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Multiple Family Groups to reduce child disruptive behavior difficulties: Moderating effects of child welfare status on child outcomes

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Abstract

Children who remain at home with their permanent caregivers following a child welfare (CW) involvement (e.g., investigation, out-of-home placement) manifest high rates of behavioral difficulties, which is a risk factor for further maltreatment and out-of-home placement if not treated effectively. A recently tested Multiple Family Group (MFG) service delivery model to treat youth Disruptive Behavior Disorders (DBDs) has demonstrated effectiveness in improving child behavior difficulties among hard-to-engage, socioeconomically disadvantaged families by addressing parenting skills, parent-child relationships, family communication and organization, social support, and stress. This exploratory study examines whether child behavioral outcomes for MFG differ for families with self-reported lifetime involvement in CW services compared to other families, as families with CW involvement struggle with additional stressors that can diminish treatment success. Youth (aged 7–11) and their families were assigned to MFG or services as usual (SAU) using a block comparison design. Caregivers reported on child behavior, social skills, and functional impairment. Mixed effects regression modeled multilevel outcomes across 4 assessment points (i.e., baseline, mid-test, post-test, 6 month follow-up). Among CW-involved families, MFG participants reported significantly reduced child oppositional defiant disorder symptoms at 6-month follow-up compared with SAU participants. No other differences were found in the effect of MFG treatment between CW and non-CW involved families. Findings suggest that MFG may be as effective in reducing child behavior difficulties for both CW and

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non-CW involved families. As a short-term, engaging, and efficient intervention, MFG may be a particularly salient service offering for families involved in the CW system.

Keywords

child welfare; mental health services; evidence based treatment; Multiple Family Groups; moderation analyses

Background

Children remaining with their permanent caregivers following child welfare (CW) involvement (e.g., prior CW investigation due to child maltreatment, prior out-of-home placement, referred for services due by CW authorities) manifest higher levels of hyperactive, oppositional, disruptive, and aggressive behavior when compared to the general population (Achenbach, 1991; ACF 2005; Bellamy, 2008). Their families (hereafter known as “CW-involved families”) also experience multiple, co-occurring stressors, which further exacerbate child behavioral difficulties (e.g., poverty, domestic violence, parent substance abuse, parent psychiatric illness, unstable housing; ACF, 2005; Barth, 2009; Kemp, Marcenko, Hoagwood, & Vesneski, 2009). Without effective interventions to address these difficulties (e.g., behavioral parent training programs), child behavioral difficulties increase the risk for future maltreatment and out-of-home placement (Barth, Wildfire, & Green, 2006).

However, there are concerns that treatment outcomes for CW-involved families may be diminished relative to other families. According to the ABCX model on family stress (McCubbin & Patterson, 1983; Weber, 2011), the combined influence of stressors, inadequate resources, and ineffective coping strategies often lead to a crisis (e.g., child maltreatment, child behavioral difficulties, CW involvement). Following the crisis, existing stressors continue to pile-up while new ones emerge (e.g., conflicts between multiple mandated services). At the same time, families continue to access existing resources as well as new ones (e.g., child mental health treatment). Positive adaptation is likely to occur if the existing or new resources (e.g., child mental health treatment) are able to improve families’ coping strategies (e.g., family communication, parent-child relationships, family organization, discipline), their perception of the stressors (e.g., focusing on the positive or negative impact of stressful events), as well as impact directly on existing and new stressors (e.g., social isolation, barriers to treatment). Conversely, negative outcomes (e.g., continued child behavioral difficulties) result if the new resources are unable to impact family’s coping strategies, perceptions of stressors, or the new and existing stressors.

For example, stressors common to families involved in the CW system (e.g., caregiver mental health difficulties, substance use, domestic violence, stress, prior negative experiences with other service providers) have been linked to diminished child mental health treatment compliance and success (Hurlburt, Nguyen, Reid, Webster-Stratton, & Zhang, 2013; Kerkorian, McKay, & Bannon, 2006; Leslie, Aarons, Haine, & Hough, 2007; Reyno & McGrath, 2006; Rishel, Greeno, Marcus, & Anderson, 2006). Individuals mandated to services often may not perceive a need for treatment themselves, resulting in poor

commitment and participation in the treatment process. When these attitudinal aspects of engagement are compromised, treatments are less successful (Staudt, 2007). Conflictual relationships with CW and other service systems (Kemp et al., 2009) may also result in wary families withholding critical information about family circumstances for fear of getting involved again with CW services (Gopalan, Fuss, and Wisdom, 2014), further hindering treatment effectiveness. As a result, CW-involved families are less likely to reap the benefits of treatment compared to other families.

To date, few studies have examined whether CW involvement moderates treatment effectiveness among evidence-based behavioral parent training programs designed for outpatient clinic settings most likely accessed by CW-involved families. In a pre-post design evaluation of Parent-Child Interaction Therapy (PCIT) among participants attending a university-based clinic, Timmer, Urquiza, Zebell, & McGrath, 2005 found a small but significant treatment by maltreatment status interaction effect, indicating that maltreated children (2–8 years old) manifested smaller reductions (i.e., fewer problems reported pre-treatment, same levels of problems post-treatment) in externalizing behavior problems compared to children with no maltreatment history. However, there were moderate to large treatment effects regarding the improvement of behavioral difficulties over time for all participants regardless of maltreatment status. Conversely, an exploratory study of the site-randomized controlled trial of the Incredible Years (IY) parent training program within Head Start programs reported no evidence of significant treatment by maltreatment status interactions effects on multiple measures of behavior problems, suggesting that IY held similar benefits regarding behavioral outcomes (average age 4.7 years old) for families with and without maltreatment (Hurlburt et al., 2013). At the same time, analyses run separately by maltreatment status indicated no significant treatment effects (IY vs. control condition) on any child behavior outcomes among families reporting prior maltreatment history. Further analyses of changes over time in child behavior outcomes among the maltreated families in the intervention group (based on reported means and standard errors) indicated only small to medium effects of treatment from baseline to post-test, as well as baseline to follow-up (12–18 months following baseline assessment). As a result, findings are mixed regarding whether CW status moderates treatment effectiveness for child behavior.

Furthermore, few studies have focused exclusively on CW-involved population where children remained with their permanent caregivers. Our review of the literature found one study where PCIT was tested exclusively with physically abusive parents and their children (ages 4–12; Chaffin et al., 2004). While significant reductions in child behavioral difficulties were reported from pre-test to post-test for all treatment groups, there were no significant differences by treatment groups over time (PCIT vs. community group).

