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System-Level Effects of Integrating a Promising Treatment into JDCs

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Abstract

This study examined the system-level effects of implementing a promising treatment for adolescent substance abuse in juvenile drug courts (JDCs). Six JDCs were randomized to receive training in the experimental intervention (contingency management-family engagement, CM-FAM) or to continue their usual services (US). Participants were 104 families served by the courts, 51 therapists, and 74 JDC stakeholders (e.g., judges, prosecutors, defense attorneys). Assessments included repeated measurements of CM-FAM implementation by therapists as well as therapist and stakeholder perceptions of incentive-based interventions and organizational characteristics. Results revealed greater use of CM and family engagement techniques among CM-FAM relative to US therapists. In addition, therapists and stakeholders in the CM-FAM condition reported more favorable attitudes toward the use of incentives and greater improvement on several domains of organizational functioning relative to US counterparts. Taken together, these findings suggest that JDC professionals' are amenable to the adoption and implementation of a treatment model that holds promise for improving youth outcomes.

Keywords

Contingency management; substance use; drug court; adolescent; family

1. Introduction

The primary purpose of this report is to examine the system-level effects of integrating a promising treatment for youth substance abuse (contingency management-family engagement, CM-FAM) into several juvenile drug courts (JDCs). A previous report (Henggeler, McCart, Cunningham, & Chapman, 2011) described the favorable reductions in juvenile offender substance use and criminal behavior resulting from the CM-FAM intervention. The achievement of improved clinical outcomes, however, is only one factor in the successful transport of evidence-based treatments to field settings (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). For effectiveness and sustainability, therapists must learn to implement the treatment with fidelity, stakeholders must come to view the

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intervention favorably, and the organization in which the intervention is embedded must adjust to the integration of the new treatment methods. The present report evaluated these changes using a design in which several JDCs were randomized to receive training in CM-FAM or not. Before the specifics of the study are presented, however, the broader context in which this study fits into the JDC field and the validation of the CM-FAM protocol (Henggeler et al., 2012) are described.

Juvenile offenders with substance abuse problems represent a large and underserved population that is at high risk of presenting significant deleterious outcomes and long-term costs for themselves, their families and communities, and society (Belenko & Dembo, 2003; Chassin, 2008). Based, in part, on the success of their adult drug court counterparts (General Accountability Office, 2005), JDCs were developed in the early 1990s to address the significant treatment needs of juvenile offenders with substance abuse problems. Indeed, with considerable local, state, and federal support, more than 500 JDCs are currently operating in the U.S. (Bureau of Justice Assistance Drug Court Clearing House, 2009) and stakeholders hope to further increase the availability of the JDC model across the nation (“Record funding for drug court!!!,” 2009).

As is often the case in the field of juvenile justice, however, the proliferation of promising interventions, JDCs in the present case, has preceded rigorous evaluation of their effectiveness (Howell, 2003; Greenwood, 2006). Unfortunately, meta-analytic reviews of JDC evaluations have produced mixed results (Aos, Miller, & Drake, 2006; Shaffer, 2006), with a reported mean effect size of only .05 favoring JDC. However, these studies also reported significant variability in the observed effect size estimates, suggesting that some courts are more successful than others at reducing youth substance use and delinquent behavior. In examining this literature, several reviewers (e.g., Belenko & Logan, 2003; Chassin, 2008; Henggeler, 2007; Hills, Shufelt, & Cocozza, 2009) have suggested that the effectiveness of JDCs has been attenuated by their general difficulty in involving parents and caregivers in the treatment process (see e.g., Salvatore, Henderson, Hiller, White, & Samuelson, 2010) and by a failure to adopt and integrate evidence-based substance abuse treatment practices into the treatment component of JDC. Indeed, the importance of caregiver involvement in effective treatment for adolescent substance abuse is well established (e.g., Waldron & Turner, 2008; Williams & Chang, 2000), and the science-service gap is substantial in the field of substance abuse treatment (Carroll, Martino, & Rounsaville, 2010; Compton et al., 2005; Institute of Medicine, 1998).

In an effort to test and enhance the effectiveness of JDC by integrating an evidence-based family treatment, Henggeler et al. (2006) conducted a four-condition clinical trial in which substance abusing juvenile offenders were randomized to family court, usual JDC, JDC with an evidence-based family treatment (i.e., multisystemic therapy, MST; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009), or JDC with MST + CM integrated as the treatment component. Supporting the view that increased family involvement and integration of evidence-based treatments could improve JDC outcomes, the two JDC conditions with the evidence-based substance abuse treatments were more effective than usual JDC (and family court) at decreasing adolescent substance use. Although these results were promising, the complexity and cost of MST programs (e.g., a minimum of two full-time therapists and a half-time supervisor, extensive quality assurance procedures) serves as a barrier to the wider transport of this intervention model to JDCs, many of which serve only small numbers of youths. Clearly, a family friendly and more efficient approach is needed – ideally, one that can be integrated into a range of existing JDC treatment services.

CM with enhanced strategies for family engagement (CM-FAM) might represent a logical choice to fill this need. CM and its variations have strong empirical support in the adult

substance abuse literature (Higgins, Silverman, & Heil, 2008) and very promising outcomes in the adolescent substance abuse literature (Stanger & Budney, 2010); and, as noted previously, CM enhanced youth substance use outcomes in the aforementioned JDC study (Henggeler et al., 2006). Moreover, due to its relative simplicity, low cost, and compatibility with current JDC practice (i.e., frequent drug testing with consequences), CM seems more amenable to adoption (Rogers, 1995) by JDC professionals than are other evidence-based treatments of adolescent substance abuse such as MST, multidimensional family therapy, and brief strategic family therapy. Indeed, Henggeler, Chapman et al., (2007; 2008) demonstrated widespread interest in and adoption of CM by public sector practitioners in substance abuse and mental health when provided appropriate training and support. To promote family participation in CM, the effective family engagement strategies used in MST (Henggeler, 2011) have been integrated into the CM protocol. The resulting intervention is labeled CM-FAM and specified in a treatment manual (Henggeler et al., 2012).

