



Reconnecting Homeless Adolescents and Their Families: Correlates of Participation in a Family Intervention

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Abstract

Behavioral family interventions are an effective way to intervene to prevent negative developmental outcomes for adolescents. Participation in family interventions encompasses behavioral and cognitive/attitudinal dimensions, among others, indicated by retention and engagement, respectively. Two dimensions of participation, retention and engagement, in a family intervention were examined in a sample of newly homeless adolescents and their parents or guardians. Correlates of participation included parents with more income and less perceived family conflict and adolescents with higher endorsement of depression, anxiety, somatization, obsessive-compulsive, phobic, and psychotic symptoms on the Brief Symptom Inventory (BSI). Stronger therapeutic alliance was correlated with being more distressed (i.e., lower income, more hostility), being a female adolescent participant, and having greater comfort discussing sex with parents. Furthermore, parents and adolescents with greater distress and thus greater need were more apt to finish the intervention. The finding that families who were experiencing more distress had higher alliance scores suggests that there is an additional need for development of interventions for families in crisis. Both participant and provider perceptions are also important in development of a strong therapeutic alliance. This study's findings have implications for further exploration of the development of cultural humility and improving mental health literacy among facilitators of behavioral interventions.

Keywords Homeless adolescents · Youth high-risk behaviors · Family conflict · Family interventions · Intervention engagement

There is a large unmet need for family interventions for homeless adolescents. Family interventions with homeless adolescents are, however, a relatively unexplored area (Pergamit et al. 2016) even though their family relationships are often characterized by conflict, inappropriate problem-solving and poor communication (Tyler and Schmitz 2013). While

research demonstrates that newly homeless adolescents will return home (Milburn et al. 2007), those who have more troubled relationships with their parents have a more difficult time remaining at home (Milburn et al. 2009). Getting homeless adolescents and their families to participate in family interventions, crucial for intervention effectiveness, is a known challenge (Spoth and Redmond 2000), especially for at-risk adolescents (e.g., Rotheram-Borus et al. 2002) that often have low completion rates (Milburn and Lightfoot 2016). This may be due to barriers to participating in terms of access, relevance, and time commitment (Coatsworth et al. 2018). One strategy often used for increasing access for these challenged families is to provide family interventions during key life transitions for adolescents when families naturally partake in their children's activities (e.g., graduation) and, thus, might be receptive to participating in an intervention that could help with the transition (Coatsworth et al. 2006). For homeless adolescents, a key life transition time may be when they first leave home, are newly homeless, and may want to reconnect via a family intervention. The success of this strategy, however, has been limited for homeless adolescents (Coatsworth et al. 2006).

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The importance and challenges of participation in interventions have been highlighted as key area for further research in type 2 translation research to implement and scale up evidence-based interventions by Spoth et al. (2013). Identifying the “key factors” and “best strategies for enhancing participation” are critical to the implementation phase of their Translation Science to Population Impact (TSci Impact) Framework (Spoth et al. 2013, p. 325). Mauricio et al. (2018) have applied the TSci Impact Framework specifically to family interventions to highlight areas for further research. These included the need to have consistent definitions of participation and to define participation in terms of both behavioral and attitudinal/cognitive dimensions. This work provides an overarching frame for our examination of participation in a family intervention for homeless adolescents. Retention, as indicated by attendance over time, is one aspect of the behavioral dimension (e.g., Murry et al. 2018), while treatment satisfaction is one attitudinal/cognitive dimension of engagement (Coatsworth et al. 2018; Mauricio et al. 2018).

Like other studies of intervention implementation, retention, the behavioral dimension, was operationalized as the completion of a substantial portion of the intervention (Ingoldsby 2010). Engagement, the attitudinal/cognitive dimension, was operationalized as satisfaction with the therapeutic alliance between the families and the intervention facilitators—it is treatment satisfaction (Mauricio et al. 2018). A personal bond with a treatment provider positively impacts family engagement in therapeutic interventions (e.g., Elvins and Green 2008; Thompson et al. 2007). Staudt (2007) proposed a framework for thinking about family engagement that is closely aligned with the conceptual framework of Mauricio et al. (2018) (i.e., in-session engagement) in that it takes into account the attitudinal component of engagement, in addition to the behavior of the facilitator. The attitudinal component of engagement is related to five dimensions: intervention relevance and acceptability, daily stresses, external barriers to the intervention, cognitions about the intervention, and the therapeutic alliance. We focus on one of these dimensions, the therapeutic alliance, because this dimension is an indicator of a personal bond between the facilitator and family (Coatsworth et al. 2018).

