related to adolescent race and the income-to-needs ratio.
Treatment condition was not significantly related to any of the study variables.
3.3 Hierarchical Linear Models

**Depressive symptoms.** A hierarchical linear model tested whether baseline indicators of family support moderated rates of change in adolescent depressive symptoms over the course of treatment. An unconditional model using depressive symptoms as the outcome examined the within-subjects and between-subjects variability in the monthly assessments of depressive symptoms. The intraclass correlation coefficient (ICC) for depression was 0.478, indicating that 47.8% of the variance in depressive symptoms is explained by between-subject variability in depressive symptoms. This therefore suggests that 52.2% of the variability in depression is due to within-subject fluctuations.

A model was then specified to examine the effects of pre-treatment observed cooperative communication and self-reports of family support, as well as the interaction between cooperative communication and treatment condition, on adolescents’ rates of change in depressive symptoms over the course of treatment. A within-subjects (Level-1) model revealed a fixed intercept of 35.16 \((t(119) = 38.37, p < 0.001)\), indicating the average starting level of adolescent depressive symptoms at baseline. This model also indicated a fixed slope of -24.31 \((t(119) = -13.39, p < 0.001)\), indicating that, on average, adolescents experienced a significant reduction in depressive symptoms over the course of treatment. From baseline to the end of treatment, the estimated total change in depressive symptoms was 17.02 points on the BDI-II. Results from the within-subjects model also indicated a significant random intercept \((SD = 7.81, \chi^2 (107) = 276.25, p < 0.001)\) and a significant random slope related to the time parameter \((SD = 13.51, \chi^2 (107) = 221.92, p < 0.001)\). This suggests significant individual differences in both starting levels and rates of change in depressive symptoms and justifies inclusion of Level-2 predictors as potential moderators of these trajectories.
Observed cooperative communication, adolescent-rated family support, parent-rated family support, treatment condition, and the interaction between cooperative communication and treatment condition were added to the model as Level-2 predictors, with the income-to-needs ratio and adolescent age, gender, and race included as controls. Results, presented in Table 3, indicated that observed cooperative communication significantly moderated the rate of change in depressive symptoms ($B = 6.09$, $t(110) = 2.76$, $p = 0.007$). On average, adolescents in families with less cooperative communication showed greater reductions in depressive symptoms over the course of treatment than adolescents in families with more cooperative communication. Cooperative communication did not have a significant effect on the starting levels of depressive symptoms. Neither adolescent nor parent reports of family support moderated adolescents’ starting levels of depressive symptoms or reductions in symptoms over the course of treatment. Adolescent age had a significant effect on the intercept ($B = 1.30$, $t(110) = 2.18$, $p = 0.03$), with older adolescents reporting higher levels of depressive symptoms at the start of treatment. Age did not have an effect on the rate of change in depressive symptoms. None of the other demographic variables included in the model had a significant effect on either the intercept or slope.

Treatment condition did not significantly moderate either starting levels of depressive symptoms or rates of change in these symptoms over the course of treatment. Further, the interaction between treatment condition and cooperative communication yielded non-significant effects on both the intercept and the slope. These results therefore suggest that the relationship between cooperative communication and treatment response did not depend on treatment condition.
Given these results, a reduced model was tested that included cooperative communication and adolescent age as the only Level-2 predictors (see Table 3). Results indicated that adolescent age remained a significant predictor of the starting levels of depression ($B = 1.34$, $t(117) = 2.22$, $p = 0.03$), but age did not significantly predict rates of change in depressive symptoms. Cooperative communication remained a significant predictor of the rate of change in depressive symptoms ($B = 6.57$, $t(117) = 3.33$, $p = 0.001$), with no significant effect on the intercept. To interpret the effect of cooperative communication on reductions in depressive symptoms, rates of change were calculated at high (one standard deviation above the mean) and low (one standard deviation below the mean) cooperative communication. Results, displayed in Figure 1, indicated that, on average, the rate of change in depressive symptoms at high cooperative communication ($B = -18.77$, $t(117) = -7.64$, $p < 0.001$) corresponded to an estimated total change of 13.14 points on the BDI-II from the beginning to end of treatment. The average rate of change in depressive symptoms at low cooperative communication ($B = -29.84$, $t(117) = -12.69$, $p < 0.001$) yielded an estimated total change of 20.89 points on the BDI-II.

