EFFICACY OF THE 20-WEEK CIRCLE OF SECURITY INTERVENTION: CHANGES IN CAREGIVER REFLECTIVE FUNCTIONING, REPRESENTATIONS, AND CHILD ATTACHMENT IN AN AUSTRALIAN CLINICAL SAMPLE

ANNA HUBER, CATHERINE A. MCMAHON, AND NAOMI SWELLER
Macquarie University

ABSTRACT: Circle of Security is an attachment theory based intervention that aims to promote secure parent–child attachment relationships. Despite extensive uptake of the approach, there is limited empirical evidence regarding efficacy. The current study examined whether participation in the 20-week Circle of Security intervention resulted in positive caregiver–child relationship change in four domains: caregiver reflective functioning; caregiver representations of the child and the relationship with the child; child attachment security, and attachment disorganization. Archived pre- and postintervention data were analyzed from 83 clinically referred caregiver–child dyads (child age: 13–88 months) who completed the Circle of Security intervention in sequential cohorts and gave permission for their data to be included in the study. Caregivers completed the Circle of Security Interview, and dyads were filmed in the Strange Situation Procedure before and after the intervention. Results supported all four hypotheses: Caregiver reflective functioning, caregiving representations, and level of child attachment security increased after the intervention, and level of attachment disorganization decreased for those with high baseline levels. Those whose scores were least optimal prior to intervention showed the greatest change in all domains. This study adds to the evidence suggesting that the 20-week Circle of Security intervention results in significant relationship improvements for caregivers and their children.

Keywords: Circle of Security, attachment, reflective functioning, parent representations

RESUMEN: El Círculo de Seguridad es una intervención basada en la teoría de la afectividad cuya meta es promover relaciones seguras de afectividad entre progenitor y niño. A pesar de la amplia captación del acercamiento, hay una limitada evidencia empírica con respecto a la efectividad. El presente estudio examinó si la participación en la intervención de 20 semanas del Círculo de Seguridad resultó en positivos cambios en la relación entre quine cuida y el niño, en cuatro áreas: el funcionamiento reflexivo de quien presta cuidado; las representaciones que quien cuida tienen del niño y la relación con el niño; la seguridad de afectividad del niño y la desorganización de la afectividad. Se analizó información archivada de antes y después de la intervención, a partir de 83 díadas de cuidadores y niños, referidas clínicamente (edad del niño – 13 a 88 meses), quienes completaron la Intervención del Círculo de Seguridad en grupos secuenciales y dieron su permiso para que su información fuera incluida en el estudio. Quienes prestaban cuidado completaron la Entrevista del Círculo de Seguridad, y las díadas fueron grabadas en video en el Procedimiento de la Situación Extraña antes y después de la intervención. Los resultados apoyan todas las cuatro hipótesis: el funcionamiento reflexivo de quien presta cuidado, las representaciones de prestar el cuidado, y el nivel de seguridad de la afectividad del niño aumentaron después de la intervención, y el nivel de desorganización de la afectividad bajó para aquellos que tenían una línea base alta. Aquellos cuyos puntajes fueron los menos óptimos antes de la intervención mostraron el mayor cambio en todos los dominios. Este estudio contribuye a la evidencia que sugiere que la intervención de 20 semanas del Círculo de Seguridad resulta en significativas mejoras en la relación para quienes prestan cuidado y sus niños.

Palabras claves: Círculo de Seguridad, afectividad, funcionamiento reflexivo, representaciones del progenitor

RÉSUMÉ: Le Cercle de Sécurité est une intervention basée sur la théorie de l'attachement qui a pour but de promouvoir les relations d'attachement parent-enfant sécures. En dépit de l'assimilation de l'approche, il n'existe que des preuves empiriques pour ce qui concerne son efficacité. Cette étude a examiné si la participation à une intervention Cercle de Sécurité de 20 semaines a résulté en un changement positif de la relation donneur de soin- enfant dans quatre domaines: le fonctionnement de réflexion de la personne prenant soin de l'enfant; les représentations de l'enfant que se fait cette personne; la sécurité de l'attachement et de l'enfant et la désorganisation de l'attachement. Des données archivées d'avant et d'après intervention de 83 dyades donneur de soin-enfant placé en consultation (âge de l'enfant-13-88 mois), ayant complété l'Intervention Cercle de Sécurité en cohortes séquentielles et ayant donné la permission pour que leurs données soient inclues dans l'étude. Les donneurs de soin ont passé l'Entretien Cercle de Sécurité, et les dyades ont été filmées durant une Procédure de Situation Etrange avant et après l'intervention. Les résultats soutiennent toutes les quatre hypothèses: le fonctionnement de réflexion du donneur de soin, les représentations du donneur de soin, et le niveau de la sécurité d'attachement de l'enfant ont tous augmenté après l'intervention. Le niveau de désorganisation de l'attachement, quant à lui, a diminué pour ceux ayant des niveaux de base élevés. Ceux dont les scores étaient loin d'être optimaux avant l'intervention ont démontré le plus grand changement dans tous les domaines. Cette étude ajoute aux preuves suggérant que l'intervention Cercle de Sécurité de 20 semaines résulte en d'importantes améliorations de la relation pour les donneurs de soin et leurs enfants.

Mots clés: Cerce de Sécurité, attachement, fonctionnement réfléchi, représentations parentales

ZUSAMMENFASSUNG: Der „Kreis der Sicherheit" ist eine Intervention, die auf der Bindungstheorie basiert, und eine sichere Eltern-Kind-Bindung fördern soll. Trotz des umfangreichen Aufgreifens des Ansatzes gibt es nur begrenzte empirische Evidenz zur Wirksamkeit. Die aktuelle Studie untersuchte, ob die Teilnahme an der 20-wöchigen „Kreis der Sicherheit"-Intervention in vier Bereichen zu positiven Änderungen in der Bezugsperson-Kind-Beziehung führt: in der Mentalisierungsfähigkeit der Bezugsperson; in den Repräsentationen der Bezugsperson bezüglich des Kindes und der Beziehung zu dem Kind, sowie in der Bindungssicherheit und Bindungsdesorganisation des Kindes. Archivierte Daten von 83 klinischen Bezugsperson-Kind-Dyaden (Alter des Kindes: 13–88 Monate) vor und nach der Intervention wurden analysiert. Die Dyaden nahmen in sequentiellen Kohorten an der „Kreis der Sicherheit"-Intervention teil und gaben die Erlaubnis für die Verwendung ihrer Daten im Rahmen der Studie. Die Bezugspersonen nahmen am „Kreis der Sicherheit"-Interview teil und die Dyaden wurden im Fremde-Situations-Test vor und nach der Intervention gefilmt. Die Ergebnisse unterstützen alle vier Hypothesen: Die Mentalisierungsfähigkeit der Bezugsperson, die fürsorglichen Repräsentationen, und das Niveau der Bindungssicherheit des Kindes war nach der Intervention erhöht, während sich das Niveau der Bindungsdesorganisation für die Teilnehmer mit hohen Ausgangswerten verringerte. Diejenigen, deren Werte vor der Intervention am wenigsten dem Optimalmaß entsprachen, zeigten die größte Veränderung in allen Bereichen. Diese Studie liefert einen weiteren Beweis, dass die 20-wöchige „Kreis der Sicherheit"-Intervention zu signifikanten Verbesserungen in der Beziehung von Bezugspersonen und ihren Kindern führt.