Many studies assert that better retention is associated with demographics such as higher levels of income and educational attainment, family characteristics such as having more family stress, and intervention characteristics such as trust (Coatsworth et al. 2006; Winslow et al. 2009); however, findings are mixed, and evidence is still emerging relevant to culturally humble ways of engaging participants (e.g., Murry et al. 2018). Engagement has been associated with demographics such as higher levels of educational attainment and family characteristics such as parental involvement (Coatsworth et al. 2018). Interventions having project goals that are consistent with the goals of the parent/adolescent are

also linked to better retention (Winslow et al. 2009). While previous research has emphasized the importance of addressing how to best engage and retain participants in interventions to reach more families and have more widespread intervention uptake, more research defining and examining contextual factors related to participation is needed (Mauricio et al. 2018; Milburn and Lightfoot 2016). Specifically, given high levels of current mental and behavioral problems among homeless adolescents—identified as potential barriers to participation—and further understanding how these issues as well as their readiness to change might relate to program participation would be informative.

Furthermore, research on how to increase participation in family interventions has often only examined one dimension of participation (see Milburn and Lightfoot 2016 for a review), and many studies have focused on the behavioral dimension (Mauricio et al. 2018). In this manuscript, we examine the association of demographic, family, and intervention characteristics with two dimensions of participation, retention and treatment satisfaction, in a sample of participants in STRIVE (Support To Reunite, Involve, and Value Each other), a family intervention for homeless adolescents and their parents or guardians that has been found to be efficacious in reducing delinquent behaviors, substance use, and sexual risk-taking behaviors (Milburn et al. 2012). We explore how individual characteristics of parents and adolescents (e.g., demographic characteristics, mental health, substance use, readiness to change behaviors as well as sexual practices/behaviors of adolescents) and family characteristics (e.g., family functioning, attachment/bonding, and parenting practices) relate to the retention and treatment satisfaction of homeless adolescents and their parents or guardians in STRIVE. Directional hypotheses were not made for how these individual and family characteristics would be associated with retention and treatment satisfaction. Our goal is to begin to identify how these factors relate to participation in this underserved population to gain a better understanding of how to better implement family interventions with populations that are not often provided evidence-based family interventions (Spoth et al. 2013).

Method

Procedure

From March 2006 to June 2009, newly homeless adolescents and their parents or guardians (e.g., foster parents, grandparents), who will be referred to as parents going forward, were recruited from homeless adolescent-serving, community-based organizations and from direct recruitment in Los Angeles and San Bernardino Counties to participate in a randomized controlled trial of STRIVE. STRIVE is a brief five session psychoeducational intervention administered to the

adolescents and parent(s) together to improve families' problem-solving, emotional regulation, and conflict resolution skills. Eligibility criteria were that adolescents were 12 to 17 years old, were away from home (e.g., in a shelter, hotel, on the street, or staying with someone other than their parent(s)) for at least two nights in the past 6 months, were not away from home for more than 6 months, and were at a transition point to reconnect with family (i.e., had a parent who was willing to reunify with the adolescent). In addition, no current abuse or neglect, no active psychosis, or no current substance intoxication (e.g., not impaired by alcohol and/or other drug use) could be present. These additional criteria were screened for after informed consent was given during a baseline assessment. Written informed consent/assent to participate was obtained from both parents and adolescents in the study. The Institutional Review Board of the University of California at Los Angeles (UCLA) approved the protocol for this study.

After the adolescent and parent assented/consented, they completed baseline, 3, 6, and 12 months follow-up assessments. The face-to-face computerized assessments were conducted by a highly trained and ethnically/racially diverse assessment team. Audio computer-assisted self-interviewing (ACASI) was used for sensitive measures (i.e., drug and alcohol use). Eligible families ($n = 151$) were randomly assigned to either an intervention ($n = 68$) or control group ($n = 83$). Further details on the study design and intervention may be found in Milburn et al. (2012). This manuscript focuses on the baseline responses as they relate to attendance at intervention sessions that were scheduled to take place between the baseline and the 3 months follow-up assessment. Therefore, analyses are conducted on baseline data from the 68 adolescents and parents who were randomized to the intervention condition.

Sample

Parents Of the 68 parents in the intervention arm of the study, 88% were female ($n = 60$), and the average age was 41 years (range, 23 to 65). Fifty-seven percent reported their race/ethnicity as Hispanic ($n = 39$), 21% as Black/African American ($n = 14$), and 21% as White/European American ($n = 14$). Among the Hispanic parents, 41% were Mexican American ($n = 28$). Sixty-three percent reported being born in the USA, and 60% reported their primary language to be English, followed by Spanish (38%). Parents who reported not being born in the USA reported living in the USA for 21 years on average (range, 6 to 38 years). Parents received a mean of 13 years of education (range, 4 to 17 years). Fifty-one percent of parents reported previous year total income of less than \$25,000, and 63% were currently employed. The majority of parents were either the mother (79%), father (10%), or grandparent (6%) of the adolescent in the study. Seventy-eight percent of parents reported their child to currently be living at home, and 4% reported in a shelter.

