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# Mediators of Interpersonal Psychotherapy for Depressed Adolescents On Outcomes in Latinos: The Role of Peer and Family Interpersonal Functioning

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## Mediators of Interpersonal Psychotherapy for Depressed Adolescents on Outcomes in Latinos: The Role of Peer and Family Interpersonal Functioning

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# Mediators of Interpersonal Psychotherapy for Depressed Adolescents on Outcomes in Latinos: The Role of Peer and Family Interpersonal Functioning

**Abstract**

***Objective***: Peer and family interpersonal functioning were examined as mediators of the impact of Interpersonal Psychotherapy for Depressed Adolescents (IPT-A; Mufson, Dorta, Moreau, & Weissman, 2004) on depression and suicidal ideation among Latino youth. ***Method***: Only youth self-identifying as Latino ($n$=50) were included in the analyses. The majority were female (86%) with a mean age of 14.58 ($SD$=1.91). The current sample was drawn from the intent to treat sample of a clinical trial examining the effectiveness of IPT-A as compared to treatment as usual (TAU; Mufson, Dorta, Wickramaratne et al., 2004). Youth were randomly assigned to receive IPT-A or TAU delivered by school-based mental health clinicians. Assessments, completed at baseline and at weeks 4, 8, and 12 (or at early termination), included self-report measures of depression and interpersonal functioning as well as clinician-administered measures of depression. ***Results***: Multilevel modeling indicated that IPT-A led to greater improvement in interpersonal functioning with family and peers. Improved family and peer interpersonal functioning emerged as significant partial mediators of the relationship between IPT-A and depression. Only improved family interpersonal functioning emerged as a significant partial mediator of the relationship between IPT-A and suicidal ideation. However, this indirect effect was small, suggesting that most of the benefit of IPT-A for suicidal ideation appears to proceed through a pathway other than family interpersonal functioning. ***Conclusion***: These results suggest that the impact of IPT-A on depressive symptoms is partially mediated by family and peer interpersonal functioning and contributes to our understanding of the mechanisms of IPT-A.

***Keywords***: Interpersonal Psychotherapy, Suicidal Ideation, Adolescence, Interpersonal Functioning, Mediators

**Resumen**

***Objetivo***: Examinar el funcionamiento interpersonal con compañeros y con familiares como mediadores de los efectos de la psicoterapia interpersonal para adolescentes deprimidos (IPT-A; Mufson, Dorta, Moreau, & Weissman, 2004) en jóvenes latinos con depresión e ideación suicida. ***Método***: Solamente los jóvenes que se identificaron como latinos (*n*=50) se incluyeron en los análisis. La mayoría fue feminina (86%) con edad media de 14.58 (*SD*=1.91). La muestra actual se extrajo de la muestra del tipo intención de tratar de un ensayo clínico examinando la eficacia de IPT-A en comparación con el tratamiento habitual (TAU; Mufson, Dorta, Wickramaratne et al., 2004). Los jóvenes fueron asignados aleatoriamente para recibir IPT-A o TAU proporcionado por terapeutas dentro de los programas escolares de salud mental. Las evaluaciones, completadas al comienzo del estudio (punto de referencia) y en las semanas 4, 8, y 12 (o terminación anticipada), incluyeron autoinformes de depresión y de funcionamiento interpersonal como también encuestas completadas por los terapeutas sobre síntomas de depresión. ***Resultados***: Los modelos multinivel indicaron que los jóvenes que recibieron IPT-A tuvieron mayor mejoría en el funcionamiento interpersonal con compañeros y con familiares. La mejoría del funcionamiento interpersonal con compañeros y con familiares surgieron como mediadores parciales pero significativos de la relación entre IPT-A y la depresión. La mejoría únicamente del funcionamiento interpersonal con familiares surgió como un mediador parcial pero significativo de la ideación suicida. Sin embargo, este efecto indirecto fue pequeño indicando que la mayoría del beneficio de IPT-A para la ideación suicida procede a través de un camino distinto al funcionamiento interpersonal con familiares. ***Conclusión***: Estos resultados indican que los efectos de IPT-A en los síntomas de la depresión son parcialmente mediados por

el funcionamiento interpersonal con compañeros y con familiares y contribuyen a nuestro entendimiento de los mecanismos del IPT-A.

Latinos are the largest and one of the fastest growing minority groups in the U.S., thus the elevated rates of depressive symptoms, including suicidal ideation and behavior, among Latino youth are a major public health concern (Potochnick & Perreira, 2010). For the past 20 years, national surveys like the Youth Risk Behavior Surveillance Survey indicate that Latino youth are more likely to feel sad or hopeless, to seriously consider suicide, and to attempt suicide than White and African-American youth (Kann et al., 2016; Zayas, Hausmann-Stabile, & Kuhlberg, 2011). There is an urgent need to provide depressed Latino youth with empirically supported treatment (EST), as they are often less likely than White youth to have access to quality mental health services (Alegria et al., 2010; Hough et al., 2002). However, few ESTs have been formally tested with or without adaptations for ethnic minority groups, such as Latinos (Bernal & Sharrón-del-Río, 2001; Huey & Polo, 2008; Mufson et al., 2014). Additionally, little is known about how ESTs for depression work (Kazdin, 2007; Lemmens, Muller, Arntz, & Huibers, 2016). Understanding how ESTs work for the most vulnerable groups is key to reducing health disparities in treatment access and use.

Previous studies have found that youth treated with interpersonal psychotherapy for depressed adolescents (IPT-A) have demonstrated fewer depressive symptoms and better social and global functioning post-treatment than youth in control conditions (Mufson, Weissman, Moreau, & Garfinkel, 1999; Rossello & Bernal,1999). Although most IPT-A outcome studies have used predominantly Latino samples, IPT-A was not specifically adapted for Latinos. It is possible that interventions that have not been adapted for specific cultures may contain features that make them well-suited to these cultural groups. Rosselló and Bernal (1999) reported that the focus on current interpersonal conflicts makes Interpersonal Psychotherapy (IPT) a culturally acceptable treatment to Latinos because of its relevance to Latino values of familismo and

personalismo. Familismo refers to Latino culture's emphasis on the importance of the family's well-being over one's individual needs and of connectedness to one's family. Personalismo refers to the desiring and valuing of personal relationships with others (Añez, Paris, Bedregal, Davidson, & Grilo, 2005). With IPT's emphasis on restoring harmony to one's relationships, both familial and peer, IPT may help Latino patients feel that their values are respected and incorporated into the goals of treatment without requiring additional cultural adaptations (Mufson et al., 2014). Moreover, the problem areas that are a core feature of IPT-A case conceptualization are universally identified problem areas in adolescent depression and cultural issues can be easily incorporated into the existing IPT-A framework (Bolton et al., 2003; Mufson et al., 2014; Rossello & Bernal, 1999).