Keywords: Kreis der Sicherheit, Bindung, Mentalisierungsfähigkeit, elterliche Repräsentationen

抄録: 安心感の輪Circle of Securityは、愛着理論に基づく介入で、安定した親 – 子の愛着関係を促進することを目的としている。このアプローチが大きく広がっているにもかかわらず、有効性についての経験的な根拠は限られている。この研究では、20週間の安心感の輪介入への参加が、4つの領域でポジティブな養育者 – 子ども関係性の変化をもたらしているかどうかを検証した。それらの領域とは、養育者のリフレクティブな機能、子どもおよび子どもとの関係性についての養育者の表象、子どもの愛着の安定性、および愛着の解体である。 83組の臨床から紹介された養育者と保護者(子どもの月齢13~88ヶ月)の保管されていた介入前後のデータが分析された。彼らは連続したコホートの中で安心感の輪介入を完了し、彼らのデータを研究に使うことを許諾した。養育者は安心感の輪面接を受け、養育者と子どもは介入の前後のStrange Situation Procedureをフィルムに撮られた。結果は4つの仮説すべてを支持した。養育者のリフレクティブな機能、養育の表象そして子どもの愛着の安定性水準は、介入後に増加した。そして愛着の解体水準のベースラインが高かった子どもでは、解体水準が低下した。介入前のスコアがもっとも悪かった養育者と子どもが、すべての領域でもっと大きな変化を示した。 この研究から、20週の安心感の輪介入により、養育者とその子どもの関係性に有意の改善をもたらされることの示唆が、根拠に追加される。

キーワード: 安心感の輪, 愛着, リフレクティブな機能, 親の表象

摘要: 安全圈(Circle of Security)是一個基於依附理論干預, 旨在促進安全的親子依附關係。儘管該方法被廣泛應用, 有關其功能的經驗證據只是有限。本研究調查20週的安全圈干預是否對看護者和兒童的關係, 在四個範圍中起正面作用: 看護者的反思功能; 看護者對兒童的陳述及和兒童的關係; 兒童依附安全感和依附混亂。 數據檔案由83名臨床轉診看護者 – 兒童二人組合提供(孩子年齡13-88個月), 他們以族群系列法完成安全圈干預, 並允許將他們的數據納入研究分析。看護者完成安全圈訪談, 二人組合在干預前後的陌生情境程序(Strange Situation Procedure)過程被拍攝。 結果支持所有四個假設: 看護者反思運作, 看護陳述, 孩子依附安全感在干預後提高, 高基線水平孩子的依附混亂在干預後減少。在干預前得分最少的組合在所有範圍中起最大變化。 這項研究增加有關證據, 表明20週的安全圈干預顯著改善看護者和他們孩子的關係。

關鍵詞: 安全圈, 依附關係, 反思功能, 家長陳述

ملخص: دائرة الأمان عبارة عن إجراء يعتمد على نظرية التعلق ويهدف إلى التشجيع على علاقات آمنة بين الطفل والوالدين . على الرغم من تبني هذا الاتجاه على نطاق واسع فليس هناك دلائل تجريبية كافية على فاعلية هذا الاجراء. قامت هذه الدراسة ببحث ما إذا كانت المشاركة فى برنامج الـ 20 أسبوع لدائرة الأمان قد تؤدى إلى تغير فى علاقة الطفل ومقدم الرعاية من أربع جوانب : الأداء التأملى المنعكس لمقدم الرعاية – تمثيلات مقدم الرعاية تجاه الطفل والعلاقة معه – أمان التعلق عند الطفل – واختلال التعلق . اشتملت عينة الدراسة على 83 ثنائى (أعمار الأطفال بين 13-88 شهر) والذين استكملوا تطبيق دائرة الأمان والمقابلة الشخصية وتم تسجيل الثنائيات بالفيديو فى تجربة الموقف الغريب قبل وبعد التطبيق التجريبى لدائرة الأمان . وقد دعمت النتائج الفرضيات الأربعة : حيث زادت نسبة الأداء المنعكس وتمثيلات مقدم الرعاية ومستوى أمان التعلق لدى الطفل بينما قلت نسبة اختلال التعلق وخصوصا عند ذوى المستويات العالية فى الأداء . أما الذين حققوا درجات أقل قبل التجربة فقد أظهروا أعلى نسبة تغيير فى جميع الجوانب . هذه الدراسة تضيف دلائل على أن تطبيق دائرة الأمان (20 أسبوع) يؤدى إلى تحسن ملحوظ فى العلاقة بين مقدم الرعاية والأطفال .

كلمات مفتاحية : دائرة الأمان – التعلق – الأداء المنعكس – تمثيلات الآباء

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A large body of research has consistently confirmed that the quality of a child's attachment relationship with his or her primary caregiver is a key determinant of socioemotional development (Ainsworth, 1979; Bowlby, 1969/1997, 1988/2005; Cassidy & Shaver, 2008; Sroufe, Egeland, Carlson, & Collins, 2005). Consequently, attachment-based interventions seek to achieve more positive outcomes for children by promoting positive parent–child relationships. The current study reports an evaluation of one such intervention, the Circle of Security (COS; Powell, Cooper, Hoffman, & Marvin, 2014), which explicitly focuses on caregiving patterns associated with individual differences in attachment and on the caregiving representations believed to underlie these different patterns of caregiving.

Three patterns of organized attachment have been identified (Ainsworth, Blehar, Waters, & Wall, 1978). Secure attachment reflects a relationship in which the caregiver provides protection and support, "a haven of safety," for the infant's emotion regulation when threatened or distressed (Bowlby, 1969/1997, p. 303) as well as support for the child's exploration and learning, "a secure base" (Bowlby, 1988/2005, p. 12). Two insecure patterns have been described and conceptualized as adaptations by the child to unpredictable and/or conditional responsiveness of the caregiver. Avoidant attachment is associated with caregiving responses that do not meet fully the child's safe haven needs, with an overemphasis on encouraging exploration, while ambivalent attachment is associated with unpredictable caregiver availability and/or inadequate support for secure base needs and reluctance to support autonomous exploration by the child (Ainsworth et al., 1978). In addition to these three organized patterns, a disorganized pattern was identified (Main & Solomon, 1986), in which the caregiver is thought to be experienced as *frightening* or *frightened by* the child (Main & Hesse, 1990) and/or unable to adequately modulate child arousal when the child needed protection or emotional support (Lyons-Ruth, Bronfman, & Parsons, 1999). This latter classification has been most consistently associated with adverse child emotional and behavioral outcomes (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Solomon & George, 2011a).