**Suicidal ideation.** A hierarchical linear model also tested whether baseline indicators of family support moderated rates of change in adolescent suicidal ideation over the course of treatment. An unconditional model was tested first, using symptoms of suicidal ideation as the outcome. The ICC for suicidal ideation was found to be 0.356, indicating that 35.6% of the variance in suicidal ideation is explained by between-subject variability, while 64.4% is due to within-subject fluctuations.

A model was then specified to examine the effects of observed cooperative communication, adolescent-rated family support, and parent-rated family support, as
well as the interaction between cooperative communication and treatment condition, on rates of change in suicidal ideation over the course of treatment. A within-subjects (Level-1) model revealed a fixed intercept of 48.66 ($t(119) = 34.17, p < 0.001$), indicating the average starting level of adolescent suicidal ideation at baseline. This model had a fixed slope of -41.80 ($t(119) = -14.95, p < 0.001$), indicating that, on average, adolescents experienced a significant reduction in suicidal ideation over the course of treatment. From baseline to the end of treatment, the estimated total change in suicidal ideation was 29.26 points on the SIQ-JR. This within-subjects model also indicated a significant random intercept ($SD = 12.23, \chi^2 (107) = 288.56, p < 0.001$) and a significant random slope related to the time parameter ($SD = 21.24, \chi^2 (107) = 225.92, p < 0.001$). Given these significant individual differences in the starting levels and rates of change in suicidal ideation, inclusion of Level-2 predictors as potential moderators of these trajectories was warranted.

Observed cooperative communication, adolescent-rated family support, parent-rated family support, treatment condition, and the interaction between cooperative communication and treatment condition were added to the model as Level-2 predictors, with the income-to-needs ratio and adolescent age and race included as controls. Results, presented in Table 4, revealed that White adolescents experienced less change in suicidal symptoms over the course of treatment than non-White adolescents ($B = 16.63, t(111) = 2.59, p = 0.01$). However, none of the family support indicators had a significant effect on the starting level or rates of change in suicidal ideation. Additionally, there were no significant effects regarding treatment condition or the interaction between treatment condition and cooperative communication.
Table 1. Factor Loadings for Indicators of Family Support

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*Note: Factor loadings greater than .40 are reported.*
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Note: Treatment condition coded 1 = ABFT, 0 = FE-NST; adolescent gender coded 1 = male, 0 = female; adolescent race coded 1 = white, 0 = non-white; + p < .10; * p < .05; ** p < .01; *** p < .001.
Table 3. Final Estimation of Fixed Effects (with Robust Standard Errors) for BDI-II

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<th>Fixed Effects</th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t-ratio</th>
<th>p-value</th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t-ratio</th>
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Note: N = 120, df = 110 for full model and df = 117 for reduced model; treatment condition coded 1 = ABFT, 0 = FE-NST; adolescent race coded 0 = non-White, 1 = White; adolescent gender coded 0 = female, 1 = male; * p < .05; ** p < .01; *** p < .001. Unstandardized coefficients are reported.
Table 4. Final Estimation of Fixed Effects (with Robust Standard Errors) for SIQ-JR

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<td>&lt;0.001</td>
</tr>
<tr>
<td>Cooperative communication (CC)</td>
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<td>1.93</td>
<td>1.09</td>
<td>0.28</td>
</tr>
<tr>
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<td>2.80</td>
<td>0.84</td>
<td>0.40</td>
</tr>
<tr>
<td>CC X TC</td>
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<td>3.66</td>
<td>-0.34</td>
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<tr>
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</tr>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
<td>Intercept</td>
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<td>2.54</td>
<td>-16.58</td>
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<td>Cooperative communication (CC)</td>
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</tr>
<tr>
<td>Treatment condition (TC)</td>
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<td>CC X TC</td>
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<tr>
<td>Adolescent race</td>
<td>16.63*</td>
<td>6.43</td>
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<td>0.01</td>
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Note: N = 120, df = 111; treatment condition coded 1 = ABFT, 0 = FE-NST; adolescent race coded 0 = non-White, 1 = White; § p < .10; * p < .05; ** p < .01; *** p < .001. Unstandardized coefficients are reported.
Figure 1. Rates of Change in Depressive Symptoms Over the Course of Treatment at High and Low Cooperative Communication
Chapter 4