Adolescents Of the 68 adolescents in the intervention arm, 78% were female ($n = 53$), and the average age was 15 years (range, 12 to 17). Sixty-two percent of adolescents reported their race/ethnicity as Hispanic, 16% as Black/African American, and 10% as White/European American. Ninety-one percent of adolescents were born in the USA, and 87% were primarily English-speaking. Sixty-eight percent of adolescents had consumed alcohol in their lifetime, 56% had used marijuana, and 26.5% had used any illicit substances other than marijuana (hard drugs). Rates were lower for use in the past 3 months: alcohol (43%), marijuana (44%), and hard drugs (16%). Analyses of substance use focus on alcohol, marijuana, and hard drugs, due to low reported numbers of use of individual substances other than marijuana. Table 1 summarizes both parent and adolescent demographics.

Measures

Measures reported by both parents and adolescents, by parents only, and by adolescents only are summarized below. Further details on measures are found in supplementary Table S1 (available online), including the number of items, Cronbach's alphas, reporter, and scale ranges.

Parent and Adolescent Report

Demographics Demographic characteristics included age, gender, race/ethnicity, and primary language. Parent demographic characteristics also included Mexican versus non-Mexican Latino ethnicity, marital status, household income in the previous year, amount of money received in the previous month from all sources, highest grade/year of education completed, being born in the USA, number of years living in the USA, being currently employed, parent's relationship to the child (e.g., if they were the biological parent), and whether the adolescent in the study was living with a biological parent. Household income was categorized into \$5000 increments and treated as a Likert scale, e.g., "less than \$5,000" (1), "\$5000–9999" (2), "\$35,000–39,999" (8), and "\$40,000 and over" (9). Adolescent demographic characteristics also included sexual orientation.

Mental Health The Brief Symptom Inventory (BSI; Derogatis 1993) assessed parent and adolescent mental health symptoms during the previous week. A global summary measure of distress was calculated along with nine subscales for symptoms of depression, anxiety, somatization, interpersonal sensitivity, obsessive-compulsive, hostility, phobic anxiety, paranoid ideation, and psychoticism. In addition, a binary caseness variable was calculated that provided a clinical cutoff level based on the global summary measure and the nine subscales as outlined in the BSI scoring manual.

Table 1 Parent and adolescent demographics

	Parents (<i>N</i> = 68)		Adolescents (<i>N</i> = 68)	
	Mean	<i>SD</i>	Mean	<i>SD</i>
Demographics				
Age	41.1	7.6	14.73	1.33
Male gender, % (<i>n</i>)	11.8%	8	22.1%	15
Married, % (<i>n</i>)	39.7%	27	n/a	n/a
Race/ethnicity, % (<i>n</i>)				
Hispanic	57.4%	39	61.8%	42
Black/African American	20.6%	14	16.2%	11
White/European American	20.6%	14	10.3%	7
Other, mixed race	1.5%	1	11.8%	8
Primary language, % (<i>n</i>)				
English	60.3%	41	86.8%	59
Spanish	38.2%	26	11.8%	8
Other	1.5%	1	1.5%	1
Born in the USA, % (<i>n</i>)	63.2%	43	91.2%	62
Years in the USA	20.8	8.5	n/a	n/a
Highest year of education	13.0	3.3	n/a	n/a
Currently employed, % (<i>n</i>)	63.2%	43	n/a	n/a
Yearly income, Likert scale	5.4	3.0	n/a	n/a
Child living w/ biol family, % (<i>n</i>)	77.9%	53	n/a	n/a
Relationship to adolescent in study				
Mother	79.4%	54	n/a	n/a
Father	10.3%	7	n/a	n/a
Grandparent	5.9%	4	n/a	n/a
Other	4.4%	3	n/a	n/a
Sexual orientation				
Bisexual	n/a	n/a	11.8%	8
Heterosexual	n/a	n/a	88.2%	60
Substance use, lifetime				
Alcohol	n/a	n/a	67.7%	46
Marijuana	n/a	n/a	55.9%	38
Other Drugs	n/a	n/a	26.5%	18
Substance use, last 3 months				
Alcohol	n/a	n/a	43.3%	29
Marijuana	n/a	n/a	44.1%	30
Other Drugs	n/a	n/a	16.2%	11

Family Functioning The family functioning scale (Bloom 1985) measured parents' and adolescents' perception of their family's functioning across seven different constructs: cohesion, expressiveness, disengagement, democratic family style, laissez-faire family style, authoritarian family style, and conflict. We adapted the original response scale labels "Strongly agree" to "Strongly disagree" to read as "Very true for my family" to "Very untrue for my family."