Repeated experiences with a caregiver are believed to be mentally represented as internal working models that are carried forward into new relationships (Bowlby, 1969/1997, 1973/1998; Solomon & George, 1996). Internal working models also are important determinants of caregiving quality. Caregivers' internal working models, or "representations," of attachment and caregiving (derived from their own early experiences with parents) have been shown to be powerful predictors of the quality of the attachment–caregiving relationships that they develop with their own children (Benoit, Parker, & Zeanah, 1997; George & Solomon, 1996, 2008; van IJzendoorn, 1995; Vreeswijk, Maas, & van Bakel, 2012).

Central to the theory, and a core assumption underlying attachment-based interventions, is the view that internal working models are dynamic and can be influenced and revised in response to later relationship or therapeutic experiences, especially if brought to conscious awareness (Bretherton & Munholland, 2008; Bowlby, 1969/1997). In this regard, metacognitive processes (Main, 1991), particularly awareness of mental states in the self and others (Fonagy, Gergely, & Target, 2008; Fonagy & Target, 2005), have become an important therapeutic focus. This capacity to reflect on mental states and their connection with behavior is theorized to be a crucial prerequisite for change in caregiving representations and ultimately in caregiving behavior (Grienenberger, Kelly, & Slade, 2005; Slade, 2005a; Steele & Steele, 2008).

The COS intervention distills the essence of attachment theory and research into an understandable/accessible relational model that parents and therapists can use together to address difficulties in attachment–caregiving relationships, including child behavior problems (Powell et al., 2014). Simply stated, the intervention aims to enhance child attachment security by targeting parent behavior, representations, and reflective functioning (RF; Berlin, Zeanah, & Lieberman, 2008). The provision of a therapeutic safe haven and secure base for the caregiver is central to the approach.

The intervention seeks to achieve these objectives by (a) developing the caregivers' capacity to accurately observe themselves interacting with their child and describe how they behave in response to the child's signaling of attachment, exploration, and
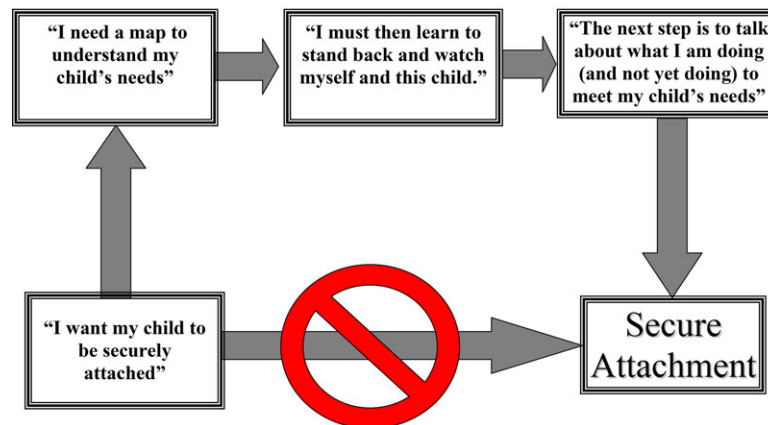
The Path to Secure Attachment

FIGURE 1. The path to secure attachment. Reproduced with permission from G. Cooper, K. Hoffman, R. Marvin, & B. Powell (2000), Circle of Security Facilitator's Manual (p. 98). Unpublished manuscript.

caregiving needs; (b) helping parents to become aware of their own mental representations of caregiving and attachment, and how these influence their own and their child's behavior in the relationship; and changing maladaptive mental representations of caregiving to more accurate and adaptive ones by (c) developing the caregiver's capacity for RF. Figure 1 summarizes the proposed therapeutic pathway.

While the COS intervention is strongly theoretically grounded and shows promise for improving caregiver–child attachment in high-risk families (Cassidy, Woodhouse, Sherman, Stupica, & Lejuez, 2011; Cassidy et al., 2010; Hoffman, Marvin, Cooper, & Powell, 2006), empirical support for the effectiveness of the approach is limited. Only one previous study (Hoffman et al., 2006) has demonstrated the effectiveness of the 20-week COS intervention, with results indicating that in a sample of preschool and toddler children from high-risk families, the proportion of children classified as securely attached and with organized attachment increased significantly after the intervention. Further research is needed to replicate and extend these findings. It remains unclear whether the approach also would be effective for older children and in samples outside of North America. Alternate approaches to assessing attachment also should be considered, which may enable detection of more subtle treatment effects.

A number of attachment researchers have argued for the use of dimensional as well as categorical indicators of attachment quality (e.g., Cummings, 2003; Fraley & Roisman, 2014; Fraley & Spieker, 2003a, 2003b; Hesse, 2008; Waters & Beauchaine, 2003). Use of continuous ratings can allow for detection of more subtle variations between individuals on more than one scale, increase statistical power, and reduce potential errors in measurement associated with categorical decision-making. In addition, security and disorganization can be successfully measured as continua, giving a clearer picture of the relative security and disorganization of each dyad as well as different patterns within each categorical group of attach-

ment (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005). These continuous measures also can be used to identify associations between security and disorganization and other variables. No study to date has evaluated the COS intervention in this way.

Importantly, as caregiver RF and representations are the central therapeutic focus of the COS approach, empirical studies also need to examine whether the intervention changes the way caregivers think about themselves and their child. The current study set out to address some of these gaps and to explore the effectiveness of the 20-week intervention across a broad age range of clinically referred children and their caregivers. We considered the following questions:

RQ1: Does the COS intervention improve (a) caregiver RF, (b) caregiver representations of self and child, and (c) child–caregiver attachment?

RQ2: Does the effectiveness of the intervention differ depending on (a) caregiver characteristics (RF, caregiving representations) and (b) child characteristics (age, attachment security, or disorganization) prior to treatment?

We hypothesized that compared to scores prior to treatment, after treatment:

H1: Caregiver RF scores would increase.
H2: Caregiving representations would be more positive.
H3: Attachment security would increase.
H4: Attachment disorganization would decrease.

We also sought to investigate if there were differences in intervention effects depending on indices of relationship functioning prior to treatment. The treatment manual suggests that at least a modest level of RF is a prerequisite for parents to engage effectively in the reflective dialogue integral to the approach (Cooper, Hoffman, Marvin, & Powell, 2000). This suggests that those with more reflective capacity may respond better to the treatment,

consistent with other attachment-based programs that have found more benefit for those starting with more secure states of mind (Bick, Dozier, & Moore, 2012). On the other hand, previous research using COS has found that families with high rates of insecurity or adversity also have benefited (Cassidy et al., 2010; Hoffman et al., 2006), possibly because there was more room to show improvement. Therefore, it is difficult to propose a directional hypothesis regarding differential effects. We therefore decided to undertake exploratory analyses to find out whether more impaired or less impaired families benefited more from the intervention. Accordingly, baseline levels of caregiver RF, representations, child attachment security, and disorganization were examined as moderators to test if the intervention worked differently for those commencing with higher or lower levels of these relationship indices.

METHOD

Participants

Study participants were 83 of 95 parent–child dyads referred to a metropolitan community-based infant and early childhood mental health service because of concerns about child behavioral or emotional difficulties and/or the parent–child relationship. All referred families were offered the COS intensive treatment if willing and able to commit to a 20-week group program. Those who completed the intervention were included in the study (see Figure 2).