There are few studies of ESTs delivered to ethnic minority groups and the mechanisms of therapeutic change for many ESTs remain unknown (Kazdin, 2007). Poor family interpersonal functioning, including parent-adolescent conflict and poor family communication styles, have been consistently linked to increased risk of depression and specifically to suicidal ideation and behaviors among youth in general (Beautrais, 2000; Nrugham et al., 2008; Sheeber et al., 1997). However, poor family interpersonal functioning might be an especially relevant risk factor for Latino youth given the centrality of the family in Latino culture (Kuhlberg et al., 2010). Some argue that the discrepancy in acculturation between parents and children has negative mental health consequences for Latino youth from immigrant households (Cespedes & Huey, 2008). Specifically, Latino youth grow up within a sociocultural context that puts traditional (e.g., familismo) and mainstream (e.g., adolescent autonomy) cultural values at odds. Latino youth adopt mainstream values faster than their parents, and these differential rates of acculturation between Latino youth and their parents create tension. Ultimately, such discrepancies may

increase the amount/severity of conflict between parents and youth (Cespedes & Huey, 2008; Goldson et al., 2008; Zayas et al., 2005). Research indicates that Latino youth who have conflict with parents, perceive their parents as less caring, and have poorer communication with their parents, are more likely to become depressed and to consider suicide or make an attempt (Cespedes & Huey, 2008; De Luca et al., 2012; Garcia et al., 2008). Thus, improving family and peer interpersonal functioning might be important targets for treatment, particularly among Latino youth given the cultural values of familismo.

Peer relationships are also important to youths' psychological adjustment and well-being (Way & Robinson, 2003), so much so that poor peer interpersonal functioning has been shown to impact upon youth depression and suicidality (Prinstein et al., 2000). A number of peer-related factors have been linked to youth depression including lower levels of peer support, greater levels of peer rejection, lack of a substantive peer network, and social isolation (Bearman & Moody, 2004; Bushman et al., 2015; Prinstein et al., 2000). Studies examining the link between peer relationships and depression among Latino youth have found that poor peer interpersonal functioning is associated with increased depressive symptoms (e.g., Cooley et al., 2015; Forster et al., 2013; La Greca & Harrison, 2005). Less is known regarding the association between peer interpersonal functioning and suicidality among Latino youth (Winterrowd, Canetto, & Chavez, 2011). However, some research indicates that suicidal ideation and behavior among Latino youth might not be strongly linked to peer relationship problems (Zayas & Pilat, 2008; De Luca et al., 2012; Winterrowd et al., 2011). Previous studies were conducted with community samples of Latino youth and it is unclear whether these findings generalize to clinically referred depressed samples who typically experience greater impairment in peer relationships (Prinstein et al., 2000). No existing research has examined the role of peer interpersonal functioning in suicidality

among clinically referred samples of depressed Latino youth. Additionally, the extent to which peer interpersonal functioning has an impact on Latino youth suicidal ideation relative to family interpersonal functioning also remains unclear.

Existing IPT-A research has focused on outcomes, and little is known regarding the mechanisms of therapeutic change. A central tenet of IPT-A is that dysfunction in interpersonal interactions and relationships plays an important role in the development and sequelae of youth depression. Improving the interpersonal context is thought to help change the course of a depressive episode and result in recovery. No existing research examines if improving family and/or peer interpersonal functioning mediates the impact of IPT-A on outcomes. Evaluating mediators of therapeutic change may help guide clinicians to identify the best treatments for specific individuals and better optimize outcomes (Kazdin, 2007). Examining whether IPT-A directly impacts interpersonal functioning which, in turn, directly affects depression and suicidal ideation will help determine whether IPT-A is an effective treatment specifically for depressed Latino youth with suicidal ideation.

This study is a secondary data analysis of a larger study comparing the effectiveness of IPT-A with treatment as usual (TAU; Mufson, Dorta, Wickramaratne et al., 2004) for the treatment of adolescent depression. It aims to extend previous IPT-A research and examine whether improved family and peer interpersonal functioning mediates the relationship between treatment condition and a decrease in depression and suicidal ideation. IPT-A has been found to lead to improvement in interpersonal functioning and depression previously (Mufson, Dorta, Wickramaratne et al., 2004). It is hypothesized that IPT-A will lead to greater improvement in family and peer interpersonal functioning among Latino youth relative to Latino youth in the

TAU treatment condition. Improved family and peer interpersonal functioning, in turn, will mediate the relationship between IPT-A and reduction in depression and suicidal ideation.

## Method

### Participants

Only youth self-identifying as Latino ($n$=50) were included in the analyses. The majority were female ($n$=43) with a mean age of 14.58 ($SD$=1.91). Most Latino youth were born in the U.S. ($n$=36). The remainder of the sample were born in the Dominican Republic ($n$=8), Puerto Rico ($n$=4), and Central or South America ($n$=2).

The current study sample was drawn from the intent to treat sample of a clinical trial examining the effectiveness of IPT-A as compared to TAU (Mufson, Dorta, Wickramaratne et al., 2004). The original sample included 63 youths between the ages of 12-19 who were referred for mental health treatment in five school-based health clinics in New York City. To be eligible, youth were required to meet the following criteria: Hamilton Rating Scale for Depression (Hamilton, 1967) ≥ 10; Children's Global Assessment Scale (Shaffer et al., 1983) ≤ 65; and Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM–IV; American Psychiatric Association, 1994) diagnosis of major depression, dysthymia, depressive disorder not otherwise specified, or adjustment disorder with depressed mood. Youth were not eligible if they were intellectually disabled, actively suicidal, in current treatment for depression, or taking antidepressant medication. They were also excluded if they had a life-threatening medical illness, psychosis, schizophrenia, or a substance-related disorder. See Mufson et al. (2004) for a complete description of the trial and the Consolidated Standards of Reporting Trials (CONSORT) flow chart.