Readiness for Change The University of Rhode Island Change Assessment (URICA; McConaughy et al. 1983) assessed

parents' and adolescents' readiness for change through four subscales: pre-contemplation, contemplation, action, and maintenance. Readiness was computed by summing the last three subscales scores and subtracting the pre-contemplation subscale score. Both the full readiness scale and subscales were examined to assess whether specific stage of readiness might be related to participation.

Substance Use The Short Michigan Alcohol Screening Test (SMAST; Selzer et al. 1975) ascertained alcohol use and abuse among parents. Problematic alcohol use was identified

in one of the following three ways. Participants indicating lifetime alcohol abstinence were not administered the SMAST and classified as not engaging in problematic alcohol use. Participants who gave a “no” response to the first SMAST item, “Do you feel that you are a normal drinker?”, were classified as engaging in problematic alcohol use. Participants who indicated being a normal drinker were further queried on 12 yes-no (1–0) indicator items assessing feeling and actions related to drinking. Participants with a total score of 3 or more were also classified as problematic alcohol users as suggested by Selzer et al. (1975).

The adolescent version of the Michigan Alcohol Screening Test (MAST; Selzer 1971) was administered to adolescents. The last two items were modified and queried individuals on whether they had ever been “arrested or gotten a ticket when you have been drinking (for anything other than a DUI)” and arrested for “drunk driving.” Follow-up questions on the number of arrests were not administered. A yes-no indicator variable was created to identify borderline problematic alcohol use. Participants who indicated lifetime alcohol abstinence were not administered the MAST and were classified as not engaging in problematic alcohol use. Individual MAST items were weighted and summed based on scoring guidelines. Participants with a total score of five or more were identified as problematic alcohol users based on guidelines suggested by Selzer et al. (1975).

The Drug Abuse Screening Test (DAST; Skinner 1982) ascertained drug use and abuse among parents through items assessing feelings and actions related to substance use. Following diagnostic validity statistics and recommendations presented in Gavin et al. (1989), the presence of a substance use disorder was identified by a score of six or more. The adolescent DAST (DAST-A; Martino et al. 2000) ascertained drug use and abuse among adolescents in a similar manner.

The AIDS Risk Behavior Assessment (ARBA; Donenberg et al. 2001) assessed alcohol and drug use among adolescents over their lifetime and the past 3 months, frequency of use in the past 3 months, and method of use. As a supplement to the DAST, the ARBA explicitly asks about the following substances: alcohol, marijuana, cocaine or crack, amphetamines, ice (smokable speed), heroin, a mixture of heroin and cocaine, a mixture of heroin and speed, non-prescription methadone, and other opiates. As in Milburn et al. (2012), we created yes-no composite indexes of “hard drug use” for lifetime and past 3-month use of any substance other than marijuana.

Comfort Discussing Sexual and Reproductive Health Teaming African American Parents with Survival Skills (TAAPSS; Bray and Pequegnat 2012) measured the degree to which a parent was comfortable discussing risk behaviors for sexually transmitted infections, including HIV/AIDS, with their child. Three summary subscales were covered: (1) ever talking with one’s child about sex; (2) talking with one’s child about sex

currently or in the past 3 months; and (3) talking with one’s child in general about topics that include sexuality, reproduction, alcohol, and drug use in the past 3 months. The TAAPSS also included 11 yes-no questions for adolescents on whether their guardian discussed sexual behavior, alcohol, and drug use with them in the past 3 months. Items were summed.

Retention and Engagement Retention, defined as completion of the intervention sessions by parents and their adolescent children, was ascertained by session attendance. Most parents and their adolescents (76%; $n = 52$ of 68 parent-adolescent pairs) attended all of the five possible sessions. Remaining parents and their adolescents attended zero to one session ($n = 2$), two sessions ($n = 10$), three sessions ($n = 3$), or four sessions ($n = 1$). Hence, we created a binary outcome for attendance, classified as having attended all five sessions versus fewer than five sessions. Engagement, defined as satisfaction with the therapeutic alliance, was assessed by the Working Alliance Inventory, Short Form (WAI; Busseri and Tyler 2003). A higher WAI summary score indicates a better working relationship and trust between facilitator and participant. Scores were reported for facilitators ($n = 38$) and participants ($n = 40$, for parents and adolescents, respectively). Correlation between facilitator and participant scores was low for parents ($r = .31$) and moderately high for adolescents ($r = .75$). On average, parent-reported scores were 3 points higher than facilitator reported scores (paired $t = 2.35$, $df = 36$, $p = .03$); adolescent and facilitator-reported scores did not differ significantly.