Subjects were 48 boys (58%) and 35 girls (42%) aged 13 to 88 months ($M = 47.80$, $SD = 17.48$) at preassessment. A majority ($n = 52$; 63%) were 48 months or younger at commencement. Caregivers included 73 biological parents (88%), 5 foster/adoptive parents (6%), and 5 kinship carers (6%). Most caregivers ($n = 75$, 90%) were female, and most had postsecondary-school education ($n = 50$, 60%). Thirty-two (39%) were single parents; three families (4%) identified as Aboriginal or Torres Strait Islander (ATSI), and 20 (24%) identified as coming from other culturally or linguistically diverse backgrounds. Family psychosocial risk factors since the child was born included histories of family violence ($n = 27$, 33%), parental divorce or separation ($n = 35$, 42%), caregiver reporting of prior or current mental health problems ($n = 74$, 89%), and substance abuse by a family member ($n = 21$, 25%). Sixteen (19%) of the children had experienced substantiated abuse or neglect, according to intake records.

Procedure

The study was conducted in a clinical setting. Ethics approval was a staged process. In Stage 1, the clinical organization sought consent from clients after treatment completion for their clinical data to be included in any future research evaluating the intervention. Subsequently, consent was obtained from the clinical service to use this archived data from consenting caregivers in a research project to evaluate the COS intervention; the project also was approved by relevant institutional ethics committees. A pre/post sequential cohort design was used to examine change after the COS intervention, using caregiver RF, caregiving representations, and indices of child attachment security and disorganization as the primary outcome measures.

Preassessment. Participant dyads attended the clinic (no more than 6 weeks before the intervention commenced) for an initial assessment session lasting approximately 90 min. This included a videotaped, 30- to 45-min parent–child semistructured interaction to activate the attachment system followed by a book-reading interaction and pack-up task with the caregiver. All caregivers then participated in a videotaped, semistructured, narrative COS Interview (COSI; Cooper, Hoffman, Marvin, & Powell, 1999). Demographic and psychosocial risk information was obtained from questionnaires completed by caregivers as well as from intake information at the clinic.

COS Intervention Protocol. The COS assessment and treatment protocol, described in detail in the facilitator's manual (Cooper et al., 2000; Powell et al., 2014), focuses on improving caregiver relational capacities associated with child attachment security. For each dyad, a core parental difficulty in meeting the child's attachment and exploration needs, termed the *linchpin struggle* (Powell et al., 2014, p. 83), is identified, and video clips are chosen from the initial assessment to assist the parent to see both their capacities and difficulties in relation to this issue.

The treatment sessions were comprised of 20 weekly 90-min group sessions with two COS trained therapists. Therapists were psychologists or social workers. All had completed a 10-day training program delivered in Australia by one of the COS originators (Cooper, Hoffman, or Powell) and passed an exam certifying capability to conduct the assessment and treatment planning. They subsequently gained certification as COS providers by delivering two 20-week COS group programs under the supervision of one of the program originators or another COS-accredited supervisor.

The program included three sessions of psychoeducation about attachment theory and psychological defenses (referred to as "shark music") and 15 individualized psychotherapeutic/tape review sessions (three in total for each caregiver) using selected clips from the initial and a later interaction assessment. An interaction taping session at Week 16 captured changes taking place in the relationship, providing material for the third tape review. The intervention concluded with a final session reflecting on and celebrating change in each relationship.

Eighteen groups, each with 4 to 6 caregivers, completed the 20-week intervention over a 6-year period. Of 90 who commenced, 83 (92%) caregivers were deemed to have completed the intervention, having attended (a) the three theory sessions and (b) all three of their individual tape reviews, and (c) missed no more than four sessions in total; that is, completed a minimum of 16 of 20 sessions (80%). Those who met these completion criteria did not differ on demographic or psychosocial indicators from those who did not. Caregivers were assigned to treatment groups (all using the COS protocol) according to child age: "Circle of Security" (COS) groups for younger children and "Secure Relationships"
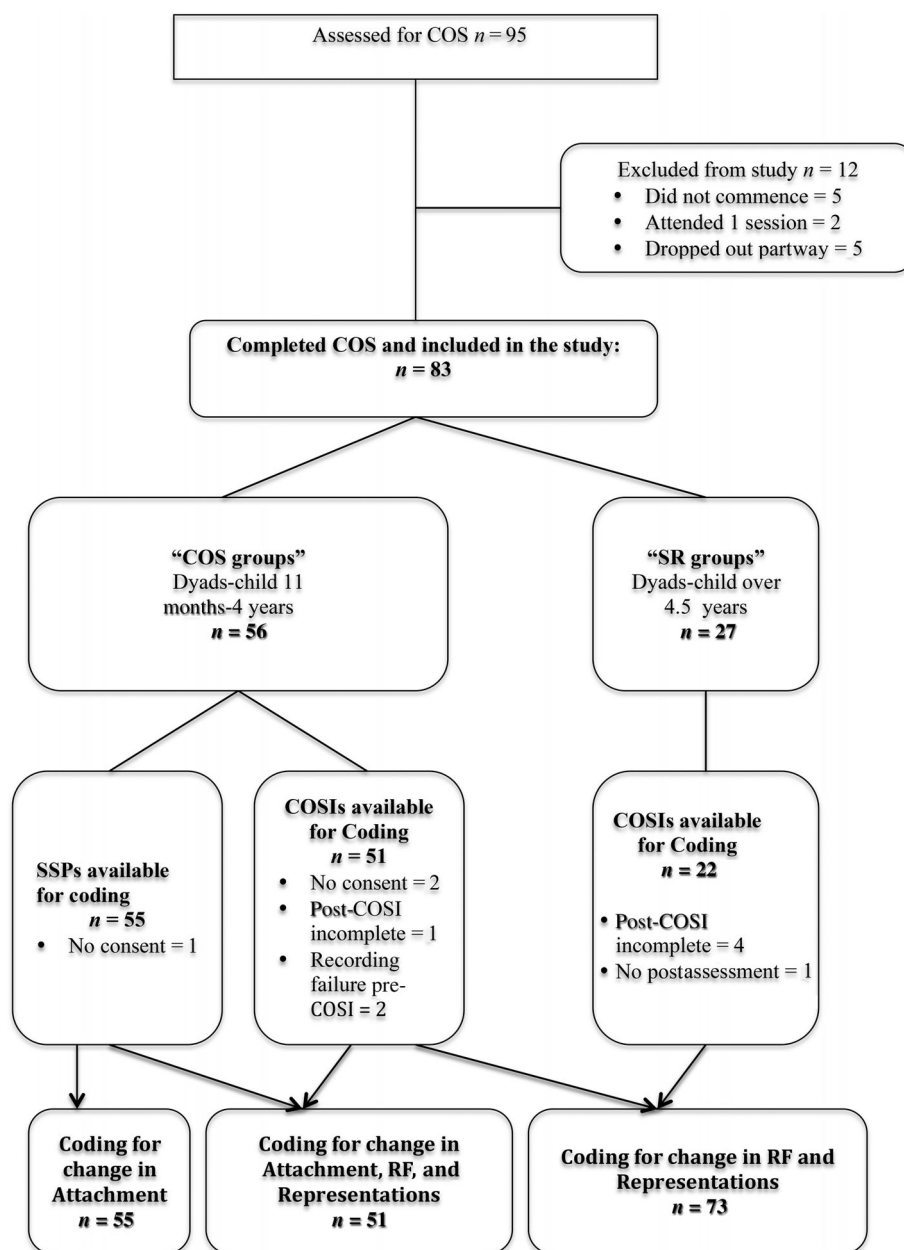
FIGURE 2.   Flowchart showing participant numbers.