As indicated previously, the present manuscript is the second report from a larger study that is evaluating the integration of CM-FAM into JDCs. The first report (Henggeler et al., 2011) focused on the effects of CM-FAM on youth outcomes. Six JDCs were randomized to a condition in which therapists were trained to deliver CM-FAM or to continue their usual services. Participants included 104 juvenile offenders, 86% of whom met criteria for at least one substance use disorder. Results showed that CM-FAM was significantly more effective than usual services at reducing youth marijuana use, based on urine drug screens, and at reducing crimes against persons and property offenses. The present manuscript examines the effects of integrating the CM-FAM intervention on the participating therapists, stakeholders, and organizations.

Reviewers and researchers (e.g., Aarons, Fettes, Flores, & Summerfeld, 2009; Beidas & Kendall, 2010; Fixsen et al., 2005) have noted that an organization's transition to an evidence-based practice likely involves change in practitioner behavior, stakeholder attitudes, and organizational processes – changes needed to support the implementation of the new treatment. To the best of our knowledge, however, few studies have examined such changes resulting from the integration of an evidence-based practice into an organization. One important exception is a recent study conducted by Aarons and colleagues (Aarons, Fettes, et al., 2009; Aarons, Sommerfeld, Hecht, Silovsky, & Chaffin, 2009) in which integration of an evidence-based practice into case management teams reduced staff turnover and emotional exhaustion in comparison with teams providing usual case management services. Aside from this study, the literature has focused almost exclusively on identifying those practitioner and organizational variables that are conducive (or serve as barriers) to the adoption of evidence-based practices. The present study, which randomizes JDCs to conditions and includes a longitudinal design, provides a rare opportunity to examine the impact of the adoption of a promising substance abuse treatment protocol. Specifically, we evaluated the effects of training in CM-FAM on therapist fidelity of treatment implementation, therapist and stakeholder perspectives on the use of incentives in treatment programs, and key aspects of organizational functioning.

Reviewers in the areas of substance abuse (e.g., Baer et al., 2007; Carroll et al., 2010; Miller, Sorensen, Selzer, & Brigham, 2006) and mental health (e.g., Beidas & Kendall, 2010; Fixsen et al., 2005) have generally concluded that relatively intensive training procedures are required to support the fidelity of therapist implementation of an evidence-based practice. In the present case, therapists in JDCs randomized to the CM-FAM condition received workshop training, resources to support the implementation of CM-FAM (i.e., manuals, incentives to use with clients), ongoing clinical supervision, and quarterly booster training. In light of the intensity of these training procedures, we hypothesized that these therapists would score significantly higher than therapists in the comparison JDCs on

measures that assessed the fidelity of both CM implementation and the use of family engagement strategies.

Reviewers of the dissemination of CM (e.g., Kirby, Benishek, Dugosh, & Kerwin, 2006; Petry & Simcic, 2002) have suggested that the provision of tangible incentives to substance abusing individuals can be viewed by therapists and stakeholders (i.e., judges, JDC coordinators, prosecutors, defense attorneys, juvenile justice personnel) as a barrier to the implementation of CM. In light of the established capacity of CM to reduce client substance use and the compatibility of CM protocols with JDC procedures (e.g., both include frequent drug testing and provision of consequences), we hypothesized that therapists and stakeholders in the JDCs randomized to the CM-FAM condition would show increased acceptance of using tangible incentives with substance abusing youths in comparison with counterparts in the comparison JDCs.

At the organizational level (Simpson & Flynn, 2007), we evaluated whether training in CM-FAM would lead to changed perspectives regarding perceived program needs and stakeholder openness to innovation. Based on the aforementioned favorable findings reported by Aarons and colleagues (Aarons, Fettes, et al., 2009; Aarons, Summerfeld, et al., 2009), we anticipated that the introduction of CM-FAM to JDCs would result in favorable changes at the organizational level. Thus, therapists and stakeholders in the CM-FAM condition were predicted to report decreased need for further clinical skill building to serve clients relative to counterparts in the usual services condition, and CM-FAM therapists were predicted to report higher satisfaction with their training than usual services counterparts. Similarly, in light of the positive associations between (a) staff adaptability and favorable attitudes toward treatment manuals (Fuller et al., 2007); and (b) organizational openness to change and client satisfaction with treatment (Greener, Joe, Simpson, Rowan-Szal, & Lehman, 2007) and therapist adoption of innovation (Simpson, Joe, & Rowan-Szal, 2007), therapists and stakeholders in the CM-FAM condition were hypothesized to report increased openness to innovation and willingness to try out new ideas than counterparts in the usual services condition.

In sum, the present study examines the system-level effects of integrating CM-FAM into several JDCs. Such research is important to understanding the full range of impacts, not just on clinical outcomes, when introducing a substance abuse treatment protocol to community settings.

2. Materials and methods

2.1. Design and Procedures

A randomized design was used to evaluate the effects of the CM-FAM intervention. Researchers partnered with six JDCs and their respective substance abuse provider agencies for the current project. In October 2008, three JDCs were randomly selected to receive training and ongoing support to implement CM-FAM for an 18-month period, while providers for the other three courts were randomized to deliver their usual substance abuse treatment services (US). Of note, two JDCs in the US condition were terminated due to a loss of funding -- one at 8 months following randomization and the other at 13 months post-randomization. In both cases, a replacement JDC was recruited for the US condition. Data from all courts were included in the analyses.

System-level outcomes were measured using a multi-method assessment battery. The measurement protocol was designed to obtain eight monthly reports from caregivers (via phone) on therapist implementation of the key components of CM-FAM (i.e., CM and family engagement techniques). For each of the eight monthly calls, the implementation

measures were only administered if the caregivers indicated that they had attended at least one of their youth's treatment sessions during the past month. Of note, to enhance our measurement of CM-FAM implementation, a decision was made nine months after the study began to supplement the monthly caregiver reports with analogous reports provided by participating youth. Self-report scales assessing therapist and JDC stakeholder perceptions of incentive-based interventions and organizational characteristics were administered bi-annually over a two-year period (i.e., four total administrations). The first two assessments occurred prior to randomization of the courts to the different intervention conditions and therefore represent "baseline" measurements. The third and fourth assessments occurred at 6 and 12 months post-randomization, respectively. The participating JDCs received \$5,000 during each year of the study as compensation for the time that therapists and stakeholders spent completing research measures and engaging in other research activities (e.g., referring families for study recruitment, attending periodic meetings with investigators). In addition, youth and caregivers were each paid \$5 for completing each of the monthly telephone surveys.