Parent Report

The Conflict Tactics Scales, Form A (Strauss 1979) ascertained the frequency of parent conflict with the adolescent over the past 3 months or currently across three scales: reasoning, verbal aggression, and physical violence. The Parker’s Parental Bonding Instrument (Parker et al. 1979) assessed parent perception of the degree of bonding between adolescent and parent across two subscales, care and protection. The Adult Attachment Scale (Collins and Read 1990) ascertained adult attachment styles and closeness of relations with partners and other individuals across three subscales: difficulty in depending on others and anxiety and discomfort in closeness to others. Higher scores represent less secure attachment.

Adolescent Report

Emotional Regulation The Difficulties in Emotion Regulation Scale (Gratz and Roemer 2004) measured components of emotional regulation among adolescents and was analyzed as a summary measure of the first 14 items from the original 36-item scale.

Trauma The adolescent version of the UCLA Posttraumatic Stress Disorder (PTSD) Reaction Index (UCLA PTSD-RI) for DSM-IV (Steinberg et al. 2004) assessed adolescents' exposure to traumatic events (criterion A), symptoms of PTSD (criteria B, C, D), and DSM-IV PTSD diagnostic criteria. Criteria B, C, and D represent re-experiencing, avoidance, and increased arousal symptoms, respectively. Items are scored from 0 (None) to 4 (Most). Based on the UCLA PTSD-RI manual, responses of 2 (Some) or higher indicate the presence of symptoms for individual items. Partial PTSD is considered likely if criterion A is met along with any two of criteria B, C, or D. Full PTSD requires all criteria to be met.

Sexual Behavior The ARBA also assessed sexual behavior among adolescents, including lifetime participation in anal or vaginal sex, number of anal or vaginal sex acts during the past 3 months, and condom usage during sex in the past 3 months. We analyzed the average of Likert-scale scores for condom usage during anal and vaginal sex.

Data Analysis

Primary analyses compared parents and adolescents by retention items (attending all five sessions versus fewer than five sessions) and engagement items (facilitator and participant WAI scores) on demographics, mental health factors, perceptions of family functioning, attachment/bonding, parenting practices, substance use, adolescent sexual practices/behaviors, and readiness to change behaviors. *t* tests were conducted to compare Likert-scaled measures that were appropriately treated as continuous variables by session attendance groups; the Satterthwaite adjustment was applied if diagnostic tests indicated unequal variances across groups. Since the WAI scores were continuous, we used a different analytic approach to examine potential correlates. Categorical measures, which mainly consisted of demographic characteristics, were treated as covariates of WAI scores in linear regression models. We examined Pearson correlation coefficients between measures that were appropriately treated as continuous measures and WAI scores. We report *t*-statistics or chi-square statistics, degrees of freedom (*df*), and *p* values. Each of the three parental retention items—session attendance, facilitator, and participant WAI scores—was compared across 49 measures. Similarly, each of the three adolescent retention items was compared across 41 measures. In addition to the standard .05 alpha level, statistical significance is discussed in terms of the Holm-Bonferroni adjustment (Holm 1979) to give context to the large number of comparisons and type I error rates. For each retention item, comparisons were ranked by their *p* values. The alpha level for the smallest *p* value was calculated as $.05/(n - 1 + 1)$, the alpha level for the next smallest *p* value was calculated as $.05/(n - 2 + 1)$, and so forth, where *n* is the number of comparisons. For parents and adolescents, the

smallest *p* values needed to be less than alpha levels of approximately .0010 and .0012, respectively. We report mean differences (MD) between session attendance groups in terms of standardized effect sizes (ES) where SD is the pooled standard deviation between groups, $ES = MD/SD$. Following Cohen's rules of thumb, ES of .1, .3, and .5 are considered to be small, medium, and large, respectively (Cohen 1992).

Results

Retention and Engagement Outcome Analyses

Parents Table 2 shows all of the parent demographic characteristics and remaining measures (mental health, family, and alcohol and drug measures) that differed significantly by session attendance. Parents attending all five sessions versus fewer sessions reported a higher household income (Wilcoxon test, $p = .03$), less conflict-related reasoning on the Conflict Tactics Scale ($t = -2.11$, $df = 66$, $p = .04$), and higher anxiety on the Adult Attachment Scale, on average ($t = 2.05$, $df = 66$, $p = .04$).

Next we report relationships between WAI scores and parent measures, with significant findings summarized in Table 3. Higher facilitator-reported WAI scores were associated with a higher likelihood of reporting White/European American race/ethnicity versus other racial/ethnic groups ($t = 2.44$, $df = 36$, $p = .02$), less education ($r = -.38$, $p = .02$), a lower Adult Attachment closeness score ($r = -.36$, $p = .03$), and fewer mental health symptoms on the BSI global distress index ($r = -.32$, $p = .047$) and on the somatic ($r = -.32$, $p = .048$), phobia ($r = -.42$, $p < .01$), and psychoticism ($r = -.45$, $p < .01$) subscales.