In summary, findings are mixed whether CW involvement status moderates treatment effectiveness as well as whether the behavioral parent training programs previously cited are effective in reducing child behavioral difficulties for CW-involved families. Although both PCIT and IY have been applied to older children, both were originally developed for those in preschool. Older youth who are generally more difficult to treat (Dishion & Patterson, 1992), and as a result, there is some question as to whether PCIT and IY are developmentally appropriate for school-aged children (7–11) are often most likely first

referred for mental health treatment via school referrals (Ghandour, Kogan, Blumberg, Jones, & Perrin, 2012), and represent approximately 36% of those youth entering the CW system (ACF, 2005). Consequently, alternative behavioral parent training programs designed for school-aged children and effective in reducing child behavioral difficulties among CW-involved families are needed.

Moreover, one must consider the context in which CW-involved families access treatment. Under-resourced, publically funded outpatient clinics offering behavioral parent training have pervasive difficulties engaging and retaining low-income families, including those involved with CW services, into treatment (McKay & Bannon, 2004; Lau & Weisz, 2003). Notably, Timmer et al. (2005) reported that maltreated children with clinically significant levels of behavior problems were more likely to drop out of PCIT compared to non-maltreated children. Such settings also struggle with chronic shortages in available providers (Asen, 2002). This requires cost-effective and engaging means for multiple families to be seen simultaneously. However, interventions requiring extensive investments in finances, time and provider resources, specialized space and equipment requirements, and a focus on one family at a time (i.e., PCIT; Chaffin et al., 2004) pose significant implementation challenges. Finally, as suggested by the ABCX model, CW-involved families are likely to benefit from treatment models that are sensitive to their unique stressors and service experiences, which are known to diminish treatment success.

The Multiple Family Groups (MFG) service delivery model to reduce child disruptive behavior disorders among school aged children (aged 7–11) presents a potential alternative parent training that is sensitive to the needs of CW-involved families, as well as engaging, effective, and easy to implement. MFG was designed to address shortages of available service providers in inner-city settings by having multiple families seen at time. A manualized curriculum with parsimonious and low-cost training and supervision strategies (Chacko et al., 2014; Gopalan et al., 2014; McKay et al., 2011) further increases ease of implementation. Finally, multiple strategies to address concrete (e.g., lack of transportation, child care, conflicting time demands) and perceptual (e.g., mental health stigma, prior negative service experiences) barriers to treatment (McKay & Bannon, 2004) promote treatment engagement for low-income families (McKay et al., 2011). Discussed in prior publications, MFG integrates over two decades of research on effective treatment targets and strategies from behavioral parent training and family therapy to reduce child behavioral difficulties (e.g., parenting skills, family organization, parent-child relationships, family communication) and premature termination (e.g., social isolation, stress; Kazdin et al., 1995). This literature has been subsequently distilled into the MFG core concepts known as the “4 Rs” (Rules; Responsibility; Relationships; Respectful communication) and “2Ss” (Stress and Social Support), provided over the course of 16 weekly sessions with 6–8 families per group. To date, MFG has been disseminated in outpatient clinics across New York state (called the “4Rs and 2Ss Family Strengthening program), with technical assistance available through the Community Technical Assistance Center (CTAC; <http://www.ctacny.com/>).

MFG content and processes provide specific benefit for CW-involved families. An emphasis on coping with stressors relevant to inner-city contexts (e.g., poverty, social disorganization,

community violence and crime) promotes treatment retention for low-income families overall, and also addresses key neighborhood risk factors associated with increased prevalence of child maltreatment (Maguire-Jack, 2014). Families are provided with child care, transportation, and a meal at each session and, as well as extensive phone outreach between sessions to address concrete treatment barriers. Such practical assistance further promotes engagement with workers and other services for CW-involved families (Dawson & Berry, 2002).

Although not a treatment for trauma per se, MFG content and processes align with many trauma-informed service recommendations (Freeman, 2001; Harris & Fallot, 2001) which are especially salient for CW-involved families who often possess extensive traumatic experiences as well as contentious, disempowering service experiences (Kemp et al, 2009). Each MFG session involves psychoeducation, didactic discussion, hands-on activities, in-vivo skill development and rehearsal, as well as weekly homework exercises which help families increase their capacity to develop new resources (Freeman, 2001; Harris & Fallot, 2001). By virtue of having multiple families present, group members can efficiently enhance their support networks and reduce social isolation (Harris & Fallot, 2001). The presence of other families in the group with similar concerns and co-facilitation by a family peer advocate (caregiver with personal experience caring for a child with mental health difficulties) normalizes family problems and reduces stigma towards mental health treatment. Group members are encouraged to share information and provide feedback with each other, a valuable feature since feedback from a peer is perceived as less threatening than from a clinician (McKay, Gonzales, Stone, Ryland, & Kohner, 1995). Such a philosophy echoes the recommendations for emphasizing existing family strengths, validating families' expertise, as well as promoting trust and collaboration between consumers and providers within trauma-informed services (Harris & Fallot, 2001). As a result, families are more likely to feel empowered to invest and participate in the treatment process. For CW-involved families with a history of contentious, disempowering, and largely involuntary service experiences (Kemp et al., 2009), treatment attendance alone may be insufficient to produce successful treatment outcomes. Rather, families should perceive treatment as relevant, and actively participate in the change process (Staudt, 2007).

A recently completed effectiveness trial evaluating MFG prioritized external validity by utilizing clinic-referred youth with complex psychosocial difficulties, embedding MFG within routine outpatient mental health clinics in low-income, predominantly minority, inner-city communities, and engaging existing clinic staff to deliver MFG. At post-test, experimental MFG participants manifested significantly reduced child behavioral difficulties and increased social skills compared to services as usual (SAU) control group participants (Chacko et al., 2014). At 6 months follow-up, experimental participants manifested significantly reduced child behavior difficulties, impact of child behavioral difficulties on children's relationship with playmates, and overall severity of child behavioral difficulties and need for treatment (Gopalan et al., 2014).

Prior studies with the CW-involved subgroup participating in the MFG effectiveness study indicated that CW involved caregivers tended to perceive greater barriers to accessing MFG (e.g., crises at home) and less treatment satisfaction compared with families not involved

with CW services (Gopalan et al., 2011). Such findings would predict poorer attendance and outcomes among CW involved families compared to others. Interestingly, though, the same study found no differences in MFG attendance rates by CW involvement status. Qualitative feedback from CW-involved caregivers indicated that retention in MFG was facilitated by facilitators who were genuinely caring and non-judgmental, child care and transportation expenses, as well as MFG content and activities that were perceived as “fun”, easily understood, effective, and informative (Gopalan, Fuss, & Wisdom, 2014). Such findings suggest that CW-involved participants were actively invested in the treatment process, a necessary component to produce effective treatment outcomes (Staudt, 2007). The next step in this line of research is to further explore other potential moderating effects of CW involvement, such as if the MFG treatment effect is reduced for families involved in CW services.