Thirteen youth from the intent to treat sample were not included in the current analyses because they did not self-identify as Latino. Of the participants not included in the analyses, 76.9% were female (*n*=10), while nine self-identified as African-American, one as Asian, and three as Other. The mean age was 15.00 (*SD*=2.08).

**Clinicians**

Participants received services from 13 clinicians, including 11 social workers and two doctoral-level clinical psychologists. The ethnicities of the providers were: 46.2% White, 46.2% Latino, and 7.7% African-American. Therapists were predominantly female (84.6%) and bilingual (76.9%). Approximately half the clinicians (six social workers and one psychologist) were trained in IPT-A (Mufson et al., 2004).

**Treatment**

Youth and clinicians working in school-based clinics were randomized to either IPT-A or TAU. IPT-A is a 12-session, evidence-based psychotherapy that aims to decrease depressive symptoms by helping youth improve their relationships and interpersonal interactions. Treatment addresses one or more of four interpersonal problem areas: grief, role disputes, role transitions, or interpersonal deficits (Mufson et al., 2004). The first eight sessions were 35 minutes and held weekly for eight weeks. The remaining four sessions were scheduled at varying intervals over the following eight weeks.

TAU consisted of whatever psychological treatment the youth would have received in the school-based clinic. All TAU youth received weekly individual supportive psychotherapy. Eight youths also received one to three family/parent sessions, and five youths participated in group therapy. TAU clinicians predominantly described their theoretical orientation as psychodynamic. At the completion of each TAU therapy session, clinicians completed the Therapeutic

Procedures Inventory (McNeilly & Howard, 1991)—a checklist of commonly used psychotherapy techniques. The most common treatment strategies endorsed were gaining a better understanding of the patient, establishing a genuine person-to-person rapport with the patient, and helping the patient talk about feelings and concerns. For a complete description of attrition, treatment adherence, clinician characteristics, and treatment fidelity, see Mufson, Dorta, Wickramaratne et al. (2004).

**Assessments**

A psychologist or social worker blind to the youth's treatment conducted assessments at baseline, weeks four, eight, and 12; or at early termination.

**Depression.** The Beck Depression Inventory (BDI; Beck et al., 1988) is a 21-item, self-report measure that was used to assess depressive symptoms. The BDI has been found to be reliable in assessing depression in youth and used in previous studies with Latino youth (Corona et al., 2005; Mufson et al., 1999).

The Hamilton Rating Scale for Depression (HRSD; Hamilton, 1997; Williams, 1988) is a 24-item clinician rated measure used to examine depressive symptoms. The HRSD has been found to be a reliable instrument for depression and used in previous research with Latino youth (Mufson et al., 1999; Rosello & Bernal, 1999). For this study, the suicide item was removed and the HRSD score obtained without this item was used to control for depressive symptoms for the suicidal ideation analyses.

**Suicidal ideation.** Item nine from the BDI was used to assess self-reported suicidal ideation. Participants rated this item from zero ("I don't have any thoughts of killing myself") to four ("I would kill myself if I had the chance"). Item nine from the BDI has been shown to be significantly correlated with the Beck Scale for Suicidal Ideation in a sample of mentally ill

youth ($r$=.69, $p$<.001; Steer, Kumar, & Beck, 1993). Participant responses to this item were dichotomized with "0" indicating no suicidal ideation and "1" indicating suicidal ideation.

**Perceived interpersonal functioning**. The Social Adjustment Scale—Self-Report (SAS-SR; Weissman et al., 1976) is a 23-item self-report measure that examines interpersonal functioning in four major domains: friends, school, family, and dating. Higher scores indicate greater dysfunction. Given that the focus of the study was on peer and family interpersonal functioning and the low reliability of the Dating subscale in previous research, only the Friends and Family subscales were used. The Friends subscale (Cronbach's alpha = .54) was used to assess social functioning with peers. The Family subscale (Cronbach's alpha = .67) was used to assess youths' global perceptions of family relations, including the extent to which youth feel they can talk to their parents about problems, worry about their family members, and feel that their families have let them down. The SAS-SR has previously been used with Latino youth (Mufson et al., 1999).

**Data Analytic Plan**

Baseline characteristics of participants were compared using univariate statistics (e.g., *t*-test, Chi-square). Given the nested nature of the data, multilevel modeling was used to examine the main study hypotheses. We used Hierarchical Linear Modeling 7 (HLM 7; Raudenbush, Bryk, & Congdon, 2011) with repeated measures (level 1) nested within participants (level 2).

For depression on the BDI, a two level HLM model using full maximum likelihood estimation was computed. HLM was used because 1) it allows the inclusion of all participants, regardless of missing data, while efficiently handling missing data, and 2) it is considered the preferred method to analyze longitudinal psychiatric data (Seidel et al., 2009). At Level 1, depression varied within participants over time as a function of a person-specific growth curve.

This level tested for time effects, estimating the change in depression across the baseline, 4-, 8-, and 12-week assessment points. Time was coded such that the intercept reflected the initial level of depression at baseline. Treatment group (IPT-A = 1, TAU = 0) was included as a Level 2 predictor. The time x group interaction was tested by including a cross-level effect between time at Level 1 and treatment group at Level 2. For suicidal ideation, a similar two-level logistic (bernouli) model using full maximum likelihood estimation was used because the outcome variable was dichotomous.

To test our mediation hypotheses, we examined whether the time x group interaction had an indirect effect on depression on the BDI and/or suicidal ideation from the BDI through either peer or family interpersonal functioning. The indirect effect is defined by the product of the *a* path (predictor to mediator) and the *b* path (mediator to outcome). To test the indirect effect, we used the asymmetric distribution of products test (Fairchild & MacKinnon, 2009). This method calculates the size of the indirect effect (*ab*) and then computes confidence intervals for *ab*. If the 95% confidence interval does not include zero, then the indirect effect is considered significant (Fairchild & MacKinnon, 2009). The significance of the indirect effect was calculated using a Monte Carlo method with 20,000 resamples (Selig & Preacher, 2008). The effect size of the indirect effect was also calculated by taking a ratio of the indirect effect to the direct effect, $ab/(ab + c)$ (Preacher & Kelley, 2011).