(SR) groups for older children (see Figure 2). Children did not participate in sessions, and childcare was provided if needed in an adjacent location.

Treatment fidelity was ensured by the use of the manualized COS protocol (Cooper et al., 2000), and both therapists participated in weekly supervision with one of the COS program originators (Glen Cooper) or a trained clinician accredited as a COS supervisor (first author). Sessions were videotaped and reviewed in supervision.

Postassessment. The postintervention assessments (repeat video-taped interaction and COSI interviews) were conducted within 6 weeks of the final group session. While precise data are not available regarding the exact timing of the postassessment, all were conducted within 2 weeks, with the exception of those few families for whom illness or emergency meant that a somewhat later assessment was required.

Measures

Interview: the COSI. The COSI is fully described in Powell et al. (2014). The earlier version used in this study (Cooper et al., 1999) includes three parts: (a) six questions about the caregivers' perception of their own and their child's experience in the

interaction assessment; (b) 13 questions about the caregivers' perception of self as parent and of their relationship with the target child adapted from the Parent Development Interview-Revised (Slade, Aber, Bresgi, Berger, & Kaplan, 2004); (c) nine questions adapted from the Adult Attachment Interview (George, Kaplan, & Main, 1984–1996), describing the relationship with the caregivers' own attachment figure(s) and how this may affect how their care for the target child. The final question asks about what the caregiver hopes the child learns from his or her experiences of being parented.

The videotaped interviews were de-identified, converted to audiotape, and then transcribed verbatim by experienced transcribers. Transcripts were corrected and assigned a dummy code to obscure the pre/post status of the assessment. While any explicit references to program participation were redacted from interview transcripts, coders might have inferred pre/post condition from patterns of difference in emotional tone, emphasis, and phrases that parents used as they spoke about their relationship with their children before and after intervention. In all, 146 interview transcripts for 73 dyads (across the age range) were available for coding (see Figure 2). The COSI interviews were independently coded in two different ways by different coders: for caregiver RF (CRF) and for caregivers' representations of their child and themselves in the caregiving role.

CRF. CRF was coded using the RF coding scale, originally developed by Fonagy, Steele, Steele, and Target (1998) for use with the Adult Attachment Interview (George et al., 1984) and subsequently adapted for the Parent Development Interview-Revised (Slade, et al., 2004; Slade, Bernbach, Grienenberger, Levy, & Locker, 2005). CRF scores (range = −1–+9) were assigned by three independent coders from the Anna Freud Center, London, certified as reliable in coding RF on both Adult Attachment Interview and Parent Development Interview-Revised transcripts. Scores were assigned to 16 demand questions that contain probes which explicitly ask parents to state what they think the child may be thinking and feeling and also what they may have been thinking and feeling themselves. An overall score is assigned based on these responses and the interview as a whole. Coders were blind to the intervention and to whether interviews were from pre-/postassessments, but were given the child's age in months and gender. Transcripts were assigned so that each coder scored a mix of pre/post interviews with caregivers of different-aged children, but not both pre/post interviews for the same dyad. Twenty-five interviews (17% of total) were independently coded by the three coders, in two sets, and disagreements were resolved through conferencing. Interrater reliability was high for both the first set of 12 interviews [intraclass correlation coefficient (ICC), single = .83] and the second set of 13 interviews (ICC, single = .88). Overall CRF scores were used for analyses. Participants also were classified dichotomously at Time 1 according to whether they had definite RF, a score of ≥;5, or a score < 5 (Fonagy et al., 1998, Slade et al., 2005).

Parental caregiving representations. Using the same interview transcript, a coding scale was developed for the current study to measure caregiving representations. The approach and scales were based in part on other approaches using multiple caregiver dimensions such as the Emotional Availability Scales (4th ed., Biringin, 2008), the Parent Development Interview-R (Slade et al., 2004), and the Caregiving Interview (George & Solomon, 1989). Eight scales yield scores for two affect dimensions (Hostility, Joy) coded from statements indicating feelings about the child and/or the relationship, and six dimensions reflecting caregivers' perceptions of self as a caregiver to their child that are closely aligned with the core principles and language used in the COS intervention (Bigger/Stronger, Kind, Mean, Weak, Gone, Role Reversed). While some dimensions are informally termed, reflecting their use within the intervention (Powell et al., 2014), they capture widely researched aspects of parent affect and cognitions associated with child behavioral and emotional functioning and caregiving adequacy (for details, contact the first author for the coding manual; see Table 1).

A trained coder assigned a continuous score (range = 1–5) based on reading the complete transcript for each dimension, with anchor points as follows: 1 (*no statements/indicators*, 3 (*a few indicators or partial indicators*; e.g., if statements indicative of the dimension are present, but idealized, qualified, poorly supported, or partly contradicted), and 5 (*definite and/or frequent indicators*; i.e., the construct is clearly and consistently apparent throughout the interview). Scores of 2 or 4 can be allocated, as appropriate. Coders were blind to pre/post condition and all information about the dyad, except for child gender and age in months. Interviews were assigned to coders in random order with pre/post interviews mixed. A reliability subset of 30 interviews (20%) was independently coded by a second coder (first author). Scores from the primary coder were used, and substantial differences were resolved through conferencing. Correlations between the two coders on each dimension ranged from .92 (Hostility) to .72 (Gone).

Two additional indicators were coded based on the caregivers' responses when explicitly asked if there are times that the child is afraid of them (e.g., "He gets scared when I yell.") or that they are frightened of the child (e.g., "I'm frightened of him, of his anger, you know."). These were coded as present/absent, as such statements were relatively infrequent but considered important clinical indicators of risk of disorganized caregiving (Hesse & Main, 2000; Solomon & George, 2011a). A chi-square analysis indicated a high level of agreement between coders: $\chi^2 = 25.45$ (1), $p = .000$ for *frightened of* and $\chi^2 = 22.50$ (1), $p = .000$ for *frightening to* the child.