Higher participant-reported WAI scores were associated with a higher likelihood to be female ($t = 2.19$, $df = 38$, $p = .03$) and Mexican ($t = 2.46$, $df = 37$, $p = .02$) versus non-Mexican Hispanic ethnicity; participant-reported WAI scores did not significantly differ between non-Hispanic and Hispanic ethnicity. Furthermore, higher participant-reported WAI scores were associated with receiving less money last month ($r = -.51$, $p < .01$) and increased levels of hostility on the BSI ($r = .33$, $p = .04$). No other significant differences were found for parent demographics, mental health, sexual behavior, and substance use in comparisons with session attendance and WAI scores. Based on the Holm-Bonferroni adjustment, none of the parent results were statistically significant.

Adolescents Table 4 shows all of the adolescent demographic characteristics and remaining measures that differed significantly by session attendance. Adolescents attending all five sessions versus fewer sessions reported more mental health symptoms on the BSI, both on the global distress index

Table 2 Parent demographics and family measures that were significantly different by session attendance out of 5 possible sessions

	All 5 sessions (<i>N</i> = 52)		< 5 sessions (<i>N</i> = 16)		<i>ES</i> ^a
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Demographics					
Age	41.1	7.7	41.0	7.7	0.01
Male gender, % (<i>n</i>)	13%	7	6%	1	
Married, % (<i>n</i>)	40%	21	38%	6	
Race/ethnicity, % (<i>n</i>)					
Hispanic	60%	31	50%	8	
Black/African American	21%	11	19%	3	
White/European American	17%	9	31%	5	
Other, mixed Race	2%	1	0%	0	
Primary language, % (<i>n</i>)					
English	62%	32	56%	9	
Spanish	37%	19	44%	7	
Other	2%	1	0%	0	
Born in the USA, % (<i>n</i>)	65%	34	56%	9	
Years in the USA	21.6	9.2	18.9	6.7	0.32
Highest year of education	13.3	3.0	12.0	4.1	0.38
Currently employed, % (<i>n</i>)	67%	35	50%	8	
Yearly income, Likert scale*	5.9	2.9	3.9	2.7	0.65
Child living w/ biol family, % (<i>n</i>)	75%	39	87.5%	14	
Family measures					
Reasoning, conflict tactics scale*	7.9	2.0	9.1	1.9	-0.58
Anxiety, adult attachment scale*	9.6	3.9	7.4	3.2	0.57

^a Effect size = (mean of attending all 5 – mean of attending < 5)/pooled SD

**p* < .05

Table 3 Significant associations between participant and facilitator WAI scores and parent measures

	<i>r</i>	<i>p</i> value
Facilitator-reported WAI scores		
White/European American vs. other (<i>ES</i>) ^a	0.87	.02
Highest year of education	-.38	0.02
Closeness, adult attachment scale	-.36	.03
BSI		
Global distress index	-.32	.047
Somatic score	-.32	.048
Phobia score	-.42	< .01
Psychoticism score	-.45	< .01
Parent-reported WAI scores		
Female vs. male gender (<i>ES</i>)	1.10	.03
Mexican vs. non-Mexican Latino ethnicity (<i>ES</i>) ^a	1.07	.02
Money earned last month	-.51	< .01
BSI hostility score	.33	.04
Laissez-faire family style	-.30	.06

^a Effect size = (mean of the 1st group, e.g. White/European American – mean of the 2nd group)/pooled SD

($t = 2.86$, $df = 42.5$, $p < .01$), and on the depression ($t = 2.76$, $df = 53.1$, $p < .01$), anxiety ($t = 2.11$, $df = 66$, $p = .04$), somatization ($t = 4.33$, $df = 65.9$, $p < .01$), obsessive-compulsive ($t = 2.94$, $df = 40.2$, $p < .01$), phobic anxiety ($t = 2.95$, $df = 58.8$, $p < .01$), and psychoticism ($t = 2.24$, $df = 41.1$, $p = .03$) subscales. A higher percentage of males (93%; $n = 14$ of 15) attended all five sessions than females (73%; $n = 38$ of 53), though this difference was not statistically significant (Fisher's exact test, $p = .10$).

Next we report relationships between WAI scores and adolescent measures, with significant findings summarized in Table 5. Higher WAI scores were observed for females versus males ($t = 2.39$, $df = 36$, $p = .02$ for facilitator scores and $t = 5.54$, $df = 38$, $p < .01$ for participant scores) and for URICA contemplation scores ($r = .40$, $p = .01$ for facilitator scores and $r = .52$, $p < .01$ for participant scores). Higher participant-reported WAI scores were also associated with higher URICA action ($r = .52$, $p < .01$) and readiness scores ($r = .55$, $p < .01$), as well as lower pre-contemplation scores ($r = -.34$, $p = .03$). Adolescents talking more about sex, alcohol, and drugs with their parents in the past 3 months according to the TAAPSS had higher facilitator-reported WAI scores