For each outcome, two-level HLM models with time, treatment group, and the time x group interaction term as predictors were computed for peer and family interpersonal functioning separately, with the interaction term producing estimates for the *a* paths. When examining peer and family interpersonal functioning as predictors of depression and/or suicidal ideation for the *b*

paths, we entered peer and family interpersonal functioning as Level 1 time-varying covariates. The time x group interaction was also entered into this model for the $c'$ path.

### Missing Data

A high response rate was achieved. The final data set consisted of 189 suicidal ideation measurements (94.5% of the possible total of 200), 189 family interpersonal functioning measurements (94.5% of the possible total of 200), 189 peer interpersonal functioning measurements (94.5% of the possible total of 200), and 189 depressive symptom measurements (94.5% of the possible total of 200). There were no differences between treatment groups in the mean number of measurements.

## Results

The treatment groups did not differ significantly in terms of age, gender, depressive symptoms on the HRSD or BDI, suicidal ideation, and family or peer interpersonal functioning at baseline. Forty-two percent of participants reported having thoughts of suicide at baseline. Means and standard deviations for the outcome and mediator variables are presented in Table 1.

### Depression

Given that the sample was primarily female (86%), gender differences in depression were not examined. A linear model with random slopes and intercepts revealed a significant time x group interaction predicting depression on the BDI ($p$=.041; See Table 2). Participants in IPT-A showed significantly greater reductions in depression than TAU participants. Testing simple slopes for significance indicated that IPT-A was associated with a greater acceleration in the reduction of depression (simple slope = -5.27, $t$ = -8.48, $p < .001$) compared to TAU (simple slope = -2.99, $t$ = -3.35, $p < .01$).

Table 3 displays all relevant paths, a 95% CI for the indirect effects, and an effect size for the indirect effects. We first tested whether the time x group interaction predicted peer and family interpersonal functioning (*a* paths). As hypothesized, participants in IPT-A showed significantly greater improvement in peer ($p$=.048) and family ($p$=.036) interpersonal functioning than TAU participants (See Tables 2 and 3). Next, we examined each mediator, individually, as a predictor of depression controlling for the time x group interaction (*b* paths in Table 3). Peer interpersonal functioning emerged as a significant predictor of depression ($p$<.001) and the time x group interaction was no longer significant ($p$=.090; $c'$ path in Table 3). The proportion mediated was 27%, indicating that IPT-A led to a greater improvement in peer interpersonal functioning, which in turn led to a small reduction in depression (See Table 3). Similarly, family interpersonal functioning emerged as a significant predictor of depression ($p$<.001) and the time x group interaction was no longer significant ($p$=.429). The proportion mediated was 61%, indicating that IPT-A led to a greater improvement in family interpersonal functioning, which in turn led to a moderate reduction in depression (See Table 3).

Finally, we examined peer and family interpersonal functioning simultaneously as mediators. Peer interpersonal functioning mediated changes in depression after controlling for family interpersonal functioning ($p$<.01). The proportion mediated was 38%. Family interpersonal functioning also mediated changes in depression after controlling for peer interpersonal functioning ($p$<.001). The proportion mediated was 62% (See Table 4).

**Suicidal Ideation**

A linear model with random slopes and intercepts revealed a significant time x group interaction predicting suicidal ideation (OR 0.40, CI= 0.17-0.95, $p$=.023; See Table 2). IPT-A participants had significantly lower odds than TAU participants of reporting suicidal ideation.

Testing simple slopes for significance indicated that IPT-A was associated with a greater acceleration in the reduction of suicidal ideation (simple slope = -1.13, $z$ = -3.00, $p$ < .01) compared to TAU (simple slope = -0.20, $z$ = -0.92, $p$ = .36). Since depression is one of the strongest predictors of suicidal ideation among youth (Buchman et al., 2014), a separate set of analyses was conducted controlling for depressive symptoms on the HRSD (without suicide item) by adding the HRSD as a time-varying covariate to the model. After controlling for depressive symptoms on the HRSD, the odds ratio was tempered changing from 0.40 to 0.53 (CI= 0.21-1.39, $p$ =.195). Nonetheless, it seems like most of the treatment effect on suicidal ideation is independent of changes in depression.

We examined each mediator, individually, as a predictor of suicidal ideation controlling for the time x group interaction (*b* paths in Table 3). Peer interpersonal functioning did not emerge as a significant predictor of suicidal ideation ($p$=.102) and the time x group interaction remained significant ($p$=.043; $c'$ path in Table 3). However, family interpersonal functioning emerged as a significant predictor of suicidal ideation ($p$<.001) and the time x group interaction was no longer significant ($p$=.084). The proportion mediated was 19%, indicating that IPT-A led to a greater improvement in family interpersonal functioning, which in turn led to a slight reduction in suicidal ideation (See Table 3).

A separate set of analyses was conducted controlling for depressive symptoms on the HRSD (without suicide item) by adding the HRSD as a time-varying covariate to all the models. After controlling for depressive symptoms, family interpersonal functioning was no longer a significant predictor of suicidal ideation ($p$=.157) and the time x group interaction was also no longer significant ($p$=.163).

## Discussion

This study aimed to extend previous IPT-A research (e.g., Mufson et al., 2004) and examine whether change in family and peer interpersonal functioning mediated the impact of IPT-A on depression and suicidal ideation, as these constructs would be the putative mechanisms through which IPT-A would be effective. Consistent with our hypotheses, IPT-A led to a greater improvement in family and peer interpersonal functioning. Family and peer interpersonal functioning emerged as significant partial mediators of the relationship between treatment group and depression. Improved family interpersonal functioning but not peer functioning emerged as a significant partial mediator of the relationship between treatment group and suicidal ideation. IPT-A had a small indirect effect on suicidal ideation in Latino youth via improved family relations.