Consequently, this paper focuses on the following research question: Is the MFG treatment effect for CW-involved families attenuated when compared to other families? Given how MFG aligns with the needs of CW involved families, we hypothesized that there would be no reduction in the MFG treatment effect by CW involvement status at each assessment point. Analyses examined the between-group (MFG vs. SAU) differences on child outcomes at post-test and 6 months follow-up using CW status as a moderating variable. This study is considered exploratory, as these sets of analyses were not planned as part of the original study design and utilized a broad, heterogenous definition of CW involvement (See Methods). As a result, we first document the demographic characteristics and vulnerabilities (e.g., caregiver mental health, stress), which would predict attenuation of the MFG treatment effect. Next, we examine the MFG treatment effect with CW status as moderating variable using mixed effects regression.

Methods

Procedures

From 2006–2010, children (aged 7–11) and their families were recruited from 13 community-based outpatient mental health clinics serving children and families in low-income urban communities across the New York City metropolitan area. Research staff identified participating agency sites from among the largest publicly funded clinics in the New York City metropolitan area, and who had all participated in prior child services studies. All approached agencies agreed to participate in the study. Common characteristics of the 13 outpatient clinics included: (1) provision of a range of child mental health services, including medication monitoring as well as individual, family, and group therapy; and (2) a client base that was predominantly low-income, minority (e.g., African American, Latino) youth and their families. This study has been approved by the Institutional Review Board.

Potential participants were first identified by clinic staff from among those families seeking treatment at community-based clinics. Adult caregivers were informed about the study, and were subsequently referred to research staff if they were interested in participating (n = 416). Written consent forms were signed by legal guardians, while research staff obtained verbal assent from youth participants. As only legal guardians could sign consent forms, families were excluded if youth were in foster care placement. Youth were also excluded if a

significant cognitive impairment interfered with understanding program content or the informed consent process, as determined by research staff. Research staff screened consented families by obtaining caregiver reports on youth behavior using the Disruptive Behavior Disorders Checklist (Pelham, Evans, Gnagy, & Greenslade, 1992). Youth ages 7–11 were eligible to participate in the study if they met Diagnostic and Statistical Manual of Mental Health Disorders- fourth edition (DSM-IV) symptom criteria for Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD) (American Psychiatric Association, 2000). As reported in a prior manuscript (Gopalan et al., 2014), $n = 96$ potential participants were excluded from the study due to not meeting inclusion criteria ($n = 91$), declining to participate and not completing screening measures ($n = 2$), as well as those who were not appropriate for treatment or misreported as initially eligible ($n = 3$).

Following screening, eligible youth and their families ($n = 320$; including their legal guardian, additional primary caregivers, and siblings) were assigned to the MFG experimental plus services as usual (MFG; $n = 225$) or services as usual only (SAU; $n = 95$) treatment condition using a block comparison design. At each site, up to 8 families were assigned to the MFG condition while a second set of participants were subsequently assigned to the SAU study condition (e.g., see Goodwin et al., 2001 for a similar allocation procedure). This study utilized a 2:1 allocation ratio (6–8 families to MFG, 3–4 families to SAU) to ensure MFG groups were quickly and efficiently populated. This ratio maximized study efficiency with little impact on statistical validity, which is only reduced when the ratio is 3:1 or more (Dumville, Hahn, Miles, & Torgerson, 2006). Field research staff consenting participants had no control over condition allocation, and were blind to youth and family profiles when allocating to treatment conditions. Moreover, the use of written, standardized assessment materials completed independently by caregivers minimized the impact of subsequent evaluation bias due to treatment condition.

Participant youth and their legal guardians completed assessment measures at baseline, mid-test at 8 weeks, post-test at 16 weeks, and at 6-months follow up. Response rates varied by assessment point, with 244 out of 320 participants responding at mid-test (75%), 260 out of 320 responding at post-test (81%), and 221 out of 320 responding at 6 months follow-up (69%). A significantly greater number of SAU participants (79%, $n = 75$) responded at 6 months follow-up compared to MFG participants (65%, $n = 146$; Chi-square = 6.18, $p = 0.01$). At 6 months follow-up, responders differed from non-responders by caregiver ethnicity (Chi-square = 14.30, $df = 5$, $p = 0.01$), such that 77% of African American, 68% of Hispanic, and 100% Native American caregivers responded compared to only 50% of Caucasian caregivers. However, there were no significant baseline demographic differences by treatment condition among those participants who did respond at 6 months follow-up ($n = 221$). No significant differences in response rates were found for other assessment points by treatment condition. Additional details about study procedures are available in prior work (Chacko et al., 2014; Gopalan et al., 2014; McKay et al., 2011).

Multiple Family Group (MFG)—In addition to receiving additional services identified for them through the outpatient clinic (e.g., outpatient individual and family therapy, group-based treatment, medication management), MFG participant youth and their families took part in weekly, 2 hour group sessions over the course of 4 months. Sessions were co-

facilitated by a site clinician and a family peer support advocate. As described in previously published manuscript (Chacko et al., 2014), research staff trained MFG facilitators using a mixture of didactic and experiential exercises (lecture, group discussion, role plays) which covered group facilitation and engagement skills, as well as MFG core competencies. Training lasted approximately 5–6 hours over 1–2 days at participating sites. Session content focused on parental discipline and contingent rewards, family organization, family communication, parent-child relationships, identifying and coping with stress, as well as increasing social support networks. As reported in prior studies (Chacko et al., 2014), participants in the MFG experimental group attended, on average, 59% of MFG sessions (SD = 7.55%, Range 46% - 77%). Research staff measured fidelity (adherence to process and content) by directly observing a random selection of sessions from 43% (15 out of 35) of all MFG groups across the 13 sites. Based on these measures, research staff rated MFG facilitators as adhering to 94% of session content and procedures.

Services -As-Usual (SAU)—The SAU condition included all available services offered by participating outpatient mental health clinics, including outpatient individual therapy, medication management, group-based treatment, family-based treatment, case management, crisis management, or inpatient hospitalization. See Chacko et al., (2014) and Gopalan et al., (2014) for breakdown of services received by treatment condition.

Participants

At baseline, 40% of caregivers (n = 129) in the total sample reported having current or prior child welfare (CW) involvement (i.e., ever having an open CW case, child placed in foster care, referred and/or mandated by a CW organization to bring their child to counseling, referred by CW agency to seek other services, seeking services in order to receive full custody of their children or to avoid having their children removed). Among participants in the MFG condition, n = 84 (37%) indicated lifetime child welfare involvement, while n = 141 (67%) indicated no lifetime child welfare involvement. Among participants in the SAU condition, n = 45 (47%) indicated lifetime child welfare involvement, while n = 50 (53%) did not. There were no statistically significant differences found between CW and non-CW involved participants regarding allocation to treatment condition, or response rates. Within the CW involved group, there were 40% (n = 52) of cases reporting an open child welfare case at the time of baseline assessment. No significant differences were found regarding percentage of open child welfare cases by treatment condition.