Table 4 Adolescent demographics and mental health measures that were significantly different by session attendance out of 5 possible sessions

	All 5 sessions (<i>N</i> = 52)		< 5 sessions (<i>N</i> = 16)		<i>ES</i> ^a
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Demographics					
Age	14.8	1.3	14.5	1.4	0.25
Female gender, % (<i>n</i>)	73%	38	94%	15	
Race/ethnicity, % (<i>n</i>)					
Hispanic	65%	34	50%	8	
Black/African American	15%	8	19%	3	
White/European American	10%	5	13%	2	
Other, mixed race	10%	5	19%	3	
Primary language, % (<i>n</i>)					
English	90%	47	75%	12	
Spanish	10%	5	19%	3	
Other	0%	0	6%	1	
Sexual orientation					
Bisexual	10%	5	19%	3	
Heterosexual	90%	47	81%	13	
Mental health (BSI)					
Global**	1.13	0.64	0.76	0.38	0.62
Depression**	1.20	0.87	0.76	0.42	0.55
Anxiety*	1.04	0.75	0.61	0.53	0.61
Somatization**	0.88	0.79	0.34	0.25	0.73
Obsessive-compulsive**	1.40	0.84	0.89	0.53	0.62
Phobic anxiety**	0.78	0.75	0.39	0.32	0.57
Psychoticism*	1.03	0.85	0.64	0.53	0.49

^a Effect size = (mean of attending all 5 – mean of attending less than 5)/pooled SD

**p* < .05; ** *p* < .01

Table 5 Significant associations between participant and facilitator WAI Scores and adolescent measures

	<i>r</i>	<i>p</i> value
Facilitator-reported WAI scores		
Female gender vs. male (<i>ES</i>) ^a	0.86	.02
URICA		
Contemplation Score	.40	.01
Readiness Score	.31	.06
TAAPSS Score	.37	.02
Adolescent-reported WAI scores		
Female vs. male gender (<i>ES</i>) ^a	5.54	< .01
Anal or vaginal sex (yes) vs. no (<i>ES</i>) ^a	−0.54	.09
URICA		
Contemplation score	.52	< .01
Action score	.52	< .01
Readiness score	.55	< .01
Pre-contemplation score	−.34	.03
Maintenance score	.30	.06

^a Effect size = (mean of the 1st group, e.g., female gender – mean of the 2nd group)/pooled SD

(*r* = .37, *p* = .02). No other significant differences were found for adolescent demographics, mental health, sexual behavior, and substance use in comparisons with session attendance and WAI scores. After Holm-Bonferroni adjustment, statistical significance remained for mean BSI somatization score differences by session attendance, as well as gender, URICA contemplation, and action score differences by participant-reported WAI scores.

Discussion

There are several important results from these analyses. Parents with more income and less perceived family conflict were more likely to complete the intervention. These findings are in keeping with several other studies (Kazdin et al. 1997; Snell-Johns et al. 2004), suggesting that families with less hardship and distress can be better retained in interventions. Relatively more interesting is the finding that the parents who completed the intervention also reported more anxiety

symptoms, suggesting that some parents with greater need for intervention were actually better retained.

With respect to adolescents, the retention results are quite surprising. Adolescents who completed the intervention, relative to those who did not, reported more depression, anxiety, somatization, obsessive-compulsive, phobic, and psychotic symptoms. This suggests that, as with the parents in this study, adolescents with greater distress and thus greater need were more apt to finish the intervention. This finding differs from previous research on family interventions that more often reports families who have more distress have lowered retention in interventions (Snell-Johns et al. 2004). But, research on youth serviced by the public sector (e.g., juvenile justice, child welfare, and alcohol and drug abuse) also reports a similar pattern of higher use of mental health services (Garland et al. 2005).

There are a number of reasons why retention of at-risk participants, such as homeless adolescents, is challenging for prevention programs, including psychological distress, systematic, and societal barriers (Orrell-Valente et al. 1999). However, for the adolescents in this study, a distressed emotional state seemed to be a potential mechanism for retention. This suggests a number of areas for further research on how greater stress may be associated with completing the intervention, such as through the related increased awareness of the need for support, higher motivation, and/or experience of more immediate benefits. Compared with other family interventions, STRIVE may be more acutely culturally responsive to the needs of distressed adolescents. This may be an artifact of both the curriculum and training of the facilitators. STRIVE facilitators are trained in how to implement the intervention in a culturally humble way while keeping health disparities, sociopolitical climate, and culture in mind. The curriculum is manualized to maintain fidelity, but it is also highly encouraged that the facilitator individualizes the examples to the family's culture. Establishing this positive cultural response may have assisted with retention. This is consistent with emerging research on being culturally responsive in engaging racial/ethnic minorities (Fryer et al. 2016).