The impact of IPT-A on family interpersonal functioning, depression and concomitant suicidal ideation may be explained by its ability to target family cohesion, an important aspect of familismo. Key components of familismo include family interconnectedness and the belief that family members can turn to each other in times of need (Peña et al., 2012). IPT-A's use of techniques like perspective taking and the examination and mending of dysfunctional communication patterns may have helped to reduce tension related to typical Latino adolescent-parent conflict such as discrepancies in acculturation and the struggle for autonomy, thereby strengthening the bonds between family members. Other studies examining the effect of increasing connectedness between family members have similarly found improvements in depressive symptoms among Latino youth. For instance, Zayas et al. (2011) found that greater mother-daughter mutuality (i.e., bidirectional exchange of feelings, thoughts, and actions between people in a relationship) was linked to fewer internalizing symptoms among daughters, which led to a reduction in the risk of suicide attempts among a sample of Latina girls with a

history of suicide attempts. Thus, improving family relations by improving parent-youth communication, reducing conflict, and increasing mutuality should be an important target for treatment with depressed and suicidal Latino youth.

IPT-A also had a significant impact on peer interpersonal functioning, which in turn led to a reduction in depression. This indirect effect might be explained by the emphasis IPT-A places on interpersonal skill-building, enhancing social support, and addressing interpersonal problems with peers. Although peer relationship problems are important to most youth, they might be particularly relevant to Latinos given the cultural value of personalismo, which emphasizes the importance of building and maintaining personal relationships with others (Reyes & Elias, 2011). For instance, Way et al. (2001) found that Latino adolescents were more likely than African-American and Asian adolescents to have "ideal" close friendships characterized by high levels of affection, intimacy, and satisfaction and low levels of conflict. Our results suggest that depressed Latino youth are receptive to and benefit from interventions that provide interpersonal strategies for improving their relationships with peers.

Our results also indicated that family interpersonal functioning accounted for a larger proportion of the indirect effect of IPT-A on depression than peer interpersonal functioning (62% versus 38%). While important, peer interpersonal functioning does not appear to be as salient to Latino youths' depression as family relationships. Similarly, Way and Robinson (2003) found that family support was more strongly related to changes in self-esteem and depressive symptoms across time than peer support in a predominantly Latino youth sample. Family-related stress also appears to be more strongly associated with Latino youth mental health outcomes than peer-related stress (Zayas et al., 2005). Kobus and Reyes (2000) found that urban Mexican American youth considered family stressors more difficult life events than peer stressors.

Although poor family functioning is a risk factor for suicide among youth in general (Buchman et al., 2014), family conflict may be especially salient to Latino youth given the centrality of the family in Latino culture.

Initial analyses revealed that IPT-A had a small indirect effect (19%) on suicidal ideation in Latino youth. In contrast to depression, the small size of the indirect effect indicates that very little of the impact of IPT-A on suicidal ideation was mediated by family interpersonal functioning. Additionally, after controlling for depressive symptoms across time, this relationship was no longer evident. Most of the benefit of IPT-A for suicidal ideation appears to proceed through a pathway other than interpersonal functioning and there are additional mediators that may further account for intervention effects. Future research should evaluate additional mediators simultaneously in a larger sample. Suicidal ideation is often a symptom of depression, however recent work indicates that regardless of other symptoms, closer examination of the specific mechanisms involved in targeting this deadly symptom are of critical importance (Office of the Surgeon General (US) & National Action Alliance for Suicide Prevention (US), 2012). Studying specific depression symptoms, like suicidal ideation, may enable the development of a personalized prevention intervention that focuses on specific problems and symptoms before they transition into a full-fledged psychiatric illness (Fried & Nesse, 2015). Our results are an initial step in examining the possible mechanisms involved in improvements in suicidal ideation.

The present study has several limitations. The analyses relied predominantly on self-report measures of symptoms rather than clinician-rated measures; participants may have under- or over-reported the severity of their symptoms and problems in interpersonal functioning and there is no basis for comparison. However, self-report questionnaires of depressive symptoms

have been found to be moderately-to-strongly correlated with clinician-rated scales (e.g., Rush et al., 2006; Uher et al., 2012) and previous work using these measures has proven to be clinically impactful (Uher et al., 2012). Another significant limitation is the assessment of suicidal ideation using a single item, making it vulnerable to measurement error. This item provides limited information on the presence of ideation and does not provide information on frequency, intensity and duration. Although item nine from the BDI has been shown to be correlated with the Beck Scale for Suicidal Ideation (Steer et al., 1993), future research should use a more thourough measure of suicidal ideation. The findings are a result of a secondary data analysis of a larger trial evaluating the comparative effectiveness of IPT-A. The current study was not designed to test mediation hypotheses. Examining the association between potential mediators and outcome is an important step in justifying future research in randomized controlled trials (Seidel et al., 2009) and thus these findings will inform future IPT-A research. We were also limited in our analyses by the small sample size. This did not allow for additional variables such as acculturative stress, which has been implicated in Latino youth depression, suicidality, and family conflict (e.g., Pina-Watson et al., 2014). Moreover, the internal consistency of the Friends and Family subscales of the SAS-SR, which were used to assess peer and family interpersonal functioning was low, potentially limiting the robustness of the findings. Future research should examine peer and family interpersonal functioning with a more reliable measure and from multiple perspectives such as youth, parent and teacher. Finally, these data were collected from 1999-2002 and while it is unclear how Latino youth experiences with depression and therapy might have changed since then, these findings should be replicated in a more recent sample.

Despite these limitations, this is one of the first studies to examine the mechanisms through which IPT-A might achieve its effects and provides some support for the theoretical

underpinnings of IPT-A: improving interpersonal functioning leads to improvement in depressive symptoms. Understanding how interventions promote change may serve to improve intervention outcomes by guiding clinicians to the most relevant treatment targets. Our results suggest that treatments aimed at improving family and peer interpersonal functioning reduces depression among depressed Latino youth. Hence, clinicians and researchers interested in effectively treating depressed and suicidal Latino youth should consider including a family and peer component in order to target factors that directly impact upon depression in this high risk population.

References

Alegria, M., Vallas, M., & Pumariega, A. J. (2010). Racial and ethnic disparities in pediatric mental health. *Child and Adolescent Psychiatric Clinics of North America, 19*(4), 759 -774.