A composite score was derived for overall caregiving representations (mean of eight dimensions, negative dimensions reverse-coded, frightened/frightening categories not included). Higher scores on this composite score, hereafter referred to as *Positive Representations*, indicated more positive (optimal) representations. Subsequently, a dichotomous variable delineating caregivers with Positive Representations scores <3 (positive indicators

TABLE 1. *Coding Dimensions for Caregiving Representations*

Dimension	Description	Example Caregiver Statement
Hostility	Presence of words or phrases that indicate hostility/lack of respect/criticism of child	"Sometimes I wish I never had this child, she can be such an embarrassment."
Joy	Joy/pleasure in descriptions of relationship with child	"I think it's the interactions we have. At—at the moment, she's, um, trying to develop her sense of humour, and telling jokes . . . that just, um, makes me feel happy. Yeah, I enjoy that.
Bigger/Stronger	Statements that clearly suggest parent feels in charge, able to take control, and manage the child when needed	It takes a lot of effort to deal with that, but I still feel in control and that I'm her mother and I can help her through it."
Kind	Parent reports behaving in a kind way toward child, showing concern for and/or offering support to the child.	"Last night he had a nightmare and he come out to the lounge room, and I just cuddled him, and reassured him."
Mean	Parent describes relating to the child using power over the child in a punitive, cruel, harsh, or frightening way.	"Mother of 3-year-old: She just started up again, screaming and being ridiculous. Um, [pause] so I think yesterday I ended up smacking her across her leg because I was just so frustrated."
Weak	Parent describes self as incapable, powerless, helpless, and lacking in confidence in her/his ability to parent this child (especially when parent needs to take charge).	"She just—just seems to get irrationally angry and uncooperative and it's not something that I feel like I have any control over . . . —I don't know how to stop it."
Gone	Parent reports being physically and psychologically unavailable and/or unresponsive when needed by this child.	"I do emotionally shutdown, um, I detach and I guess it's a self defence thing or a, um, [pause] don't know what to do so let's shut it down. . . ."
Role Reversed	Statements showing lack of appropriate hierarchy in caregiving relationship, including seeing child as in control, or seeing self & child as peers	Self and child as peers, e.g., Mother of 5-year-old: "We can still be really good, like, helping each other." Role reversal, e.g., Mother of 4-year-old: "He says "it's okay mummy, it'll alright." He, sort of, I guess steps up and be..s the man,"

not present) from those with scores ≥3 (at least a few positive indicators present) was created to allow for pre- and postintervention comparisons of outcomes depending on initial presentation.

Parent–child attachment (Strange Situation). Parent–child attachment for 55 dyads (children ≤4 years at baseline) was coded from pre- and postintervention videotapes of the Strange Situation Procedure (SSP; Ainsworth et al., 1978). Children older than 48 months ($n = 27$) participated in an attachment-activating interaction session including a stranger, separation and reunion from the caregiver, and an attachment activating a story stem prompt (e.g., child loses parent in shopping center) provided by the stranger for the child to complete. Attachment coding is not available for these children.

The SSP has been extensively validated for use across infancy and with some minor modifications (e.g., age-appropriate toys, child walks into room) for use with children over 2 years (NICHD Early Child Care Research Network, 2001). The Ainsworth Coding system (Ainsworth et al., 1978) was used for infants under 24 months ($n = 8$) and the Preschool Attachment Classification System (PACS; Cassidy, Marvin, & the MacArthur Working Group on Attachment, 1992) for children between 24 and 48 months ($n = 47$). Coding for disorganization was based on Main and Solomon's (1990) guidelines. Infancy and preschool coding systems are regarded as "highly compatible both conceptually and technically" (Moss, Dubois-Comtois, Cyr, Tarabulsy, St-Laurent, & Bernier, 2011, p. 202), with any differences reflecting developmental changes in the child. For example, the preschool system accounts for the fact that more verbal behavior and more controlling behaviors (as an indicator of disorganization) are seen with preschool-aged children. Videotapes were assigned to two inde-

pendent coders (Ellen Moss, University of Quebec, Montreal and her PhD student) expert in both systems and blind to the intervention and pre/post status of each dyad. Tapes were assigned so that each coder scored a mixture of pre/post tapes from different-aged children, but not the pre/post tape for the same child.

Attachment was coded categorically and dimensionally. Coders assigned one of four attachment categories—Secure, Insecure/Avoidant, Insecure/Ambivalent, Insecure/Disorganized— to each dyad. In both systems, a Secure (B) child shows behaviors indicative of using the caregiver as a secure base from which to explore and a safe haven in times of stress. An Insecure/Avoidant (A) child shows physical and emotional avoidance of the caregiver at times of stress while an Insecure/Ambivalent child (C) shows resistance, and/or excessive fussiness or anger, with the caregiver when stressed and limited capacity to be comforted, which also limits exploration. An Insecure/Disorganized (D) child shows inexplicable, odd, contradictory, and/or fearful behavior in the presence of the caregiver, especially when stressed. While the preschool system also enables two further classifications, Insecure Other and Disorganized Controlling, these were included with the Disorganized/Insecure group for analyses, in line with PACS guidelines, because all indicate the lack of a coherent strategy to organize behavior and emotions with the caregiver at reunion (Moss, Cyr, Bureau, Tarabulsy, & Dubois-Comtois, 2005).

Coders also assigned dimensional ratings (range = 1–9) on scales of Security (B) Avoidance (A), Ambivalence (C), and Disorganization (D), with higher scores indicating higher levels of the dimension. These scales have been recently developed and validated by Ellen Moss and colleagues (E. Moss, personal communication, 25 April, 2014; Moss, Lecompte, & Bureau, 2015), based in part on existing security (Cassidy et al., 1992; Main &

TABLE 2. *Means, SDs, and Correlations Among Dependent Variables at Baseline (Time 1)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	M	SD
1. Child Age (in months) (n = 83)	1																47.80	17.58
2. Parent education level (n = 83)	−.02	1															2.87	1.19
3. Security level (n = 55)	.19	.17	1														4.70	1.54
4. Avoidance level (n = 55)	−.34*	−.16	−.48**	1													2.84	1.87
5. Ambivalence level (n = 55)	.06	−.13	−.61**	−.14	1												3.08	2.14
6. Disorganization level (n = 55)	−.11	−.15	−.63**	.34*	.38**	1											2.41	2.21
7. RF (n = 73)	−.23	**.42**	.21	.01	−.12	−.05	1										4.01	1.48
8. Overall Reps (n = 73)	.23	.04	.14	.06	−.09	−.20	.13	1									3.08	.69
9. Hostility (n = 73)	.18	.02	.03	.03	−.07	.12	−.04	−.80**	1								2.95	1.32
10. Joy (n = 73)	−.02	−.05	.27	.08	−.17	−.13	**.26***	.66**	−.49**	1							2.95	.85
11. Bigger/Stronger (n = 73)	.08	.18	.22	.03	−.23	−.17	.18	.74**	−.50**	.55**	1						2.16	.91
12. Kind n = 73	.12	**.31**	.04	.05	−.13	−.08	**.25***	.67**	−.57**	.56**	.60**	1					2.67	.87
13. Mean (n = 73)	−.22	.09	.05	−.13	−.10	.11	.03	−.56**	.55**	−.28*	−.17	−.29*	1				2.60	1.08
14. Weak (n = 73)	**−.26***	−.06	**−.28***	.02	.07	**.30***	.00	−.69**	.29*	−.31**	−.49**	−.20	.24*	1			3.06	1.20
15. Gone (n = 73)	−.16	−.07	.02	.12	−.01	.05	−.15	−.61**	.47**	−.38**	−.42**	−.34**	.20	.41**	1		2.10	1.02
16. Role Reversed (n = 73)	−.11	−.08	−.03	−.19	.12	.06	.04	−.47**	.21	−.05	−.25*	−.12	.01	51**	−.01	1	2.49	1.23

*Correlation is significant at the .05 level (two-tailed). **Correlation is significant at the .01 level (two-tailed).
Spearman's ρ for nonparametric variables (2 and 6).
Parent education (highest) level: 1 = Year 10 high school or less; 2 = Up to end Year 12 high school; 3 = Postsecondary qualification e.g., trade certificate; 4 = Undergraduate degree or diploma; 5 = Postgraduate degree or diploma.