2.2. Participants and Recruitment

Recruitment procedures were approved by the institutional review board at the Medical University of South Carolina. As detailed in Henggeler et al. (2011), all youth (aged 12–17 years) entering drug court as new referrals between October 2008 and March 2010 ($N=115$) were eligible to participate in the study. Within two weeks of referral, research assistants met with youth and caregivers to describe the study and obtain informed consent. Consent forms emphasized that families were entitled to receive services from the JDC regardless of their participation in the research. One hundred and eleven families agreed to participate (97% recruitment rate). Seven families were lost to follow-up immediately after recruitment and prior to any data collection yielding a total of 104 participating families.

Informed consent from therapists and JDC stakeholders (i.e., judges, JDC coordinators, prosecutors, defense attorneys, juvenile justice personnel) was obtained by investigators at site visits conducted during the first year of the study. Prior to the site visits, a letter of introduction was sent to all therapists and stakeholders at the participating JDCs. The letter described the purpose of the study, emphasized the voluntary nature of the information requested, and indicated that the respondent could terminate participation at will. During site visits, the investigators explained that information regarding the participants' professional backgrounds and demographic characteristics would be obtained by survey at the initial assessment only; and that assessment of participant perceptions of incentives and organizational characteristics would be obtained bi-annually. All (100%) therapists ($N=51$) and JDC stakeholders ($N=74$) agreed to participate.

2.3. Intervention Conditions

The participating JDCs followed national guidelines for the conduct of drug court programs (National Association of Drug Court Professionals, 1997). The key distinction between intervention conditions pertained to whether the JDCs attempted to integrate CM-FAM into the substance abuse treatment component of drug court or delivered substance abuse treatment as usually provided for youths in the respective JDCs.

2.3.1. CM-FAM—A treatment manual (Henggeler et al., 2012) specifies the content and organization of the CM-FAM intervention. The CM portion is based on our experience delivering CM to substance abusing juvenile offenders (e.g., Henggeler et al., 2006) and training community-based practitioners (Henggeler, Chapman et al., 2008; Henggeler, Sheidow et al., 2008) in CM protocols. The intervention consists of several key components. (a) Clinical assessments determine whether the youth's substance use is experimental in

nature or reflects abuse or dependence. (b) If the substance use is problematic, the therapist introduces CM and attempts to engage the youth and family in treatment. (c) The therapist conducts a functional analysis of the youth's substance use in collaboration with the youth and caregivers. (d) Based on the results of the functional analysis, self-management planning and drug refusal skills training are implemented by the therapist in collaboration with the caregivers. (e) Concurrently, a contingency contract is developed by the youth and caregivers that provides desired rewards and privileges for clean drug and alcohol tests and disincentives for dirty drug and alcohol screens. In the present study, \$150 in vouchers was used to motivate initial abstinence, while natural incentives (e.g., access to cell phone; later curfew) were used to reward sustained abstinence. Components "c" through "e" are repeated until continued abstinence is achieved. (f) Finally, the therapist collaborates with caregivers and youths to develop plans for sustaining abstinence after treatment ends.

The family engagement portion of CM-FAM is based on engagement strategies used successfully in MST (Henggeler et al., 2009) and in other family-based treatments (e.g., functional family therapy, multidimensional treatment foster care) for adolescent offenders. The underlying assumption of these strategies is that treatment best progresses when key family members are engaged and actively participating in the treatment process -- helping to define problems, setting goals, and implementing interventions to meet those goals. Hence, practitioners work toward achieving strong engagement from the time of their first contact with the family. Key engagement strategies in the context of JDC include focusing on youth and family strengths when conceptualizing interventions, collaborating in the development of treatment goals and specification of therapeutic interventions, maintaining a non-blaming stance, and incorporating core clinical skills such as empathy, reflective listening, flexibility, and reframing.

2.3.2. Usual treatment services—Treatment services delivered at the JDCs randomized to the US condition were consistent with those provided in JDCs nationally. Initially, youths are typically required to attend group treatment for 1–2 days a week. The groups usually focus on promoting abstinence, anger/stress management, conflict resolution, and decision-making skills. At some JDCs, youths concurrently participate in family group treatment, with an emphasis on improving family communication. The theoretical orientations of the adolescent and family groups are usually cognitive-behavioral and system theory. Interventions are rarely manual driven, and selection of group material is often left to the therapist's discretion. Youths typically transition to less intensive treatment schedules 16–24 weeks after enrollment. The timing of this transition is generally determined by the JDC team and depends on the youth's number of clean urine drug screens and behavior in other areas. The less intensive services are usually maintained until participants graduate from the JDC program. Treatment services are typically office-based with little community outreach.

2.4. CM-FAM Training and Quality Assurance Protocol

Courts in the CM-FAM condition received training and ongoing quality assurance support from a doctoral-level expert. An initial 1.5-day workshop focused on orienting therapists and JDC stakeholders to program philosophy and intervention methods. The CM portion of the training followed that used successfully in our large scale transport of CM to community-based practitioners (Henggeler, Chapman et al., 2008), and the family engagement portion borrowed from corresponding protocols used to train therapists in MST. In addition, quarterly half- or 1-day booster trainings were provided for therapists in areas identified as presenting difficulties in adherence or achieving clinical outcomes (e.g., ensuring caregivers consistently implement home-based consequences based on the results of drug screens). Therapists at each CM-FAM court also received brief telephone consultation from the doctoral-level expert approximately twice per month. The calls

focused on promoting adherence to intervention principles and developing solutions to difficult clinical problems.

2.5. Outcome Variables

Key outcomes included therapist implementation of CM and family engagement techniques, therapist and stakeholder attitudes toward incentive-based interventions, and therapist and stakeholder reports regarding several key organizational characteristics.

2.5.1. Implementation measures—CM implementation was measured using both the caregiver- and youth-report versions of the CM-Therapist Adherence Measure (CM-TAM; Henggeler et al., 2006). In an initial evaluation of the CM-TAM, data from three CM studies were combined and analyzed (Chapman, Sheidow, Henggeler, Halliday-Boykins, & Cunningham, 2008). Results indicated that the instrument performed well, with items targeted to the sample, solid item reliability, and stable performance over repeated measurements. Areas identified for improvement included the wording of some items, the addition of items that would more fully define the continuum of therapist adherence to CM, and revision of the original 5-point rating scale. These modifications were implemented for the current study. The result is a 34-item revised instrument with a 4-point scale that assesses therapists' use of the two major components of CM: Cognitive-Behavioral interventions (19 items) such as functional analysis of substance use, self-management planning, and drug refusal skills training; and Monitoring interventions (15 items) such as regular drug screening and contingency contracting. Based on caregiver reports in the present sample, Cronbach's coefficient alphas were .80 and .78 for the Cognitive-Behavioral and Monitoring subscales, respectively. For the youth-report version of the CM-TAM, alphas were .86 and .57 for the Cognitive-Behavioral and Monitoring subscales, respectively.