Añez, L.M., Paris, Jr., M., Bedregal, L.E., Davidson, L., & Grilo, C.M. (2005). Application of cultural constructs in the care of first generation Latino clients in a community mental health setting. *Journal of Psychiatric Practice, 11*, 221-230.

Beautrais, A. L. (2000). Risk factors for suicide and attempted suicide among young people. *Australian and New Zealand Journal of Psychiatry, 34*(3), 420-436.

Beck, A.T., Steer, R.A., & Garbin, M.G. (1988). Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77-100.

Bernal, G., & Sharrón-del-Río, M.R. (2001). Are empirically supported treatments valid for ethnic minorities? Toward an alternative approach for treatment research. *Cultural Diversity and Ethnic Minority Psychology, 7*(4), 328-342.

Bearman, P. S., & Moody, J. (2004). Suicide and friendships among American adolescents. *American Journal of Public Health*, *94*(1), 89-95.

Bolton, P., Bass, J., Neugebauer, R., Verdeli, H., Clougherty, K. F., Wickramaratne, P., ... & Weissman, M. (2003). Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *JAMA, 289*(23), 3117-3124.

Buchman-Schmitt, J. M., Chiurliza, B., Chu, C., Michaels, M. S., & Thomas, E. J. (2014). Suicidality in adolescent populations: A review of the extant literature through the lens of the interpersonal theory of suicide. *International Journal of Behavioral Consultation and Therapy, 9*(3), 26-34.

Corona, R., Lefkowitz, E. S., Sigman, M., & Romo, L. F. (2005). Latino adolescents' adjustment, maternal depressive symptoms, and the mother-adolescent relationship. *Family Relations, 54*(3), 386-399.

De Luca, S. M., Wyman, P., & Warren, K. (2012). Latina adolescent suicide ideations and attempts: Associations with connectedness to parents, peers, and teachers. *Suicide and Life-Threatening Behavior, 42*(6), 672-683.

Fairchild, A. J., & MacKinnon, D. P. (2009). A general model for testing mediation and moderation effects. *Prevention Science, 10*(2), 87-99.

Feingold, A. (2009). Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods, 14*(1), 43.

Fried, E. I., & Nesse, R. M. (2015). Depression sum-scores don't add up: why analyzing specific depression symptoms is essential. *BMC Medicine, 13*(1), 72.

Huey, S.J., Jr., & Polo, A.J. (2008). Evidence-based psychosocial treatments for ethnic minority youth. *Journal of Clinical Child & Adolescent Psychology, 37*(1), 262-301.

Garcia, C., Skay, C., Sieving, R., Naughton, S., & Bearinger, L. H. (2008). Family and racial factors associated with suicide and emotional distress among Latino students. *Journal of School Health, 78*(9), 487-495.

Goldston, D. B., Molock, S. D., Whitbeck, L. B., Murakami, J. L., Zayas, L. H., & Hall, G. C. N. (2008). Cultural considerations in adolescent suicide prevention and psychosocial treatment. American Psychologist, 63(1), 14.

Hough, R. L., Hazen, A. L., Soriano, F. I., Wood, P., McCabe, K., & Yeh, M. (2002). Mental health care for Latinos: Mental health services for Latino adolescents with psychiatric disorders. *Psychiatric Services, 53*(12), 1556-1562.

Huey, S.J., Jr., & Polo, A.J. (2008). Evidence-based psychosocial treatments for ethnic minority youth. *Journal of Clinical Child & Adolescent Psychology, 37*(1), 262-301.

Kann, L., McManus, T., Harris, W.A., Shanklin, S.L., Flint, K.H., Hawkins, J. ... & Zaza, S. (2016). Youth risk behavior surveillance—United States, 2013. *MMWR Surveill Summ, 65*, 1-174.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3*, 1-27.

Kobus, K., & Reyes, O. (2000). A descriptive study of urban Mexican American adolescents' perceived stress and coping. *Hispanic Journal of Behavioral Sciences, 22*(2), 163-178.

Kuhlberg, J. A., Peña, J. B., & Zayas, L. H. (2010). Familism, parent-adolescent conflict, self-esteem, internalizing behaviors and suicide attempts among adolescent Latinas. *Child Psychiatry & Human Development, 41*(4), 425-440.

Lemmens, L.H.J.M., Mueller, V.N.L.S., Arntz, A., & Huibers, M.J.H. (2016). Mechanisms of change in psychotherapy for depression: An empirical update and evaluation of research aimed at identifying psychological mediators. *Clinical Psychology Review, 50*, 95-107.

McNeilly, C. L., & Howard, K. I. (1991). The Therapeutic Procedures Inventory: Psychometric properties and relationship to phase of treatment. *Journal of Psychotherapy Integration, 1*(3), 223-234.

Mufson, L., Dorta, K. P., Moreau, D., & Weissman, M. M. (2004). *Interpersonal psychotherapy for depressed adolescents* (2nd ed.). New York, NY: Guilford Press.

Mufson, L., Dorta, K. P., Wickramaratne, P., Nomura, Y., Olfson, M., & Weissman, M. M. (2004). A randomized effectiveness trial of interpersonal psychotherapy for depressed adolescents. *Archives of General Psychiatry, 61*(6), 577-584.

Mufson, L., Weissman, M. M., Moreau, D., & Garfinkel, R. (1999). Efficacy of interpersonal psychotherapy for depressed adolescents. *Archives of General Psychiatry, 56*(6), 573-57

Mufson, L., Yanes-Lukin, P., Gunlicks-Stoessel, M., & Wickramaratne, P. (2014). Cultural Competency and Its Effect on Treatment Outcome of IPT-A in School-Based Health Clinics. *American Journal of Psychotherapy, 68*(4), 417-442.

Office of the Surgeon General (US) and National Action Alliance for Suicide Prevention (US). (2012). *2012 National Strategy for Suicide Prevention: Goals and Objectives for Action: A Report of the US Surgeon General and of the National Action Alliance for Suicide Prevention*. Retrieved from http://www.surgeongeneral.gov/library/ reports/ national-strategy-suicide-prevention/full-report.pdf

Peña, J. B., Kuhlberg, J. A., Zayas, L. H., Baumann, A. A., Gulbas, L., Hausmann-Stabile, C., & Nolle, A. P. (2011). Familism, family environment, and suicide attempts among Latina youth. *Suicide and Life-Threatening Behavior, 41*(3), 330-341.