Table 1 presents demographic and risk status information for the total sample and by CW involvement status. Risk status was operationalized by caregiver scores in the clinically significant range on the Parenting Stress Index- Short form (PSI-SF; Abidin, 1995; Clinically significant score > 90) and the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; Clinically significant score > 16). As seen in Table 2, the majority of youth were male, residing in single-parent, low-income, ethnic and racial minority families. Table 1 indicates that lifetime CW-involved families significantly differed from non-CW involved families on child ethnicity, caregiver employment status, and CES-D clinical status. According to Table 2, CW involved children were more likely to be Black/ African American than non-CW involved youth. CW involved children were also less likely

to be Hispanic/Latino compared to non CW-involved children. Such findings are consistent with the racial composition of national CW populations (ACF, 2005). CW-involved caregivers were less likely to be employed fulltime than non-CW involved caregivers. Finally, CW-involved caregivers were more likely to report clinically significant depressive symptom levels at baseline compared to non CW-involved caregivers, a finding echoed by nationally representative studies of families involved in CW services (U.S. DHHS, n.d.). As a result, we confirmed that families with lifetime CW involvement differed from others on vulnerabilities (e.g., depression symptoms) that also predict treatment attenuation.

Outcome Measures

IOWA Connors Rating Scale (IOWA CRS; (Waschbusch & Willoughby, 2008)—

The IOWA CRS is a caregiver-report measure of child behavioral difficulties, which has strong psychometric properties, and has been utilized in multiple studies to monitor treatment response. In this study, caregivers rated the severity of their children's inattentive-impulsive-overactive (IO) and oppositional defiant (ODD) behavior (0 = *not at all*, 1 = *just a little*, 2 = *pretty much*, and 3 = *very much*), with greater symptom severity indicated by higher scores. For this study, five items measuring ODD behaviors were summed to compute the ODD subscale (Range: 0 to 15). Cronbach α s were reported for the current sample at baseline ($\alpha = 0.79$), mid-test ($\alpha = 0.83$), post-test ($\alpha = 0.85$), and 6 month follow-up ($\alpha = 0.86$).

Social Skills Rating System - Social skills subscale (SSRS-SSS; Gresham & Elliott, 1990)—

SSRS Social Skills Subscale (SSRS-SSS), measured the frequency of social skills exhibited by youth (i.e., cooperation, assertion, responsibility, empathy, and self-control) as rated by caregivers along a 3-point Likert scale (0 = *never*; 1 = *sometimes*; 2 = *often*). More frequent use of prosocial skills is indicated by higher scores. For this study's sample, Cronbach's α s were reported at baseline ($\alpha = 0.88$), post-test ($\alpha = 0.90$), and 6 month follow-up ($\alpha = 0.92$).

Impairment Rating Scale (IRS; Fabiano et al., 2006)—

Caregivers rated the impact of children's difficulties on six functional domains, with one item measuring each (IRS#1: relationship with peers, IRS#2: relationship with the parent[s], IRS#3: academic progress, IRS#4: self-esteem, IRS#5: family functioning, IRS#6: overall impairment/Need for services). Each functional domain item was rated using a 7-point visual analogue scale ranging from 0 = "Not a problem at all. Definitely does not need treatment or special services" to 6 = "Extreme problem. Definitely needs treatment and special services". The IRS has demonstrated sensitivity in detecting effects of family-based psychosocial treatments for child behavior difficulties, with acceptable levels of reliability and validity (Chacko et al., 2009). Each IRS item measured at baseline, post-test, and 6 months follow-up constituted separate outcomes for current analyses.

Data Analysis

Descriptive and univariate statistics were examined for each outcome by treatment condition and lifetime CW involvement status at each assessment point (See Table 2). Analyses were conducted using Stata 13.1 (StataCorp, 2013). To examine whether the MFG treatment

effect differed between lifetime CW vs. non-CW involved families, mixed effects regression modeling (also known as multilevel or hierarchical linear modeling) for each outcome over time was conducted using SuperMix software (Hedeker, Gibbons, du Toit, & Cheng, 2008), with an intention-to-treat (ITT) analysis strategy. Mixed effects regression modeling is recommended for analysis of longitudinal data over other analyses, which use listwise deletion when confronted with missing data (Gueorguieva & Krystal, 2004). Rather than deleting entire cases, mixed effects regression modeling allows for different timing and number of measurements within cases. As a result, cases were included in analyses if there was at least one data point present across all assessments. Mixed effects regression is an appropriate method to model longitudinal change involving data where there is attrition over time with the assumption that the missing data is ignorable (i.e., at least missing at random [MAR]). Preliminary exploratory and sensitivity analyses with the data (e.g., comparing participants with and without missing data across all assessment points on baseline demographic variables) confirmed that the MAR assumption was reasonable. Correlation between measurements within cases are accounted for with this method.

Mixed effects regression models included a dichotomous variable for treatment condition (MFG versus SAU), with time modeled as dummy variables for each assessment point (baseline as the reference category). All analyses included the condition (MFG vs. SAU) by assessment point dummy variable interactions (e.g., Condition X Mid-test) as well as lifetime CW involvement (CW involved vs. non-CW involved) by assessment point dummy variable interactions (CW X Mid-test). Three-way interactions for treatment condition by lifetime CW involvement by assessment point (CW X Condition X Mid-test) were also included. Intercepts varied randomly within each model. Assessment points were nested within individuals, where child participant identification variables were the second level function. The third level of analysis included family-level identification variables as $n = 22$ families had more than one child enrolled in the study. Preliminary reliability analyses examined the level of clustering by site for each outcome variable using reliability analysis. As all intraclass correlation coefficients (ICC) were non-significant at all time points, with Cronbach alpha's all close to zero, we concluded that there was no evidence of clustering by site. As result, we determined that it was not necessary to account for this level of nesting in analyses.

Preliminary analyses examined differences in the baseline levels of the outcome, demographic, and risk factor variables by treatment condition separately for lifetime CW-involved and non-CW involved cases, as significant differences between MFG and SAU treatment condition within each lifetime CW involvement subgroup could bias final mixed effects regression results. Based on these analyses, we found significant differences between MFG and SAU treatment conditions (within each CW involvement subgroup) for baseline levels of IRS#2 (Impairment with parents) and IRS#5 (impairment with family) outcome variables, as well as caregiver age. Among the CW-involved cases, significant baseline differences were found by treatment condition for the IRS#5 (impairment with family) outcome variable, where MFG participants manifested higher average baseline scores ($M = 4.21$, $SD = 1.32$) than SAU participants ($M = 3.60$, $SD = 1.40$; $t = 1.48$, $df = 124$, $p = 0.02$). Among the non-CW involved cases, significant differences were found by treatment condition for the IRS#2 (Impairment with parents) outcome variable, IRS#5 outcome