Implementation of family engagement techniques was measured with the caregiver- and youth-report versions of the Family Engagement-Therapist Adherence Measure (FAM-TAM; Henggeler et al., 2006). Earlier work with the FAM-TAM indicated that the instrument had solid reliability, distinguished between family-based (i.e., MST) and comparison (i.e., usual community services) interventions, and was associated with important outcomes, including decreased youth substance use (Henggeler et al., 2006). To more fully define the continuum of therapist adherence to family engagement strategies, additional items were developed for the current study, and the 5-point rating scale was revised. The result is 30 items covering therapists' use of family engagement strategies that are rated on a 4-point scale. Items include, for example, "The therapist communicated with us in a respectful way," and "My family and the therapist agreed about the goals for treatment." Cronbach's alphas were high for the caregiver-report (.95) and youth-report (.97) versions of the FAM-TAM in the current sample.

2.5.2. Therapist and JDC stakeholder attitudes toward incentives—The Provider Survey of Incentives (PSI; Kirby et al., 2006) was used to assess therapist and JDC stakeholder attitudes toward the use of incentives in the treatment of substance abuse problems. Twenty-two parallel items on the PSI measure beliefs about tangible and social incentives. Participants read each item twice, once for tangible incentives and once for social incentives, and indicate their level of agreement using a 5-point Likert scale. Example items include, "Incentives are a bribe" and "A problem with incentives is that abstinence will only last for as long as the incentives are given." Research indicates that the PSI significantly distinguishes between practitioners with and without prior experience delivering CM protocols (Kirby et al., 2006). In the present sample, Cronbach's alphas for the Tangible Incentives (.87) and Social Incentives (.85) subscales were good.

2.5.3. Organizational characteristics—Organizational characteristics were assessed using select subscales from the Organizational Readiness for Change (ORC; Lehman, Greener, & Simpson, 2002). The ORC was developed to assess an organization's resources and readiness to try new substance abuse interventions. The ORC has been adapted for use with different types of respondents. In the current study, therapists completed subscales from the ORC-Treatment Staff version (ORC-S) and JDC stakeholders completed subscales from the ORC-Criminal Justice version (ORC-CJ). The two versions are similar in content, with only minor wording changes designed to make items more appropriate from either a counseling or criminal justice supervisory perspective. The following three subscales were administered from both the ORC-S and ORC-CJ: Program Needs (8 items measuring perceptions of need for further skill-building to serve clientele), Adaptability (4 items measuring the respondent's willingness to try out new ideas), and Change (5 items measuring the respondent's openness to innovation and new technologies and procedures). In addition, therapists completed a fourth subscale on the ORC-S labeled Training Satisfaction (2 items measuring satisfaction with the training received for a new intervention). A CM study involving 543 practitioners provided support for the convergent (Saldana, Chapman, Henggeler, & Rowland, 2007) and predictive (Henggeler et al., 2007) validity of the ORC instrument. Specifically, Saldana et al. reported positive associations between ORC scale scores and measures of practitioner attitudes toward evidence-based practices, and Henggeler et al. reported that several ORC scales predicted practitioner attendance at a CM workshop. Moreover, research has shown that the ORC has satisfactory reliability (Lehman et al., 2002). Based on therapist reports in the current sample, Cronbach's alphas were .81, .69, .68, and .91 for the Program Needs, Adaptability, Change, and Training Satisfaction subscales, respectively. Based on JDC stakeholder reports, alphas were .88, .53, and .78 for the Program Needs, Adaptability, and Change subscales, respectively.

2.6. Statistical Analysis

2.6.1. Interview completion—Of the 104 participating caregivers, 83 (80%) completed at least one CM- and FAM-TAM ($M = 3.35$, $SD = 2.03$). The remaining 21 caregivers indicated that they did not attend any of their youth's treatment sessions and were therefore never eligible to complete the implementation measures. As noted previously, a decision was made nine months into the study to begin supplementing caregiver TAMs with analogous reports from participating youth. Due to this delayed initiation of TAM administration, only 63 youth were eligible to complete the implementation measures. Of these 63 youth, all (100%) completed at least one CM- and FAM-TAM ($M = 2.98$, $SD = 1.74$). Of the 51 therapists and 74 JDC stakeholders, all (100%) completed at least one research assessment ($M = 2.06$, $SD = 0.83$).

2.6.2. Data structure and analysis—Analyses were performed using mixed-effects regression models (MRMs; Raudenbush & Bryk, 2002). Two-level MRMs with t repeated measurements (level-1; CM- and FAM-TAM $n_{ij} = 8$ [max.], PSI $n_{ij} = 4$ [max.], and ORC $n_{ij} = 4$ [max.]) nested within i respondents (level-2; $n_{(caregiver)} = 83$, $n_{(youth)} = 63$, $n_{(professional)} = 125$) were estimated using HLM software (version 6.08; Raudenbush, Bryk, & Congdon, 2004). MRMs were performed using Restricted Maximum Likelihood estimation, random effects were specified according to the deviance test, and significance testing was conducted using the Wald test. Due to the limitations of standardized effect size estimates from MRMs, 95% confidence intervals were computed for each coefficient as estimates of the unstandardized effect size (American Psychological Association, 2008; Fidler et al., 2005).

2.6.3. Family-reported implementation outcomes—Youth and caregiver reports of each of three CM-FAM implementation outcomes were analyzed separately (i.e., 6 models). To test for change over time, a linear polynomial term was computed as the number of months between each family's assessment date and their first post-randomization assessment date and entered uncentered at level-1. A dummy-coded intervention condition indicator (0 = US, 1 = CM-FAM) was entered as a main effect at level-2 and as a cross-level interaction term with the level-1 linear term.