Piña-Watson, B., Castillo, L. G., Rodriguez, K. M., & Ray, S. (2014). Familial factors related to suicidal ideation of Latina adolescents in the United States. *Archives of Suicide Research, 18*(2), 213-220.

Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: quantitative strategies for communicating indirect effects. *Psychological Methods*, *16*(2), 93.

Potochnick, S. R., & Perreira, K. M. (2010). Depression and anxiety among first-generation immigrant Latino youth: key correlates and implications for future research. *The Journal of Nervous and Mental Disease, 198*(7), 470.

Prinstein, M. J., Boergers, J., Spirito, A., Little, T. D., & Grapentine, W. L. (2000). Peer functioning, family dysfunction, and psychological symptoms in a risk factor model for adolescent inpatients' suicidal ideation severity. *Journal of Clinical Child Psychology, 29*(3), 392-405.

Raudenbush, S.W., Bryk, A.S, & Congdon, R. (2004). *HLM 6 for Windows* [Computer software]. Skokie, IL: Scientific Software International, Inc.

Reyes, J. A., & Elias, M. J. (2011). Fostering social–emotional resilience among Latino youth. *Psychology in the Schools*, *48*(7), 723-737.

Rosselló, J., & Bernal, G. (1999). The efficacy of cognitive-behavioral and interpersonal treatments for depression in Puerto Rican adolescents. *Journal of Consulting and Clinical Psychology, 67*(5), 734.

Rush, A. J., Carmody, T. J., Ibrahim, H. M., Trivedi, M. H., Biggs, M. M., Shores-Wilson, K., ... & Kashner, T. M. (2006). Comparison of self-report and clinician ratings on two inventories of depressive symptomatology. *Psychiatric Services, 57*(6), 829-837.

Seidel, A., Presnell, K., & Rosenfield, D. (2009). Mediators in the dissonance eating disorder prevention program. *Behaviour Research and Therapy*, *47*(8), 645-653.

Selig, J. P., & Preacher, K. J. (2008). Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects [Computer software].

Shaffer, D., Gould, M. S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H., & Aluwahlia, S. (1983). A children's global assessment scale (CGAS). *Archives of General psychiatry*, *40*(11), 1228-1231.

Sheeber, L., Hops, H., Alpert, A., Davis, B., & Andrews, J. (1997). Family support and conflict: Prospective relations to adolescent depression. *Journal of Abnormal Child Psychology, 25*(4), 333-344.

Steer, R.A., Kumar, G., & Beck, A.T. (1993). Self-reported suicidal ideation in adolescent psychiatric inpatients. *Journal of Consulting and Clinical Psychology, 61*(6), 1096-1099.

Tang, T. C., Jou, S. H., Ko, C. H., Huang, S. Y., & Yen, C. F. (2009). Randomized study of school-based intensive interpersonal psychotherapy for depressed adolescents with suicidal risk and parasuicide behaviors. *Psychiatry and Clinical Neurosciences, 63*(4), 463-470.

Uher, R., Perlis, R. H., Placentino, A., Dernovšek, M. Z., Henigsberg, N., Mors, O., ... & Farmer, A. (2012). Self-report and clinician-rated measures of depression severity: can one replace the other?. *Depression and Anxiety, 29*(12), 1043-1049.

Way, N., Cowal, K., Gingold, R., Pahl, K., & Bissessar, N. (2001). Friendship patterns among African American, Asian American, and Latino adolescents from low-income families. *Journal of Social and Personal Relationships, 18*(1), 29-53.

Way, N., & Robinson, M. G. (2003). A longitudinal study of the effects of family, friends, and school experiences on the psychological adjustment of ethnic minority, low-SES adolescents. *Journal of Adolescent Research, 18*(4), 324-346.

Weissman, M. M., & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of General Psychiatry, 33*(9), 1111-1115.

Williams, J. B. (1988). A structured interview guide for the Hamilton Depression Rating Scale. *Archives of General Psychiatry, 45*(8), 742-747.

Winterrowd, E., Canetto, S. S., & Chavez, E. L. (2011). Friendship factors and suicidality: common and unique patterns in Mexican American and European American youth. *Suicide and Life-Threatening Behavior, 41*(1), 50-65.

Zayas, L. H., Hausmann-Stabile, C., & Kuhlberg, J. (2011). Can Better Mother-Daughter Relations Reduce the Chance of a Suicide Attempt among Latinas? *Depression Research and Treatment, 2011*.

Zayas, L. H., Lester, R. J., Cabassa, L. J., & Fortuna, L. R. (2005). Why do so many Latina teens attempt suicide? A conceptual model for research. *American Journal of Orthopsychiatry, 75*(2), 275-287.

Zayas, L. H., & Pilat, A. M. (2008). Suicidal behavior in Latinas: Explanatory cultural factors and implications for intervention. *Suicide and Life-Threatening Behavior, 38*(3), 334-342.

Table 1. Means and Standard Deviations for Outcomes and Mediators by Treatment Group

| | IPT-A (*n*=28) | TAU (*n*=22) |
|---|---|---|
| *Variable* | Mean (*SD*) | Mean (*SD*) |
| *Depression (BDI)* | | |
| Baseline | 20.82 (9.63) | 21.86 (9.14) |
| Week 4 | 14.80 (8.77) | 16.14 (9.04) |
| Week 8 | 7.52 (8.18) | 14.33 (9.48) |
| Week 12 | 5.76 (8.43) | 12.38 (10.05) |
| *Suicidal Ideation* | | |
| Baseline | 0.57 (0.50) | 0.23 (0.43) |
| Week 4 | 0.16 (0.37) | 0.27 (0.46) |
| Week 8 | 0.08 (0.28) | 0.29 (0.46) |
| Week 12 | 0.12 (0.33) | 0.14 (0.36) |
| *Peer Interpersonal Functioning* | | |
| Baseline | 2.84 (0.61) | 2.83 (0.63) |
| Week 4 | 2.65 (0.69) | 2.71 (0.85) |
| Week 8 | 2.52 (0.74) | 2.83 (0.81) |
| Week 12 | 2.06 (0.63) | 2.50 (0.90) |
| *Family Interpersonal Functioning* | | |
| Baseline | 2.65 (0.78) | 2.43 (0.78) |
| Week 4 | 2.51 (0.71) | 2.47 (0.81) |
| Week 8 | 2.13 (0.75) | 2.28 (0.71) |
| Week 12 | 1.76 (0.71) | 2.09 (0.82) |