variable, and caregiver age. Specifically, MFG caregivers were younger ($M = 36.02$, $SD = 8.75$) on average than SAU participants ($M = 39.22$, $SD = 9.22$; $t = -2.16$, $df = 180$, $p = 0.03$). MFG participants manifested higher average baseline IRS#2 ($M = 3.92$, $SD = 1.47$) scores than SAU participants ($M = 3.42$, $SD = 1.41$; $t = 2.06$, $df = 183$, $p = 0.04$). Similarly, MFG participants manifested higher average baseline IRS#5 scores ($M = 4.12$, $SD = 1.45$) than SAU participants ($M = 3.54$, $SD = 1.40$; $t = 2.38$, $df = 184$, $p = 0.02$). Given these baseline differences between MFG and SAU treatment conditions within CW involvement subgroups, the next stage of analysis determined if including IRS#2, IRS#5, and caregiver age as covariates were likely to impact final results. To examine if baseline levels of the outcome variable were needed as a control covariate for the models involving IRS#2 and IRS#5 outcomes, respective baseline levels of each variable as well as interactions of the baseline level and all other model covariates were included within preliminary moderator analyses (Kraemer et al., 2002). No systematic bias was noted in these analyses, as no coefficient including the interaction of the baseline level of the outcome variable (IRS#2 or IRS#5) by lifetime CW involvement status or treatment condition were statistically significant. Similar preliminary moderator analyses were also conducted by including baseline caregiver age and all its interactions among model covariates. For caregiver age, however, there were significant interaction coefficients by caregiver age, lifetime CW involvement status, and treatment condition among some of the outcome variables.

Consequently, the next step in our analyses included caregiver age as an additional covariate for all mixed effects regression models. The full mixed effects regression models for all outcomes included baseline caregiver age as a covariate as well as its interactions among all other model covariates, including 2-way (e.g., Caregiver Age X Mid-test), 3-way (e.g., Caregiver Age X Condition X Mid-test), and 4 way interactions (e.g., Caregiver Age X CW X Condition X Mid-test). Kraemer et al. (2002) recommend that moderation effects are best determined through comparison of treatment effect sizes, where the combined value of all parameters in the multivariate equation are required, rather than attempting to interpret individual interaction parameters (e.g., CW X Condition X Mid-test). For this reason, we present both the multivariate results (Table 3) as well as the linear contrasts (Table 4). Linear Contrasts use Z statistics to test for significant differences between the MFG and SAU conditions (e.g. treatment effect) on each outcome variable at mid-test (Iowa CRS ODD), post-test, and 6 months follow-up (all outcome variables) assessment points, performed separately for the lifetime CW involved and the non-CW involved groups. Linear contrasts were also used to examine if there were any significant differences in the MFG treatment effect for lifetime CW vs. non-CW involved families.

Due to concerns about interpretation with a model of this complexity, we also ran a simpler model with the caregiver age covariate alone and none of the subsequent interactions by caregiver age. For all outcome variables, the simpler model resulted in lower Akaike Information Criterion (AIC) values compared to those of more complex models, indicating that the simpler models resulted in greater model fit. As findings from the simpler models were similar to results from the more complex models, we presented the multivariate regression parameters (Table 3) and linear contrasts (Table 4) from the simpler models in this paper. Finally, post-hoc analyses explored using the open CW case ($n = 52$) indicator as

a moderator for analyses to confirm if results among families with active CW cases at baseline were similar to those using the lifetime CW involvement status as a moderator.

Results

Univariate descriptive statistics examined differences by treatment condition regardless of CW status (not shown). Compared to SAU participants, MFG participants reported lower ODD scores at post-test ($t = -2.49$, $df = 250$, $p = 0.01$), and 6 month follow-up ($t = -2.56$, $df = 212$, $p = 0.01$), lower IRS#1 scores at 6 month follow-up ($t = -2.30$, $df = 218$, $p = 0.02$), greater IRS #2 scores at baseline ($t = 2.49$, $df = 308$, $p = 0.01$), lower IRS#4 scores at 6 month follow-up ($t = -2.31$, $df = 219$, $p = .02$), greater IRS #5 scores at baseline ($t = 3.33$, $df = 310$, $p = 0.001$), lower IRS#6 scores at 6 month follow-up ($t = -2.39$, $df = 218$, $p = 0.02$), and greater SSQ scores at post-test ($t = 2.49$, $df = 239$, $p = 0.01$). Univariate statistics further examined differences by CW involvement status regardless of treatment condition (not shown). CW-involved participants reported greater ODD scores than non-CW involved participants at baseline ($t = -2.07$, $df = 286$, $p = 0.04$) and post-test ($t = -2.51$, $df = 250$, $p = 0.01$).

Table 2 presents means and standard deviations of all outcome variables for this study by treatment condition, assessment point, and lifetime CW involvement status. As stated previously, significant baseline differences between treatment conditions were found for IRS#2 and IRS#5 within each CW involvement subgroup. Compared to CW SAU participants, CW MFG participants reported lower ODD ($t = -3.45$, $df = 86$, $p < 0.01$) and IRS#1 scores ($t = -2.71$, $df = 87$, $p = 0.01$) at 6-month follow-up.

Table 3 presents the multivariate regression models for each outcome variable. For ODD symptoms, significant interaction parameters between condition and assessment point (i.e. Condition X Post, Condition X 6 mo F/U) suggested significant differences by treatment condition at post-test and 6 month follow-up. The significant CW parameter further suggested that CW involved children manifested significantly higher average ODD symptom levels at baseline compared to non-CW involved youth. Significant Condition X assessment point interaction parameters were also present for social skills (SSRS-SSS), impairment with parents (IRS #2), Impairment with self-esteem (IRS #4), and Impairment with family (IRS#5). None of the interaction parameters involving CW status were statistically significant for any outcome, suggesting that lifetime CW status did not moderate the treatment effect.

Table 4 illustrates linear transformations to statistically test and confirm differences in outcomes between MFG and SAU treatment groups at mid-test, post-test, and 6 months follow-up for each CW involvement group. As seen in Table 4, the MFG intervention for lifetime CW involved participants resulted in significantly less ODD symptoms at 6 months follow-up compared with SAU participants, reinforcing the significant findings from Table 3. However, Table 4 indicates that no other differences by treatment condition were confirmed based on significant condition by assessment point interaction parameters in Table 3 (ie, SSRS-SSS, IRS #2, IRS #4, IRS #5). Table 4 further indicates that CW involved MFG participants reported less impairment with playmates (IRS#1) compared to SAU

participants. However, as results for this outcome were non-significant in the more complex multivariate model which included all the caregiver age interactions, we cannot conclusively say there was a significant treatment effect for the CW involved group on impairment with playmates.

Finally, all analyses for the simpler caregiver age model were repeated using the open CW case indicator in place of the lifetime CW involvement indicator as a moderating variable. Among open CW cases, MFG was associated with reduced ODD symptoms compared to SAU at post-test ($b = -3.28$, $SE = 1.22$, $Z = -2.69$, $p = 0.01$, Cohen's $d = 0.95$), and 6 month follow-up ($b = -4.31$, $SE = 1.25$, $Z = -3.45$, $p < 0.01$, Cohen's $d = 1.24$).