2.6.4. Drug court professional-reported implementation outcomes—Each drug court professional (i.e., therapists and stakeholders) provided reports of the two PSI outcomes and either the S or CJ version of the ORC (i.e., 9 models). To address the hypotheses, dummy-coded indicators for the Month 6 and Month 12 post-randomization assessments were included in the level-1 model. A dummy-coded intervention condition indicator was included at level-2 along with cross-level interaction terms with the level-1 indicators.

3. Results

3.1. Participant characteristics

Analyses revealed no associations between intervention condition and the demographic characteristics of youth and caregivers, therapists, or JDC stakeholders (all p -values > .05). Therefore, these characteristics are presented for the full samples.

3.1.1. Youths and caregivers—Thirty-nine youths and 52 caregivers were served by courts in the CM-FAM condition and 24 youths and 31 caregivers were served by courts in the US condition. In total, the 63 participating youths averaged 15.4 years of age ($SD = 0.97$ years), and 87% were male. The racial breakdown of the adolescent sample was 59% white, 36% African American, and 5% biracial. Approximately 3% of the sample was Hispanic (of any race). Only 14% of the youths lived with both biological parents, whereas 17% lived with a biological parent and another adult, 54% with a single biological parent, and 15% with other relatives. The mean age of the 83 participating caregivers was 42.8 years ($SD = 7.94$ years); 87% were female; and 62% were white, 36% African-American, and 2% biracial. The median annual household income reported by caregivers was in the \$20,000–\$30,000 range. Approximately 46% of families were receiving some sort of financial assistance, and the median educational attainment of the caregivers was 12th grade. Overall, these data indicate that the participating families were economically disadvantaged.

3.1.2. Therapists—Twenty-six therapists provided treatment services at courts in the CM-FAM condition and 25 provided services at JDCs in the US condition. The mean age of the 51 therapists was 41.7 years ($SD = 11.8$ years), 77% were female, 61% were white, and 39% were African American. Professionally, 29% had bachelor's degrees only, 69% had master's degrees, and 2% had doctorate degrees. Sixty-seven percent of the practitioners reported a history of formal training in CBT. The therapists had an average of 11 years of applied clinical experience, and 44% were certified addictions counselors.

3.1.3. JDC stakeholders—This sample included 54 stakeholders from the CM-FAM courts and 20 stakeholders from the US courts. Consistent with the multidisciplinary make-up of drug court teams nationally, the 74 total stakeholders included judges ($n = 11$), coordinators/administrators ($n = 16$), prosecutors ($n = 11$), public defenders ($n = 10$), probation officers ($n = 9$), law enforcement officials ($n = 6$), and case managers/social workers ($n = 11$). The mean age of stakeholders was 46.2 years ($SD = 10.98$ years). Approximately 53% were male, 65% were white, and 35% were African American. Overall,

the stakeholders had an average of 10 years experience working in the juvenile justice field and an average of 2 years experience working in JDCs.

3.2. Implementation Outcomes

The results of the caregiver- and youth-reported CM-TAM and FAM-TAM analyses are reported in Table 1 and are summarized below. These analyses tested for condition differences in initial implementation of CM-FAM components and in the rates of change over time.

3.2.1. CM-TAM—The US and CM-FAM conditions did not differ significantly on the initial level of Cognitive-Behavioral or Monitoring intervention implementation according to either caregiver or youth reports. However, the conditions demonstrated differential rates of change over time. Implementation for the CM-FAM condition increased over time at a level that deviated significantly from the US condition for Cognitive-Behavioral (based on caregiver [$p = .009$] and youth [$p = .013$] reports) and Monitoring (based on caregiver report only [$p = .005$]) interventions. In contrast, implementation in the US condition was constant for both Cognitive-Behavioral (i.e., caregiver slope = -0.01 , youth slope = -0.02) and Monitoring (i.e., caregiver slope = 0.01 , youth slope = 0.03) interventions. Thus, therapists in the CM-FAM condition showed significantly increasing use of the cognitive behavioral and monitoring components of CM-FAM, whereas US counterparts did not change.

3.2.2. FAM-TAM—The US and CM-FAM conditions differed significantly on the initial level of Family Engagement implementation according to both caregiver and youth reports, with CM-FAM being 0.22 and 0.51 points lower than US according to caregivers and youth. The rates of change also differed by condition. As above, Family Engagement implementation was mostly constant for the US condition (i.e., caregiver slope = -0.01 , youth slope = -0.03). However, for the CM-FAM condition, implementation increased over time at a level that deviated significantly from the US group (based on both caregiver [$p = .015$] and youth [$p = .001$] reports). Thus, therapists in the CM-FAM condition also showed significantly increasing use of evidence-based family engagement strategies, whereas US counterparts did not change.

3.3. Attitudes Toward Incentives and Organizational Characteristics

Table 2 presents descriptive data for the PSI and ORC by condition and assessment occasion. Analyses examining between-groups differences in the change of these outcomes from baseline to Months 6 and 12 are reported in Table 3 and summarized below.

3.3.1. PSI—Baseline perceptions of Tangible and Social Incentives did not differ significantly by condition. Likewise, the two conditions did not differ in the amount of change between baseline and Month 6 for either outcome. However, from baseline to Month 12, a significant between-groups difference emerged for the Tangible Incentives subscale reflecting a greater increase in scores for CM-FAM relative to US ($p = .043$). Thus, both therapists and JDC stakeholders in the CM-FAM condition came to view the use of tangible incentives, such as those used in CM-FAM, more favorably by Month 12 than did counterparts in the US condition.

3.3.2. ORC—Based on therapist reports, there were no condition differences at baseline or in the change from baseline to Month 6 on any of the ORC subscales. From baseline to Month 12, there were no condition differences in change for the Adaptability or Change subscales. However, from baseline to Month 12, significant between-group differences emerged in the change for Program Needs ($p = .001$) and Training Satisfaction ($p = .001$). Indeed, inspection of the mean scores in Table 2 indicate that across the 12-month follow-

up, CM-FAM therapists reported a reduction in perceived Program Needs and an increase in Training Satisfaction. In contrast, US therapists reported increased Program Needs and reduced Training Satisfaction over this same time period. Thus, therapists in the CM-FAM condition reported a decreased need for program improvement and higher satisfaction with their training at Month 12 than did US counterparts.