DISCUSSION

Our findings support our view that adolescents who enter treatment with less cooperative and validating communication with their parents will show greater benefit from treatments designed to increase the adolescent’s access to a supportive relationship with a parent or therapist. This effect of our pre-treatment assessment of parent-adolescent communication on adolescents’ treatment response was evident in the rate of decline in depressive symptoms and occurred despite having no significant differences in starting levels of depressive symptoms. This finding is consistent with one prior study (Young et al., 2009), in which adolescents reporting high maternal conflict showed greater reductions in depressive symptoms in IPT-AST than in school counseling. Given that adolescent depression may be precipitated and perpetuated by a variety of factors other than lack of family support (Gladstone et al., 2011), depressed adolescents who engage in more cooperative and validating communication with their parents at the start of treatment may need interventions that target factors other than lack of support as precipitants for depressive symptoms.

Our observational assessment of parent-adolescent communication provided a nuanced, developmentally-sensitive measure of family interactions that moderated adolescents’ response to ABFT and FE-NST. From an attachment perspective, secure parent-child relationships can be conceptualized as a goal-corrected partnership, where the child and parent engage in cooperative communication to negotiate goal conflicts (Bowlby, 1969/1982; Kobak & Duemmler, 1994). Through these interactions, children develop confidence in their ability to assert their own opinions while simultaneously
learning that their parents will be sensitive and validating of their point of view. These
goal-corrected partnerships are maintained during adolescence, when parent-adolescent
dyads must increasingly negotiate the adolescent’s desire for autonomy (Allen, 2008;
Kobak et al., 2017). Therefore, the GPACS coding system is designed to capture
underlying family processes that may contribute to or buffer against the adolescent’s
symptomatology. Further, the GPACS codes allow for explicit ratings of the
adolescent’s confidence in the parent and of parental validation and support, thereby
providing a more direct assessment of the treatment targets of both ABFT and FE-NST
than the more general indicators of conflict and cohesion assessed through the self-
reports.

Contrary to expectation, treatment condition did not moderate the effect of
family communication on adolescents’ response to treatment, suggesting that
adolescents with less supportive and validating interactions with their parents benefited
equally well from ABFT and FE-NST. These findings align with results from the
primary outcome analyses for this RCT, which found no significant differences between
ABFT and FE-NST in reductions of suicidal and depressive symptoms (Diamond et al.,
submitted for publication). Diamond and colleagues (submitted for publication)
attributed the lack of treatment differences to a variety of factors, including common
elements shared by ABFT and FE-NST. For example, both treatments included parent
participation and parent psychoeducation, and both treatments provided the family with
support and validation from the therapist. While these common elements can inform an
understanding of why both treatments worked equally well for adolescents in general
(Sprenkle, Davis, & Lebow, 2009), they can also help to explain why treatment
condition did not moderate the effect of family communication on treatment response.
Although ABFT more explicitly targeted parent-adolescent communication patterns, both ABFT and FE-NST worked to enhance parental involvement and support for the adolescent. Additionally, FE-NST therapists systematically elicited, validated, and supported adolescents as they voiced thoughts, feelings, and opinions, thereby providing the adolescents with the supportive and validating relationship that is enhanced between the parent and adolescent in the ABFT condition.

The effect of family communication on treatment response was limited to adolescents’ reports of depressive but not suicidal symptoms. The lack of effects on reductions in suicidal symptoms may have resulted from the fact that, as a standard of care, all adolescents received access to 24-hour crisis hot lines and emergency rooms, weekly symptom check-ins with study staff and therapists, and safety planning (Stanley & Brown, 2012). Allowing for close monitoring and management of suicide risk, these procedures may have accounted for much of the adolescents’ reductions in suicidal symptoms (Brent et al., 2013), leaving treatment response for suicidality less dependent on either the degree of pre-treatment parental support and validation or the specific nature of the treatment condition. These common treatment elements may therefore help to explain why adolescents with varying levels of parental validation and support showed similar reductions in suicidal symptoms over the course of treatment and why these adolescents responded equally well to ABFT and FE-NST.