Table 2. Parameters for Time x Treatment Group Interaction Predicting Suicidal Ideation and Peer and Family Interpersonal Functioning Change Over 12 Sessions of Treatment

| Outcome: Depression | | | |
|---|---|---|---|
| Predictor | Estimate | *SE* | *t* ratio |
| Intercept, $\gamma_{00}$ | 20.72 | 1.93 | 10.73*** |
| Treatment Group, $\gamma_{01}$ | -0.56 | 2.58 | -0.22 |
| Linear Change (Time), $\gamma_{10}$ | -2.99 | 0.78 | -3.81*** |
| Time x Treatment Group, $\gamma_{11}$ | -2.28 | 1.09 | -2.10* |
| **Outcome: Suicidal Ideation** | | | |
| Predictor | Estimate | OR | 95 % CI |
| Intercept, $\gamma_{00}$ | -1.06 | 0.345 | (0.12, 1.01) |
| Treatment Group, $\gamma_{01}$ | 1.07 | 2.91 | (0.80, 10.60) |
| Linear Change (Time), $\gamma_{10}$ | -0.20 | 0.82 | (0.53, 1.27) |
| Time x Treatment Group, $\gamma_{11}$ | -0.93 | 0.40* | (0.17, 0.95) |
| **Outcome: Peer Interpersonal Functioning** | | | |
| Predictor | Estimate | *SE* | *t* ratio |
| Intercept, $\gamma_{00}$ | 2.85 | 0.13 | 22.07*** |
| Treatment Group, $\gamma_{01}$ | 0.04 | 0.17 | 0.21 |
| Linear Change (Time), $\gamma_{10}$ | -0.09 | 0.06 | -1.38 |
| Time x Treatment Group, $\gamma_{11}$ | -0.16 | 0.08 | -2.03* |
| **Outcome: Family Interpersonal Functioning** | | | |
| Predictor | Estimate | *SE* | *t* ratio |
| Intercept, $\gamma_{00}$ | 2.50 | 0.16 | 15.62*** |

| | | | |
|---|---|---|---|
| Treatment Group, $\gamma_{01}$ | 0.21 | 0.21 | 0.97 |
| Linear Change (Time), $\gamma_{10}$ | -0.12 | 0.06 | -1.98 |
| Time x Treatment Group, $\gamma_{11}$ | -0.18 | 0.09 | -2.16* |

Note: *$p < .05$, ** $p < .01$, ***$p < .001$. CI = Confidence Interval.

Table 3. Unstandardized Indirect Effects of the Time x Treatment Group Interaction on Depression and Suicidal Ideation Through Peer and Family Interpersonal Functioning

| Predictor | Mediator | Outcome | *a* path | *b* path | *c* path | *c′* path | *ab* | 95% CI *ab* | $P_M$ |
|---|---|---|---|---|---|---|---|---|---|
| Time x Group | Peer Functioning | Depression | -0.16* | 3.99*** | -2.28* | -1.71 | -0.64* | [-1.39, -0.04] | 0.27 |
| Time x Group | Family Functioning | Depression | -0.18* | 6.00*** | -2.28* | -0.71 | -1.11* | [-2.22, -0.10] | 0.61 |
| Time x Group | Peer Functioning | Suicidal Ideation | -0.16* | 0.49 | -0.93* | -0.95* | -0.08 | [-0.23, 0.02] | 0.08 |
| Time x Group | Family Functioning | Suicidal Ideation | -0.18* | 1.09** | -0.93* | -0.86 | -0.20* | [-0.45, -0.01] | 0.19 |

Note. The *a* path is the path from predictor to mediator. The *b* path is the path from the mediator to the outcome. The *c* path is total effect, and is the path from predictor to the outcome before controlling for the mediator. The *c′* path is the path from predictor to outcome after controlling for the mediator. The 95% confidence interval (CI) of *ab* was calculated with a Monte Carlo method with 20,000 resamples. $P_M$ is a measure of effect size that represents a ratio of the indirect effect to the direct effect; it was calculated by ab/(ab+ *c′*). The mediators (Peer and Family Interpersonal Functioning) were entered as a Level 1 time-varying covariates.

*$p < .05$, ** $p < .01$, ***$p < .001$.

Table 4. Unstandardized Indirect Effects of the Time x Treatment Group Interaction on Depression Through Peer and Family Interpersonal Functioning Examined Simultaneously

| Predictor | Mediator | Outcome | *a* path | *b* path | *c* path | *c′* path | *ab* | 95% CI *ab* | $P_M$ |
|---|---|---|---|---|---|---|---|---|---|
| Time x Group | Peer Functioning | Depression | -0.16* | 2.28*** | -2.28* | -0.60 | -0.36* | [-0.88, -0.004] | 0.38 |
| Time x Group | Family Functioning | Depression | -0.18* | 5.17*** | -2.28* | -0.60 | -0.96* | [-1.92, -0.08] | 0.62 |

Note. The *a* path is the path from predictor to mediator. The *b* path is the path from the mediator to the outcome. The *c* path is total effect, and is the path from predictor to the outcome before controlling for the mediator. The *c′* path is the path from predictor to outcome after controlling for the mediator. The 95% confidence interval (CI) of *ab* was calculated with a Monte Carlo method with 20,000 resamples. $P_M$ is a measure of effect size that represents a ratio of the indirect effect to the direct effect; it was calculated by ab/(ab+ *c′*). The mediators (Peer and Family Interpersonal Functioning) were entered as a Level 1 time-varying covariates.

*$p < .05$, ** $p < .01$, ***$p < .001$.