Based on reports from JDC stakeholders, there were no condition differences at baseline or in the change from baseline to Month 6 on any ORC subscale. From baseline to Month 12, there was no condition difference in the change for perceived Program Needs. However, results revealed a significant between-groups difference for Adaptability from baseline to Month 12 ($p = .035$). As shown in Table 2, JDC stakeholders in the CM-FAM condition reported an increase in Adaptability scores across the 12-month follow-up whereas the corresponding scores for stakeholders in the US condition decreased. Thus, judges, prosecutors, public defenders and other JDC stakeholders became more willing to try out new ideas by Month 12 in comparison with counterparts in the US JDCs.

3.4. Adjustment for Nesting

Participants were nested within drug courts; however, there were too few courts to support a random effect for formal significant testing (Maas & Hox, 2005). Therefore, as a follow-up to the results presented above, exploratory GEE-based models were performed with a random effect for drug court membership. The goal of the models was to evaluate whether conclusions change when controlling for differences in outcomes across courts. Importantly, all TAM, PSI, and ORC findings were maintained in the GEE-based models. This provides evidence that the variance in the outcomes attributable to courts was relatively small.

4. Discussion

Overall, the results suggest that integration of the promising CM-FAM treatment protocol into JDCs is feasible and also acceptable to the therapists and professionals working in this juvenile justice setting. Therapists in JDCs that received training in CM-FAM evidenced greater use of family engagement strategies and the key components of CM than did US counterparts. In addition, therapists and other JDC stakeholders in the CM-FAM condition reported more favorable attitudes toward the use of incentives, a critical component of CM, in treatment than did therapists and stakeholders in the US condition. Significant effects were evidenced by the organizational measures as well, with the therapists trained in CM-FAM reporting lower need for effective treatment services and greater satisfaction with their training through 12 months post baseline, compared to therapists who did not receive specialized CM-FAM training. Similarly, JDC stakeholders (e.g., judges, prosecutors, drug court coordinators) in the CM-FAM condition increased their adaptability (i.e., openness to new ideas) in comparison with stakeholders in the US condition. Together, and consistent with the new and emerging literature on the organizational effects of integrating evidence-based practices into provider organizations (Aarons, Fettes, et al., 2009; Aarons, Sommerfeld, et al., 2009), the findings suggest that integration of a promising substance abuse treatment had positive effects at multiple levels of analysis – practitioner attitudes and behavior as well as organizational functioning. Such results are encouraging for the proponents of evidence-based practices.

As noted previously, reviewers (e.g., Beidas & Kendall, 2010; Baer et al., 2007; Fixsen et al., 2005; Miller et al., 2006) have generally concluded that intensive training procedures are needed to support practitioner use of evidence-based practices in real world clinical settings. Although the present study did not evaluate differential effects of varying degrees of training intensity (e.g., Miller, Yahne, Moyers, Martinez, & Pirritano, 2004), the findings did demonstrate that a relatively intensive approach (i.e., provision of workshop, manuals,

resources for using CM, brief bi-weekly phone support, quarterly booster training) was effective in supporting therapist implementation of an evidence-based intervention. Importantly, support for this finding was based on caregiver and youth reports, which supports the validity of findings as therapist reports have been shown to overestimate actual implementation of evidence-based techniques (Miller & Mount, 2001). Although relatively intensive, the present training and quality assurance protocol is considerably less demanding than those used to support the fidelity and transport of other evidence-based treatments such as MST (e.g., Schoenwald, Sheidow, & Chapman, 2009) and the behavioral interventions examined in studies sponsored by the National Institute on Drug Abuse-funded Clinical Trials Network (Baer et al., 2007). In combination with the high therapist satisfaction with CM-FAM training observed for this study and the favorable clinical outcomes for youths (see Henggeler et al., 2011), the results suggest that the current training and quality assurance protocol might serve as a model for the efficient transport of interventions that are not extremely complex.

The observed changes in therapist and stakeholder attitudes toward the use of incentives in substance abuse treatment and stakeholder adaptability also support the viability of the training and quality assurance protocol used to transport CM-FAM to the JDCs. Consistent with the survey results reported by Kirby et al. (2006), the therapists (and stakeholders in the present case) were receptive and held many positive beliefs toward the use of tangible incentives in treating substance abuse. Moreover, as hypothesized by Kirby and colleagues, favorable attitudes toward the use of tangible incentives increased as these professionals (in the CM-FAM condition) experienced how incentives can be flexibly used. We should note, however, that JDC stakeholders are likely more amenable than other community-based providers to the use of incentives due to their organizational context (i.e., JDC judges already use tangible incentives and disincentives on a regular basis). Similarly, consistent with theory (Simpson & Flynn, 2007) and correlational research on adaptability in substance abuse treatment organizations (e.g., Fuller et al., 2007), the integration of CM-FAM led to an increase in stakeholder (though not therapist) ability to adapt effectively to new ideas and change. It can be argued, however, that therapist changes in clinical behavior, as demonstrated through caregiver and youth fidelity ratings, also provide a substantive demonstration of their capacity to adapt effectively to new ideas and change.

4.1. Limitations and future directions

Several limitations should be noted, and these have implications for future directions in research. First, the sustainability of the observed system-level effects is not known. The present effects were observed after 1 year of training in CM-FAM. Is continuous quality assurance support required to sustain therapist implementation fidelity and organizational changes, or might changes be self-sustaining after training support is removed? Second, the addition of training and ongoing quality assurance procedures to JDCs in the CM-FAM condition incurred an added financial cost that was not examined here, and such costs can be barriers to adoption. Are the training and quality assurance protocols cost effective, and how might they be configured to optimize efficiency (e.g., development of internal expert in CM-FAM)? Third, though less intensive than training and quality assurance protocols used to transport other evidence-based treatments for reducing serious antisocial behavior in adolescents, the CM-FAM training and quality assurance procedures were relatively comprehensive. What are the boundary conditions for intensity of training and quality assurance in achieving desired clinical- and system-level outcomes? Fourth, our measurement of organizational functioning is limited by the low internal consistency for the ORC-S Adaptability and Change scales and for the ORC-CJ Adaptability scale. In addition, it is entirely possible that organizational measures not examined in this study might have revealed less favorable organizational change. Perhaps, for example, the introduction of

manualized interventions changes aspects of organizational climate, such as decreased practitioner autonomy and increased stress in being required to follow protocols. Fifth, the study is limited by the involvement of a relatively small number of JDCs and by the fact that two JDCs in the US condition lost their funding during the course of the project and had to be replaced. Finally, reports of CM-FAM implementation were only collected from caregivers who attended their youth's treatment sessions (i.e., an intention-to-treat [ITT] design was not used), and this might have introduced bias in the results. Therefore, larger studies utilizing ITT measurement methods are needed to replicate and further delineate the possibly favorable effects that the introduction of evidence-based practices can have on organizations that provide substance abuse services.