The process of engagement as assessed by the therapeutic alliance was sensitive to several individual-level differences for parents. From the standpoint of the facilitators, a greater alliance was perceived with White/European American parents and parents with fewer mental health symptoms. This is consistent with prior work that suggests engaging with racial/ethnic minority families and families who are in more distress is more challenging (Garland et al. 2005; Kazdin et al. 1997). Interestingly, however, parents who identified as racial/ethnic minorities, women, those with lower income, and higher hostility symptoms reported an increased sense of alliance with the facilitators. Fully understanding, for example, why ethnic minority parents report greater alliance for themselves requires more research in areas such as access. Ethnic minority parents, whom often have limited access to interventions, may

have had positive perceptions of the alliance because of the accessibility of the intervention. Thus, in the current study, being more distressed (i.e., lower income, more hostility) or being a racial/ethnic minority person was not a barrier to alignment. Such findings are uncommon in family interventions, challenging the notion that the neediest families are more difficult to engage in building a relationship with the facilitators. This result speaks to the important role the facilitator(s) have of engaging families of "high need" and knowing that alliances can indeed be fostered between the facilitator and parents of at-risk youth. This study supports the notion that the parent buy-in to any intervention is essential in the retention and completion of the program. In a larger scale, this can assist with lowering the racial and ethnic disparities in mental health services (Garland et al. 2005). The findings around the therapeutic alliance and engagement with the adolescents were less conclusive. From the perspective of both the facilitators and the youth, female participants built more productive therapeutic alliances. Adolescents who reported greater comfort discussing sex with their parents were identified by facilitators as having a stronger therapeutic alliance. This last finding may suggest that youth who have an easier time discussing difficult topics may be more amenable to family interventions because they are open and "ready" to discuss difficult topics such as family conflict. The remainder of the findings was not significant at the conventional $p < .05$ level, and we hesitate to interpret them further.

There are a few limitations to this study. First, these data come from an efficacy trial of a family intervention, not an efficacy trial of intervention implementation. As such, we have limited information on key engagement processes aside from the therapeutic alliance. Second, numerous statistical tests were conducted on data from a relatively small randomized control trial, making it difficult to adjust for type I error without preventing us from reporting on relationships which exist in the population (type II error). Third, on a related point, we focus on bivariate associations and not multivariate models because these analyses are both exploratory and have limited statistical power for such models. In addition, small Cronbach's alphas less than 0.70 were found for a number of scales, indicating less than adequate reliability between scale items, especially low alpha values are noted for the Conflict Tactics Reasoning scale, the discomfort-in-closeness subscale, and a number of adolescent-assessed components of family functioning. Last, the use of self-report measures was a limitation of this study. Self-report measures rely on the participant's report of their symptoms, behaviors, and experiences. Honesty, introspective ability, and interpretation ability can influence participants' responses. The implication is that self-report measures may not be assessing the underlying constructs they were intended to capture in this sample, and the results should be interpreted with caution. Despite these limitations, we believe these data are

informative for several reasons: relatively few studies have looked at retention and engagement in the context of prevention programs (Ingoldsby 2010) and still fewer in HIV prevention programs (Kapungu et al. 2012); no studies have looked at retention and engagement in prevention programs with homeless youth (to our knowledge); we found some very informative counter-intuitive findings with respect to family distress which suggest that for these families who are almost all distressed, some modest increased levels of additional distress may be a motivation for retention and engagement in treatment.

The implications of these findings are significant in understanding the complexities of engagement for at-risk youth and their families. It is also important to note that both participant and provider perceptions are important in development of a strong therapeutic alliance. Given providers' perception that their alliances were stronger with White/European American families and those with fewer mental health symptoms, these findings warrant further exploration of the development of cultural humility, awareness training, and improving mental health literacy for facilitators. Because working with families who may have more distress, economically and health wise, is perceived to be more challenging, preparing facilitators to work with these families is paramount.

The fact that families who were experiencing more distress had better therapeutic alliance than their counterparts suggests that there may be additional need for the development of psychoeducational interventions for families in crisis. More work needs to be done, but we can say that brief psychoeducational family interventions can be engaging and efficacious for at-risk adolescents and their families, but for these to be effective, we may need to determine who among this population is the best target for these types of family interventions. This study contributes to understanding how to engage and retain underserved populations in family interventions within the implementation phase of the TSci Impact Framework (Spoth et al. 2013). These findings can help in the development of better strategies for improving participation in family-based interventions that can improve the health outcomes of young people over their lifetimes.

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Compliance with Ethical Standards

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

Ethical Approval All data collection procedures were carried out with approval from, and in compliance with, the Institutional Review Board of the University of California, Los Angeles.

Informed Consent Informed consent was obtained from all individual participants in the study.

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