Discussion

This exploratory study examined whether lifetime CW involvement status moderated the treatment effect of a Multiple Family Group (MFG) service delivery model designed to reduce youth behavioral difficulties in community based outpatient mental health settings. We hypothesized that there would be no reduction in the MFG treatment effect by CW involvement status at each assessment point. Findings from this study support our hypotheses, such that multivariate models indicated no significant CW interaction parameters, while linear contrasts further confirm no significant reduction in the MFG treatment effect by CW involvement status. Importantly, MFG treatment effect sizes among lifetime CW participants for the ODD and IRS#1 outcomes were substantially larger than the small to moderate effect sizes reported with the full MFG study sample (Gopalan et al., 2014). The lack of significant MFG vs. SAU differences for the non-CW involved group suggests that the treatment effects reported with the full sample may have been driven by the CW-involved group.

Such findings add the growing body of literature examining the differential impact of behavioral parent management studies on specifically on CW-involved families, particularly given that paucity of research in this area (e.g., Hurlburt et al., 2013). Rather than assume that interventions tested with low-income samples are ready to be implemented with a CW population, the current study acknowledges that the unique vulnerabilities of CW involved families may deleteriously impact treatment outcomes. By documenting such vulnerabilities (e.g. clinically significant levels of caregiver depressive symptoms) among the CW-involved sample in our study, and formally testing whether treatment effects are attenuated, this study provides supporting evidence that MFG effectiveness findings can be applied to CW involved families specifically. Notably, our study found significant treatment effects for the CW involved group for child behavior difficulties, while this has not been the consistent finding with other studies (Chaffin et al., 2004; Hurlburt et al., 2012). Moreover, this study's findings are generalizable to other low-resource community settings where MFG is likely to be implemented.

Limitations

Study limitations include the lack of randomized controlled design. We have made every attempt to address this challenge, by using a conservative Intent-to-Treat (ITT) analyses, carefully examining and accounting for any differences by treatment condition at baseline,

and utilizing mixed effects regression which maximizes analytical power when faced with missing data. An additional limitation is the broad definition of lifetime CW involvement obtained through provider self-report. Although such a heterogeneous definition was used in order to target those families with current or prior experiences with CW services, different maltreatment subtypes, investigation status, and recency of investigation may have differential impacts on outcomes (e.g., Petrenko, Friend, Garrido, Taussig, & Culhane, 2012). Unfortunately, this information was not measured in the current study. Families may not have willing or able to provide an accurate account of their CW involvement experience. The significant differential attrition at 6 months follow-up by treatment condition is another limitation. At the same time, further analyses revealed that Black/African American and Hispanic/Latino participants were more likely to respond than White/Caucasian participants. As the full sample was predominantly represented by ethnic minority participants, and there were no baseline demographic differences by treatment condition among those participants who did respond at 6 month follow-up, the threat of reduced sample representativeness seems unlikely. We also acknowledge that relying on single-item self-report measures (IRS items 1–6) is a shortcoming. The IRS, in particular, was chosen a low-burden measure with established convergence with longer measures of functional impairment (e.g., Fabiano et al., 2006). However, future studies would be strengthened by including more comprehensive measures of impairment or child functioning. Additional limitations include the exclusive use of parent-report measures of outcomes and the use block comparison design rather than true randomization procedures. Given the heterogeneity of SAU services received by participants, future research would benefit from comparing MFG vs. specific types of SAU services and dosage received (e.g., individual therapy, medication management, family therapy). Finally, this study is only generalizable to families where children reside with their permanent caregivers following a CW investigation. It is unknown how MFG would work for children in foster care.

Implications

Given the limitations of this study, further research is needed to increase reliance and interpretation of findings. Specifically, MFG should be tested exclusively with a CW population, using greater methodological controls, and exploring how different family level processes (e.g., parenting skills, parent-child relationships) are associated with child outcomes. Although addressing family-level processes was considered beyond the scope of the present study, the ABCX conceptual framework suggest possible avenues of exploration involving family-level mediators of the MFG treatment effect. Future planned manuscripts are currently under development to examine the impact of MFG on such family –level processes. Moreover, MFG may require adaptation to be delivered in certain non-mental health settings servicing CW populations (e.g., foster care agencies), which typically do not employ staff with extensive child mental health training. Greater justification for using MFG with a CW population will result if adapted versions maintain the original MFG core concepts while producing beneficial effects.

If successful, MFG would provide an effective alternative to other evidence-based, parent management interventions for child disruptive behavior disorders that have previously been tested with CW-involved families. Within under-resourced outpatient clinic settings, MFG

allows for a cost-effective means for multiple families to be seen simultaneously. Moreover, MFG represents a parent behavior management training intervention emphasizing a collaborative, empowerment-based, and engaging treatment model. Such features are particularly salient to for CW-involved families who often feel disempowered and coerced in to treatment services, struggle with tremendous amounts of stress and traumatic histories, and must navigate complex and conflict-laden service systems.

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Table 1
Demographic Characteristics and Risk Factors for Total Sample and by lifetime CW involvement status

Characteristic	Total Sample (n = 320)		CW-involved (n = 129)		non-CW-involved (n = 191)	
	n	%	n	%	n	%
Child age in years (mean ± SD)	302	8.9 ± 1.4	124	8.8 ± 1.3	178	8.9 ± 1.5
Caregiver age in years (mean ± SD)	310	36.5 ± 8.7	128	35.9 ± 8.4	182	36.9 ± 8.9
Child gender						
Male	217	67.8	84	65.1	133	69.6
Female	95	29.7	44	34.1	51	26.7
Child ethnicity ^{a,b}						
White/Caucasian	25	7.8	15	11.6	10	5.2
Black/African American	95	29.7	44	34.1	51	26.7
Hispanic/Latino	156	48.8	52	40.3	104	54.5
Other	30	9.4	13	10.1	17	8.9
Family income						
Less than \$9,999	125	39.1	54	41.9	71	37.2
\$10,000 – \$19,999	81	25.3	29	22.5	52	27.2
\$20,000 – \$29,999	47	14.7	21	16.3	26	13.6
\$30,000 – \$39,999	23	7.2	12	9.3	11	5.8
over \$40,000	22	6.9	4	3.1	18	9.4
Primary Caregiver						
Mother	252	78.8	103	79.8	149	78
Father	6	1.9	4	3.1	2	1
Grandparent	14	4.4	7	5.4	7	3.7
Mother and father	24	7.5	10	7.8	14	7.3
Other	14	4.4	4	3.1	10	5.2
Caregiver marital status						
Single	137	42.8	59	45.7	78	40.8
Married or cohabitating	105	32.8	35	27.1	70	36.6
Divorced	14	4.4	8	6.2	6	3.1