Cassidy, 1985), avoidance (Main & Cassidy, 1985), and disorganization scales (Main & Solomon, 1990). Scores are assigned on each scale depending on the occurrence and quality of several behavioral dimensions (proximity/contact maintaining, body orientation, speech, gaze, and affect) and their combination in an overall strategy as well as whether the child takes an appropriate role in the parent–child relationship.

While we included the avoidance and the ambivalence scales in our preliminary analyses to demonstrate how the four attachment dimensional scales were associated (see Table 2), our testing of attachment hypotheses concerned only changes in security and disorganization levels. Higher security level (Scale B) scores are assigned when children show direct proximity seeking and/or contact maintenance and face-to-face interaction (including through language for older children) when distressed, and fewer of these behaviors when calm and exploring. Scores for disorganization level (Scale D) indicate the degree to which the child is behaviorally disorganized with the caregiver and unable to use the caregiver either as a secure base for exploration or as a source of support for emotional regulation when distressed. These children may show confusion, apprehension, and inexplicable and/or contradictory behaviors such as combined approach/avoidance with the caregiver, especially when distressed. Scores of 1 indicate that no indices of disorganization were seen in the interaction. A scale score of 5 or more generally represents a cutoff point for classification, unless scores on the other scales are equal or higher. For

example, a security-level score of 5 or more typically aligned with a primary attachment classification of secure unless the child also had a disorganized level score of 5 or more. A disorganization level of 5 or more aligned with a child who had one of the disorganized classifications.

Using a reliability set of 21 (19%) tapes to assess coder agreement, κ was .78 on the assignment of one of the four (ABCD) primary attachment categories, indicating acceptable agreement between coders. Interrater reliability was high for the dimensional scales (ICC, single = .86 for security level, Scale B; .85 for disorganization level, Scale D), indicating excellent agreement between the two coders.

Statistical Analyses

All continuous variables were normally distributed, with the exception of disorganization level (Scale D), which was skewed; the majority of dyads showed no indices of disorganized behavior (scores of 1). Square root transformation did not resolve the skewed distribution. Because we hypothesized that disorganization would decrease, for hypotheses examining reduction in disorganization level, we were only concerned with those dyads showing some disorganization at baseline (n = 21). Therefore, dyads with no disorganization at the start [n = 34, disorganization level (D) scores of 1] were excluded from this analysis, and the remaining scores (2–9) showed a normal distribution. Post hoc testing

of any change in disorganization level also was carried out for those showing no disorganization (n = 34) to see if their disorganization level remained low. Hypothesis testing for the parent representation measure used the composite score, Positive Representations (mean of all eight continuous dimensions including negatively worded scales reverse-scored) to minimize inflation of the Type 1 error rate.

Following Hoffman et al. (2006), the significance of changes in pre/post proportions of dichotomous attachment categories: Secure (B) /Insecure (ACD), and Organized (ABC)/Disorganized (D) were tested using McNemar tests (Adedokun & Burgess, 2012). In addition, this approach was used for the two dichotomous scores from the caregiver representations measure (presence or absence of parent statements acknowledging being frightened of/frightening to child).

Hypotheses involving continuous dependent variables (RF, overall representations, security level, and disorganization level) were tested using mixed-design repeated measures analyses of variance (ANOVA). To test whether the intervention had differential effects depending on initial scores, interaction effects also were tested using dichotomous groups derived from Time 1 threshold (scale cutoff) scores as follows: "less than definite RF" (overall RF level ≤5), "no positive representations" (Positive Representations <3), "secure" (security level ≥5 and disorganized level <5), and "disorganized" (disorganization level ≥5). Relevant covariates were included, and interaction effects involving these variables tested as appropriate. Significant interactions (probability values p ≤ .05) were followed up with pairwise comparisons (with Bonferroni adjustments). Ns vary in analyses as 73 parents completed the COSI interview, but Strange Situation data were available for only 55 of 56 participants aged 48 months or younger.

RESULTS

Preliminary Analyses

Table 2 presents baseline pre-intervention means and SDs for all continuous variables and correlations among variables, including demographic variables. Bivariate correlations (Pearson's; Spearman's as appropriate) and independent samples t tests were used to explore relationships among the outcome variables and any potential covariates.

Lower baseline RF was noted in caregivers reporting a history of family violence (n = 29; M = 3.52, SD = 1.35), as compared to caregivers not reporting family violence (n = 44; M = 4.34, SD = 1.48), $t(71)$ = 2.41, p = .017, d = −.57. RF also was lower for those caregivers who had divorced or separated during the child's life (n = 32; M = 3.59, SD = 1.46), as compared with nondivorced/nonseparated caregivers (n = 41; M = 4.34, SD = 1.43), $t(71)$ = 2.20, p = .031, d = .52. Children of parents reporting a history of mental illness (n = 48) were rated lower on baseline security level (M = 4.53, SD = 1.52), as compared with those whose parents did not report mental illness histories (n = 7; M = 5.93, SD = 1.20), $t(53)$ = 2.79, p = .021, d = .94. Divorced/separated

parents (n = 32) had higher Positive Representations, M = 3.26, SD = .84, as compared with nondivorced/nonseparated parents (n = 41; M = 2.95, SD = .51), $t(71)$ = −2.00, p = .050, d = .46. Single parents (n = 29) also had higher Positive Representations (M = 3.36, SD = .80), as compared to 44 partnered parents (M = 2.90, SD = .53), $t(71)$ = −2.73, p = .009, d = .71. There were no other significant associations between psychosocial risk and demographic variables and RF, positive representations, attachment security, and/or disorganization levels.

Attachment scales and representation scales were generally correlated in theoretically expected directions. Overall RF score was significantly positively correlated with positive representational dimensions Joy and Kind. The Weak representational dimension was significantly positively associated with disorganization level (Scale D) and negatively with security level (Scale B). Independent t tests indicated that parents who made explicit statements indicating that they felt frightened of their children (n = 26) had higher mean scores on Weak and Gone dimensions, lower scores on the Bigger/Stronger dimension, and lower Positive Representations scores at baseline than did not-frightened parents, ps < .005. Parents who made explicit statements indicating that they were frightening to their children (n = 47) scored significantly higher on dimensions of Hostility, p = .05, Mean, p < .0005, and Weak, p = .019, and lower on Positive Representations than did parents who did not make such statements, ps < .005. RF scores were not related to security (Scale B) or disorganization level (Scale D) scores and did not differentiate parents who made and did not make statements about being frightened or frightening.