4.2. Conclusion

The integration of a promising substance abuse treatment into JDCs reduced youth antisocial behavior (Henggeler et al., 2011) and, as demonstrated here, produced favorable changes in several aspects of JDC functioning. Together, and consistent with the views of reviewers (e.g., Belenko & Logan, 2003; Chassin, 2008; Henggeler, 2007; Hills et al., 2009), these results suggest that the larger scale transport of evidence-based substance-abuse treatment practices into JDCs holds the potential to significantly improve JDC outcomes, which have been modest on average in controlled evaluations, and improve the public health. Most pertinent to the present study, these findings also demonstrate therapist and stakeholder amenability to the adoption and implementation of such practices.

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Table 1

Mixed-Effect Regression Models for the CM-TAM and FAM-TAM

Outcome		β	SE	df	p	95% CI
<i>CM-TAM: Cognitive-Behavioral</i>						
Caregiver-Report ^a						
Intercept:	US	2.84	0.13	81	.000	[2.59, 3.09]
	CM-FAM vs. US	-0.22	0.16	81	.180	[-0.53, 0.10]
Slope:						
	US	-0.01	0.04	276	.693	[-0.08, 0.06]
	CM-FAM vs. US	0.11	0.04	276	.009	[0.03, 0.20]
Youth-Report ^b						
Intercept:	US	2.74	0.15	61	.000	[2.44, 3.04]
	CM-FAM vs. US	-0.36	0.20	61	.080	[-0.77, 0.04]
Slope:						
	US	-0.02	0.04	184	.611	[-0.10, 0.06]
	CM-FAM vs. US	0.12	0.05	184	.013	[0.03, 0.22]
<i>CM-TAM: Monitoring</i>						
Caregiver-Report ^a						
Intercept:	US	2.68	0.12	81	.000	[2.43, 2.92]
	CM-FAM vs. US	-0.30	0.16	81	.061	[-0.60, 0.01]
Slope:						
	US	0.01	0.04	276	.689	[-0.06, 0.09]
	CM-FAM vs. US	0.13	0.04	276	.005	[0.04, 0.21]
Youth-Report ^b						
Intercept:	US	2.51	0.16	61	.000	[2.20, 2.82]
	CM-FAM vs. US	-0.17	0.22	61	.422	[-0.60, 0.25]
Slope:						
	US	0.03	0.05	184	.462	[-0.06, 0.12]
	CM-FAM vs. US	0.10	0.05	184	.080	[-0.01, 0.20]
<i>FAM-TAM</i>						
Caregiver-Report ^a						
Intercept:	US	3.73	0.08	81	.000	[3.56, 3.89]
	CM-FAM vs. US	-0.22	0.11	81	.039	[-0.43, -0.01]
Slope:						
	US	-0.01	0.02	276	.799	[-0.05, 0.04]
	CM-FAM vs. US	0.06	0.03	276	.015	[0.01, 0.11]

Outcome		β	SE	df	p	95% CI
Youth-Report ^b						
Intercept:	US	3.55	0.12	61	.000	[3.31, 3.79]
	CM-FAM vs. US	-0.51	0.17	61	.003	[-0.84, -0.19]
Slope:	US	-0.03	0.03	184	.366	[-0.10, 0.04]
	CM-FAM vs. US	0.14	0.04	184	.001	[0.06, 0.22]

Note. CM-FAM = Contingency Management-Family Engagement Intervention; US = Usual Services; CM-TAM = Contingency Management-Therapist Adherence Measure; FAM-TAM = Family Engagement-Therapist Adherence Measure.

^a
n = 83

^b
n = 63

Table 2

Descriptive Statistics for the PSI and ORC Outcomes by Condition and Time

Outcome	Baseline		6 Month		12 Month	
	M	SD	M	SD	M	SD
<i>PSI: Tangible Incentives^a</i>						
CM-FAM	3.78	0.47	3.78	0.63	3.88	0.46
US	3.89	0.36	3.84	0.30	3.76	0.31
<i>PSI: Social Incentives^a</i>						
CM-FAM	3.87	0.39	3.90	0.42	3.89	0.45
US	3.96	0.37	3.88	0.36	3.83	0.35
<i>ORC-S: Program Needs^b</i>						
CM-FAM	32.43	6.24	30.29	7.42	26.88	8.09
US	31.44	6.69	34.20	6.86	36.25	7.27
<i>ORC-S: Adaptability^b</i>						
CM-FAM	39.00	6.01	38.81	6.40	39.75	5.25
US	39.90	4.61	37.86	4.58	40.36	6.11
<i>ORC-S: Change^b</i>						
CM-FAM	37.71	5.98	37.71	5.70	37.40	6.78
US	37.77	4.94	36.71	3.20	35.43	5.40
<i>ORC-S: Training Satisfaction^b</i>						
CM-FAM	39.26	6.64	40.24	7.82	43.00	7.33
US	37.12	9.18	33.93	7.38	27.86	12.67
<i>ORC-CI: Program Needs^c</i>						
CM-FAM	34.80	7.14	29.53	7.04	29.34	8.50
US	36.32	6.39	32.70	7.36	33.23	6.61
<i>ORC-CI: Adaptability^c</i>						
CM-FAM	39.93	3.89	38.75	4.83	40.74	3.83
US	40.10	4.65	39.86	4.33	38.63	3.58
<i>ORC-CI: Change^c</i>						
CM-FAM	38.65	5.27	37.63	3.03	39.18	3.75

Note. CM-FAM = Contingency Management-Family Engagement Intervention; US = Usual Services; PSI = Provider Survey of Incentives; ORC-S = Organizational Readiness for Change-Treatment Staff Version; ORC-CJ = Organizational Readiness for Change-Criminal Justice Version.