Characteristic	Total Sample (n = 320)		CW-involved (n = 129)		non-CW-involved (n = 191)	
	n	%	n	%	n	%
Separated	44	13.8	21	16.3	23	12
Widowed	7	2.2	1	0.8	6	3.1
Other	4	1.3	3	2.3	1	0.5
Caregiver education status						
Less than High School	123	38.4	50	38.8	73	38.2
Completed High School and more	197	61.6	79	61.2	118	61.8
Caregiver employment status^{*c}						
Not employed full time	245	76.6	107	83	138	72.3
Employed full-time	75	23.4	22	17.1	53	27.8
Depressive Symptoms clinical status^{*d}						
Clinically significant	169	52.8	78	60.5	91	47.6
Not Clinically significant	120	37.5	41	31.8	79	41.4
Parenting Stress clinical status						
Clinically significant	183	57.2	83	64.3	100	52.4
Not Clinically significant	99	30.9	33	25.6	66	34.6

^a.*** p < 0.01, * p < 0.05

Differences by CW status:

^b. $\chi^2 = 8.71$, df = 3, p = 0.03;

^c. $\chi^2 = 4.91$, df = 1, p = 0.03;

^d. $\chi^2 = 4.16$, df = 1, p = 0.04 % may not add up to 100 due to missing data

Table 2
Means and SD of outcomes by Treatment Condition, Assessment point and lifetime CW involvement status

Outcome	CW status	Multiple Family Group (MFG) Means (n = 225) (SD)					Services as usual (SAU) Means (n = 95) (SD)				
		Baseline n = 220	Mid-test n = 174	Post-test n = 177	6 month f/up n = 146	Baseline n = 95	Mid-test n = 70	Post-test n = 83	6 month f/up n = 75		
Oppositional Defiant Disorder (Iowa Crs ODD) ^a	CW	9.58 (3.47)	7.94 (3.66)	8.30 (3.52)	7.25 ^{**a} (3.67)	9.98 (3.63)	9.19 (3.07)	9.77 (3.67)	10.00 ^{**a} (3.69)		
	non-CW	9.09 (3.30)	7.60 (3.62)	7.44 (3.84)	7.47 (4.00)	8.26 (3.61)	7.43 (3.81)	8.28 (3.84)	7.74 (4.08)		
Social skills (SSRS-SSS)	CW	38.18 (10.47)	41.96 (11.68)	43.00 (13.79)	39.63 (10.61)	38.70 (10.94)	41.38 (13.26)	41.63 (11.66)	41.38 (13.26)		
	non-CW	38.32 (10.79)	44.46 (11.37)	43.39 (10.80)	39.68 (11.63)	40.63 (10.68)	41.63 (11.66)	41.63 (11.66)	41.63 (11.66)		
Impairment with playmates (IRS #1) ^b	CW	3.56 (1.47)	3.03 (1.58)	3.03 (1.58)	2.47 ^{*b} (1.14)	3.69 (1.47)	3.10 (1.14)	3.19 ^{*b} (1.37)	3.19 ^{*b} (1.37)		
	non-CW	3.62 (1.48)	2.91 (1.41)	2.91 (1.41)	2.80 (1.33)	3.63 (1.39)	2.86 (1.52)	3.03 (1.35)	3.03 (1.35)		
Impairment with parents (IRS #2) ^d	CW	3.89 (1.44)	3.24 (1.45)	3.24 (1.45)	2.81 (1.39)	3.51 (1.44)	2.92 (1.30)	2.86 (1.50)	2.86 (1.50)		
	non-CW	3.92 ^{*d} (1.47)	2.94 (1.49)	2.94 (1.49)	2.93 (1.31)	3.42 ^{*d} (1.41)	3.02 (1.42)	3.08 (1.31)	3.08 (1.31)		
Impairment with academics (IRS #3)	CW	3.83 (1.63)	3.38 (1.55)	3.38 (1.55)	3.06 (1.34)	4.13 (1.63)	3.62 (1.41)	3.25 (1.27)	3.25 (1.27)		
	non-CW	4.15 (1.49)	3.31 (1.56)	3.31 (1.56)	3.29 (1.41)	4.19 (1.41)	3.49 (1.65)	3.46 (1.33)	3.46 (1.33)		
Impairment with self-esteem (IRS #4)	CW	3.90 (1.46)	3.24 (1.45)	3.24 (1.45)	2.96 (1.39)	4.02 (1.36)	3.46 (1.31)	3.39 (1.36)	3.39 (1.36)		
	non-CW	3.98 (1.47)	3.12 (1.54)	3.12 (1.54)	3.04 (1.32)	3.50 (1.50)	3.40 (1.55)	3.51 (1.35)	3.51 (1.35)		

Outcome	CW status	Multiple Family Group (MFG) Means (n = 225) (SD)				Services as usual (SAU) Means (n = 95) (SD)			
		Baseline n = 220	Mid-test n = 174	Post-test n = 177	6 month f/up n = 146	Baseline n = 95	Mid-test n = 70	Post-test n = 83	6 month f/up n = 75
Impairment with family (IRS#5) ^{c,e}	CW	4.21 ^{*c} (1.32)	3.23 (1.53)	3.13 (1.37)	3.60 ^{*c} (1.48)	3.21 (1.30)	3.22 (1.31)		
	non-CW	4.12 ^{*e} (1.45)	3.37 (1.45)	3.20 (1.25)	3.54 ^{*e} (1.40)	3.26 (1.45)	3.44 (1.27)		
Overall Impairment/need for services (IRS#6)	CW	4.56 (1.18)	3.52 (1.35)	3.31 (1.24)	4.51 (1.06)	3.77 (1.35)	3.83 (1.22)		
	non-CW	4.61 (1.14)	3.48 (1.36)	3.26 (1.28)	4.40 (1.07)	3.60 (1.43)	3.59 (1.14)		

*** p < 0.01,

* p < 0.05

CW only: MFG vs. SAU -

^a. 6 month f/up: t = -3.45, p < 0.01;

^b. 6 month f/up: t = -2.71, p = 0.01;

^c. Baseline: t = 2.38, p = 0.02 non-CW only; MFG vs SAU -

^d. Baseline: t = 2.06, p = 0.04;