Neither adolescent nor parent reports of family environment moderated adolescents’ treatment response assessed with either depressive or suicidal symptoms. As a result, we failed to replicate prior studies that identified adolescent or parent reports of family environment as factors that reduced adolescents’ benefit from treatment (Asarnow et al., 2009; Feeny et al., 2009; Rengasamy et al., 2013; Rohde et
al., 2006). The failure to replicate previous findings may be attributable to several factors. First, prior moderating effects of self-reports were largely limited to treatments that primarily targeted enhancing adolescents’ self-regulatory skills. For example, CBT, one of the most commonly studied treatment modalities (Curry, 2014), focuses on developing adolescents’ skills to identify and challenge distorted thinking patterns to more effectively regulate emotions and solve problems. The fact that the current study examined interventions with different treatment targets (i.e., enhancing access to parental or therapist support and validation) likely helps to explain the lack of replication.

4.1 Strengths and Limitations

The current study was the first, to our knowledge, to test an observational assessment of parent-adolescent communication as a moderator of depressed and suicidal adolescents’ treatment response. Although the GPACS coding system has been previously used in developmental research with high-risk samples, this is the first time it has been used in a treatment study. Further, we examined the moderating effect of family communication in two treatments specifically designed to enhance the adolescent’s access to a supportive and validating relationship with a parent or therapist. Given these innovations, we provided support for family communication as a moderator of treatment benefit for depressed and suicidal adolescents receiving ABFT and FE-NST treatments. Overall, the current results suggest the promise of using an observational methodology to inform clinical decision-making processes, which deserves further attention in future studies.

Despite these methodological strengths, there are several limitations to consider. First, given the innovative nature of the study, future research examining observational
assessments of family communication within the context of other treatment studies is needed before the current results can be extended beyond ABFT and FE-NST. Additionally, characteristics of the current sample also limit the generalizability of the findings. Although the sample was demographically diverse, the severity of the adolescents’ suicidal and depressive symptoms at baseline may limit the generalizability of the results. Given that inclusion criteria required at least moderate depressive symptoms and severe suicidal ideation, the present findings regarding the effects of family communication on treatment response may not generalize to less severe samples. Additionally, the current sample was predominantly female. Although this is not unusual for samples of depressed adolescents, as girls demonstrate a sharp increase in depressive symptoms during adolescence while boys do not (Twenge & Nolen-Hoeksema, 2002), it does limit our ability to detect gender differences. Overall, replication of the current results in other samples is essential.

4.2 Conclusion and Future Directions

Systematic, observational assessment of pre-treatment family communication holds important implications for understanding adolescents’ response to treatments specifically designed to increase adolescents’ access to parental or adult support and validation. The current findings point to the efficacy of treatments such as ABFT and FE-NST for depressed adolescents experiencing less supportive and validating communication with their parents at the beginning of treatment. Over the course of treatment, these adolescents demonstrated greater reductions in their depressive symptoms than did adolescents who entered treatment with more supportive and validating parental communication. Although no treatment differences were found over the course of the sixteen weeks of treatment, future research should examine whether
adolescents who entered treatment with less parental support and validation benefited more from ABFT than FE-NST over the course of post-treatment follow-up. For these adolescents, the supportive relationship with the therapist may be sufficient in the short-term to reduce depressive symptoms, but it is unclear whether these effects persist after the adolescent leaves treatment. Future research may also work to further elucidate the role of family support in rates of change in adolescents’ suicidal symptoms, as well as the identification of other moderators of treatment response. This improved understanding can assist in personalizing treatment selection and increasing the likelihood that a distressed adolescent will benefit from intervention.


Adolescent Psychiatry. 52(12), 1260-1271. doi:10.1016/j.jaac.2013.09.009


Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications*


Appendix

INSTITUTIONAL REVIEW BOARD APPROVAL
DATE: May 12, 2017

TO: Roger Kobak, Ph.D.
FROM: University of Delaware IRB

STUDY TITLE: [261940-7] Attachment Based Family Therapy for Suicidal Adolescents

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED

APPROVAL DATE: May 12, 2017

EXPIRATION DATE: May 5, 2018

REVIEW TYPE: Administrative Review

REVIEW CATEGORY: Administrative Review

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB (HUMANS) has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Administrative Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.
If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.