Outcome	Baseline		6 Month		12 Month	
	M	SD	M	SD	M	SD
US	36.53	6.87	35.28	6.41	35.48	6.49

^a
n = 125

^b
n = 51

^c
n = 74

Table 3

Mixed-Effect Regression Models for the PSI and ORC Outcomes

PSI: Tangible Incentives ^a	β	SE	df	p	95% CI
Baseline					
US	3.84	0.06	115	.000	[3.71, 3.96]
CM-FAM vs. US	-0.09	0.09	115	.299	[-0.26, 0.08]
Month 6 vs. Baseline					
US	0.02	0.07	263	.783	[-0.11, 0.15]
CM-FAM vs. US	0.03	0.09	263	.765	[-0.15, 0.21]
Month 12 vs. Baseline					
US	-0.04	0.07	263	.531	[-0.18, 0.10]
CM-FAM vs. US	0.19	0.09	263	.043	[0.01, 0.38]
PSI: Social Incentives ^a	β	SE	df	p	95% CI
Baseline					
US	3.89	0.05	115	.000	[3.79, 4.00]
CM-FAM vs. US	-0.05	0.08	115	.491	[-0.21, 0.10]
Month 6 vs. Baseline					
US	0.00	0.05	263	.953	[-0.10, 0.09]
CM-FAM vs. US	0.09	0.07	263	.178	[-0.04, 0.22]
Month 12 vs. Baseline					
US	-0.04	0.05	263	.449	[-0.14, 0.06]
CM-FAM vs. US	0.11	0.07	263	.123	[-0.03, 0.24]
ORC-S: Program Needs ^b	β	SE	df	p	95% CI
Baseline					
US	31.44	1.52	49	.000	[28.45, 34.42]
CM-FAM vs. US	1.07	2.00	49	.596	[-2.85, 4.99]
Month 6 vs. Baseline					
US	1.74	1.99	124	.385	[-2.17, 5.64]
CM-FAM vs. US	-3.57	2.47	124	.151	[-8.41, 1.28]

PSI: Tangible Incentives^a	β	SE	df	p	95% CI
Month 12 vs. Baseline					
US	3.99	2.06	124	.055	[-0.05, 8.03]
CM-FAM vs. US	-9.34	2.55	124	.001	[-14.34, -4.35]
ORC-S: Adaptability^b	β	SE	df	p	95% CI
Baseline					
US	39.17	1.23	49	.000	[36.75, 41.58]
CM-FAM vs. US	-0.10	1.64	49	.954	[-3.31, 3.12]
Month 6 vs. Baseline					
US	-0.50	1.27	124	.690	[-2.99, 1.98]
CM-FAM vs. US	-0.28	1.54	124	.854	[-3.30, 2.73]
Month 12 vs. Baseline					
US	0.78	1.34	124	.562	[-1.85, 3.41]
CM-FAM vs. US	-0.67	1.61	124	.675	[-3.83, 2.48]
ORC-S: Change^b	β	SE	df	p	95% CI
Baseline					
US	37.41	1.22	49	.000	[35.02, 39.80]
CM-FAM vs. US	0.19	1.60	49	.906	[-2.95, 3.34]
Month 6 vs. Baseline					
US	-0.68	1.49	124	.650	[-3.60, 2.25]
CM-FAM vs. US	0.37	1.84	124	.839	[-3.23, 3.98]
Month 12 vs. Baseline					
US	-1.71	1.56	124	.274	[-4.76, 1.34]
CM-FAM vs. US	1.17	1.90	124	.539	[-2.56, 4.91]
ORC-S: Training Satisfaction^b	β	SE	df	p	95% CI
Baseline					
US	37.42	1.73	48	.000	[34.03, 40.81]
CM-FAM vs. US	1.81	2.29	48	.433	[-2.67, 6.29]
Month 6 vs. Baseline					

PSI: Tangible Incentives ^d		β	SE	df	p	95% CI
US		-3.04	2.72	123	.266	[-8.36, 2.28]
CM-FAM vs. US		4.07	3.49	123	.246	[-2.77, 10.90]
Month 12 vs. Baseline						
US		-9.42	2.74	123	.001	[-14.80, -4.04]
CM-FAM vs. US		13.22	3.53	123	.001	[6.29, 20.14]
ORC-CI: Program Needs ^e		β	SE	df	p	95% CI
Baseline						
US		35.45	1.08	72	.000	[33.33, 37.57]
CM-FAM vs. US		-0.21	1.81	72	.907	[-3.75, 3.33]
Month 6 vs. Baseline						
US		-2.68	1.14	181	.020	[-4.92, -0.43]
CM-FAM vs. US		-2.29	1.83	181	.212	[-5.89, 1.30]
Month 12 vs. Baseline						
US		-2.54	1.29	181	.050	[-5.08, -0.01]
CM-FAM vs. US		-2.46	1.90	181	.198	[-6.18, 1.27]
ORC-CI: Adaptability ^e		β	SE	df	p	95% CI
Baseline						
US		40.18	0.65	72	.000	[38.91, 41.45]
CM-FAM vs. US		-0.11	1.07	72	.915	[-2.21, 1.98]
Month 6 vs. Baseline						
US		-0.39	0.72	181	.589	[-1.79, 1.02]
CM-FAM vs. US		-0.13	1.15	181	.914	[-2.38, 2.13]
Month 12 vs. Baseline						
US		-1.31	0.80	181	.105	[-2.88, 0.27]
CM-FAM vs. US		2.53	1.19	181	.035	[0.19, 4.87]
ORC-CI: Change ^e		β	SE	df	p	95% CI
Baseline						
US		37.24	0.93	72	.000	[35.42, 39.06]

PSI: Tangible Incentives ^a	β	SE	df	p	95% CI
CM-FAM vs. US	1.16	1.59	72	.470	[-1.96, 4.27]
Month 6 vs. Baseline					
US	-2.23	0.88	181	.013	[-3.97, -0.50]
CM-FAM vs. US	1.61	1.40	181	.253	[-1.14, 4.36]
Month 12 vs. Baseline					
US	-2.23	1.01	181	.028	[-4.21, -0.25]
CM-FAM vs. US	2.70	1.46	181	.066	[-0.17, 5.57]

Note. CM-FAM = Contingency Management-Family Engagement Intervention; US = Usual Services; PSI = Provider Survey of Incentives; ORC-S = Organizational Readiness for Change-Treatment Staff Version; ORC-CJ = Organizational Readiness for Change-Criminal Justice Version.

^a $n = 125$

^b $n = 51$

^c $n = 74$