^e. Baseline: t = 2.38, p = 0.02

Table 3

Multivariate regression model parameters for outcome variables

	Outcome Variables							
	ODD		SSRS-SSS		IRS #1		IRS #2	
	b	SE	b	SE	b	SE	b	SE
Intercept	7.86	0.94 **	37.27	3.09 **	3.91	0.35 **	3.53	0.38 **
Condition	0.93	0.63	-0.82	1.96	0.00	0.24	0.41	0.25
Caregiver Age	0.01	0.02	0.06	0.07	-0.01	0.01	0.00	0.01
Mid-test dummy	-0.57	0.63						
Post-test dummy	0.46	0.60	0.91	1.64	-0.72	0.24 **	-0.46	0.25
6 mo F/u dummy	-0.05	0.60	1.45	1.69	-0.54	0.25 *	-0.36	0.26
Condition X Mid	-0.80	0.73						
Condition X Post	-2.15	0.70 **	4.73	1.95 *	-0.03	0.28	-0.48	0.30
Condition X 6 mo F/u	-1.50	0.72 *	4.02	2.04 *	-0.30	0.30	-0.63	0.31 *
Child Welfare (CW)	1.83	0.79 *	0.71	2.44	-0.02	0.30	-0.01	0.32
CW X Condition	-1.28	0.95	-1.30	2.96	-0.07	0.36	-0.02	0.38
CW X Mid	-0.32	0.91						
CW X Post	-0.85	0.86	-1.64	2.38	0.18	0.35	-0.13	0.36
CW X 6 mo F/u	-0.30	0.88	0.54	2.44	-0.02	0.36	-0.37	0.37
CW X Condition X Mid	0.21	1.09						
CW X Condition X Post	1.42	1.05	-0.79	2.93	0.03	0.43	0.42	0.44
CW X Condition X 6 mo F/u	-0.28	1.09	-2.60	3.05	-0.27	0.44	0.34	0.46

	Outcome Variables							
	IRS #3		IRS #4		IRS #5		IRS #6	
	b	SE	b	SE	b	SE	b	SE
Intercept	4.29	0.38 **	3.73	0.39 **	3.67	0.39 **	4.39	0.33 **
Condition	-0.04	0.26	0.45	0.26	0.55	0.25 *	0.19	0.22
Caregiver Age	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01

	Outcome Variables											
	IRS #3		IRS #4		IRS #5		IRS #6					
	b	SE	b	SE	b	SE	b	SE				
Mid-test dummy												
Post-test dummy	-0.70	0.26 **	-0.21	0.25	-0.27	0.23	-0.80	0.23 **				
6 mo F/u dummy	-0.70	0.27 **	-0.02	0.26	-0.06	0.24	-0.79	0.24 **				
Condition X Mid												
Condition X Post	-0.15	0.30	-0.67	0.29 *	-0.45	0.27	-0.28	0.27				
Condition X 6 mo F/u	-0.15	0.32	-0.91	0.31 **	-0.83	0.29 **	-0.52	0.28				
Child Welfare (CW)	-0.08	0.31	0.38	0.32	-0.03	0.32	0.06	0.28				
CW X Condition	-0.23	0.38	-0.50	0.38	0.08	0.38	-0.08	0.33				
CW X Mid												
CW X Post	0.21	0.38	-0.33	0.36	-0.14	0.34	0.07	0.33				
CW X 6 mo F/u	-0.20	0.39	-0.59	0.37	-0.37	0.35	0.16	0.34				
CW X Condition X Mid												
CW X Condition X Post	0.17	0.46	0.50	0.44	-0.10	0.41	-0.03	0.40				
CW X Condition X 6 mo F/u	0.21	0.48	0.53	0.46	0.25	0.43	-0.12	0.42				

* p < 0.05,

** p < 0.01

ODD = Iowa Connors Oppositional/Defiant Subscale; SSRS-SSS = Social Skills Rating Scale Social Skills Subscale; IRS #1 = Impairment Rating Scale Impairment with Playmates; IRS #2 = Impairment Rating Scale Impairment with parents; IRS #3 = Impairment Rating Scale Impairment with Academics; IRS #4 = Impairment Rating Scale Impairment with Self-Esteem; IRS #5 = Impairment Rating Scale Impairment with family; IRS #6 = Impairment Rating Scale Overall Impairment/Need for Services

Table 4
 Tests of differences between treatment conditions (MFG vs. SAU) by lifetime child welfare involvement status

Outcome Variable	n	Assessment	Child Welfare Involved				Non-Child Welfare Involved					
			Contrast Estimate (b)	SE	Z	p	Effect Size (Cohen's d)	Contrast Estimate (b)	SE	Z	p	Effect Size (Cohen's d)
ODD	306	Mid-test	-0.94	0.77	-1.22	0.22	0.27	0.13	0.70	0.19	0.85	0.04
		Post-test	-1.08	0.74	-1.46	0.15	0.31	-1.23	0.67	-1.83	0.07	0.35
		6 month F/u	-2.13	0.78	-2.74	0.01 *	0.61	-0.57	0.69	-0.83	0.41	0.16
SSRS-SSS	302	Post-test	1.83	2.36	0.78	0.44	0.17	3.91	2.05	1.90	0.06	0.36
		6 month F/u	-0.70	2.43	-0.29	0.77	0.06	3.20	2.14	1.50	0.13	0.30
IRS#1	309	Post-test	-0.07	0.29	-0.23	0.82	0.05	-0.03	0.25	-0.11	0.91	0.02
		6 month F/u	-0.64	0.30	-2.11	0.03 *	0.44	-0.30	0.27	-1.11	0.27	0.20
IRS #2	308	Post-test	0.34	0.31	1.08	0.28	0.23	-0.06	0.27	-0.22	0.82	0.04
		6 month F/u	0.11	0.32	0.34	0.74	0.07	-0.21	0.28	-0.75	0.46	0.15
IRS #3	309	Post-test	-0.26	0.31	-0.84	0.40	0.18	-0.20	0.27	-0.72	0.47	0.13
		6 month F/u	-0.21	0.32	-0.67	0.50	0.15	-0.19	0.29	-0.67	0.50	0.13
IRS #4	309	Post-test	-0.22	0.31	-0.70	0.49	0.15	-0.22	0.27	-0.83	0.41	0.15
		6 month F/u	-0.43	0.32	-1.31	0.19	0.29	-0.46	0.29	-1.62	0.10	0.32
IRS #5	309	Post-test	0.08	0.31	0.27	0.78	0.06	0.10	0.27	0.37	0.71	0.07
		6 month F/u	0.05	0.32	0.15	0.88	0.03	-0.28	0.28	-1.00	0.32	0.20
IRS #6	309	Post-test	-0.19	0.27	-0.69	0.49	0.17	-0.08	0.24	-0.35	0.72	0.07
		6 month F/u	-0.52	0.29	-1.83	0.07 +	0.47	-0.32	0.25	-1.29	0.20	0.29

* p < 0.05,

** p < 0.01

ODD = Iowa Connors Oppositional/Defiant Subscale; SSRS-SSS = Social Skills Rating Scale Social Skills Subscale; IRS #1 = Impairment Rating Scale Impairment with Playmates; IRS #2 = Impairment Rating Scale Impairment with parents; IRS #3 = Impairment Rating Scale Impairment with Academics; IRS #4 = Impairment Rating Scale Impairment with Self-Esteem; IRS #5 = Impairment Rating Scale Impairment with family; IRS #6 = Impairment Rating Scale Overall Impairment/Need for Services