RF scores varied in relation to child age, gender, and caregiver education. Scores were lower for caregivers of older (>48 months) children (M = 3.48, SD = 1.25), as compared with caregivers of younger (<48 months) children (M = 4.33, SD = 1.52), $t(71)$ = −2.44, p = .017, d = 0.59. Caregivers with postsecondary education had higher RF scores (M = 4.44, SD = 1.57), as compared with those with no postsecondary education (M = 3.30, SD = .99), $t(70.45)$ = 3.81, p < .0005, d = 0.83. Caregivers of boys scored lower for RF (M = 3.72, SD = 1.44) than did caregivers of girls (M = 4.43, SD = 1.45), $t(71)$ = 2.07, p = .042, d = 0.49. Sixteen (76%) of the 21 children showing any disorganization (scores >1) at baseline were boys. Male gender also was associated with greater likelihood of reaching a threshold "disorganized" level (disorganization level ≥5), Kruskal–Wallis test, p = .009, with 10 (77%) of these 13 children being boys.

Consequently, when testing hypotheses concerning change in RF and disorganization level, child gender, child age, and parent education were included as covariates where relevant, and possible moderator effects also were considered.

Hypotheses Testing

Change in RF. The mixed-design ANOVA included child gender and age and caregiver education as covariates. Time 1 threshold group (overall RF scores <5 or ≥5) was examined as a potential

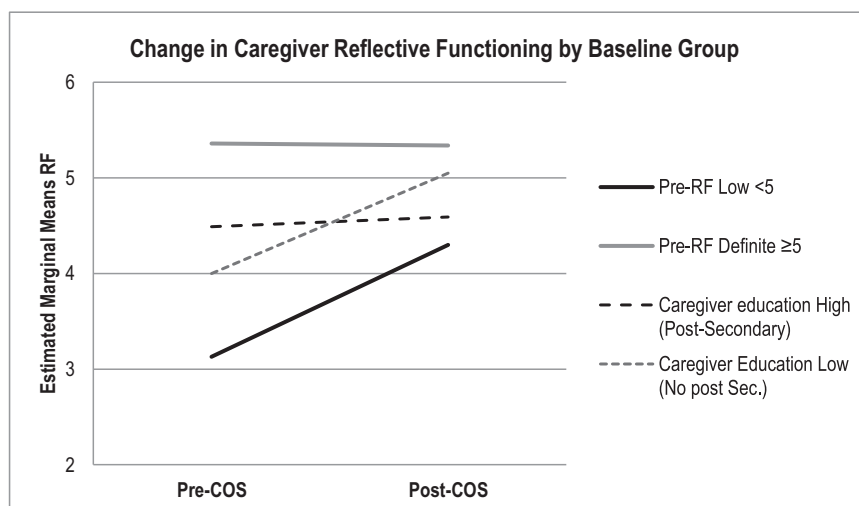**Change in Caregiver Reflective Functioning by Baseline Group**

FIGURE 3.   Change in caregiver reflective functioning after the Circle of Security intervention by baseline group.

moderator. Initially, all potential two-way interaction effects (Time × Child Gender, Time × Child Age, Time × Caregiver Education, and Time × Threshold Group) were tested. Time × Child Gender and Time × Child Age interaction effects were not significant, $ps > .27$, so the analysis was re-run without these interaction terms. Results showed that there was a significant main effect for time, $F(1, 69) = 8.33$, $p = .005$, partial $\eta^2 = .11$, a significant Time × Threshold Group interaction, $F(1, 69) = 9.00$, $p = .004$, partial $\eta^2 = .12$ (both with medium effect sizes), and a significant Time × Caregiver Education interaction, $F(1, 69) = 5.65$, $p = .02$, partial $\eta^2 = .08$ (small to medium effect size). Follow-up pairwise comparisons showed that the change in RF was accounted for by the group of 47 caregivers with low RF scores (<5) pretreatment, $F(1, 69) = 38.72$, $p < .0005$, partial $\eta^2 = .36$ (large effect size) while those with pretreatment RF scores above 5 ($n = 26$) did not change, $F(1, 69) = 2.12$, $p = .95$, partial $\eta^2 < .005$. Pairwise comparisons also showed that parents without postsecondary education ($n = 27$) had significantly increased RF scores posttreatment, $F(1, 69) = 8.99$, $p = .004$, partial $\eta^2 = .12$ (medium effect size) while those with postsecondary education ($n = 46$) showed no significant increase in RF, $F(1, 69) = .26$, $p = .60$, partial $\eta^2 = .004$ (see Figure 3).

Change in caregiving representations. The composite score for overall caregiving representations (Positive Representations) was used for hypothesis testing. Time 1 threshold group (Positive Representations scores <3 or ≥3) was included as a potential moderator variable. There was a significant main effect for time, $F(1, 71) = 115.52$, $p < .0005$, partial $\eta^2 = .62$, and a significant Time × Threshold Group interaction effect, $F(1, 71) = 29.92$, $p < .0005$, partial $\eta^2 = .30$, both with large effect sizes.

Pairwise comparisons showed that there was a significant difference in overall representations scores between the two threshold groups prior to treatment, $F(1, 71) = 123.98$, $p < .0005$, partial $\eta^2 = .64$. Both groups increased their Positive Representations score af-

ter the intervention. However, the improvement was greater for the group with no positive representations at baseline ($n = 32$) as compared with those with at least a few positive representations ($n = 41$) at baseline, with only a small difference between the two groups at Time 2, $F(1, 71) = 4.83$, $p = .031$, partial $\eta^2 = .06$, nonsignificant after Bonferroni adjustment (see Figure 4).

The number of caregivers who made statements about being either frightened of their child, or frightening to their child decreased after the intervention (see Table 3), and McNemar tests indicated that these changes were significant for both frightened, $p < .0005$, and frightening classifications, $p = .023$.

Change in attachment classifications. Of the 55 dyads assessed, 31 (56.4%) were classified as secure before and 34 (61.3%) after the intervention; 13 children (23.6%) were classified as disorganized before and 10 (18.2%) after the intervention. McNemar's tests indicated that neither change was significant, $p = .66$, $p = .61$, respectively (see Table 3).

Change in attachment dimensions. Changes in security level and disorganization level were then tested. For security level, the baseline "secure" group (according to whether they met criteria of Scale B score ≥ 5 and Scale D < 5) was examined as a potential moderator variable. Results indicated a significant main effect for time, $F(1, 53) = 8.26$, $p = .006$, partial $\eta^2 = .14$, and a significant Time × Baseline Group interaction effect, $F(1, 53) = 33.36$, $p < .0005$, partial $\eta^2 = .39$, with medium and large effect sizes, respectively. Pairwise comparisons showed that mean security level decreased for the 32 dyads who were in the "secure" group at baseline, $F(1, 53) = 5.03$, $p = .029$, with a small effect size, partial $\eta^2 = .09$; however, this change was not significant after Bonferroni adjustment, and the mean score at postintervention remained above the clinical threshold for security (i.e., 5). On the other hand, there was a significant increase in mean security level for the 23 "insecure" dyads (i.e., security level <5, and/or disorganization level ≥ 5) at
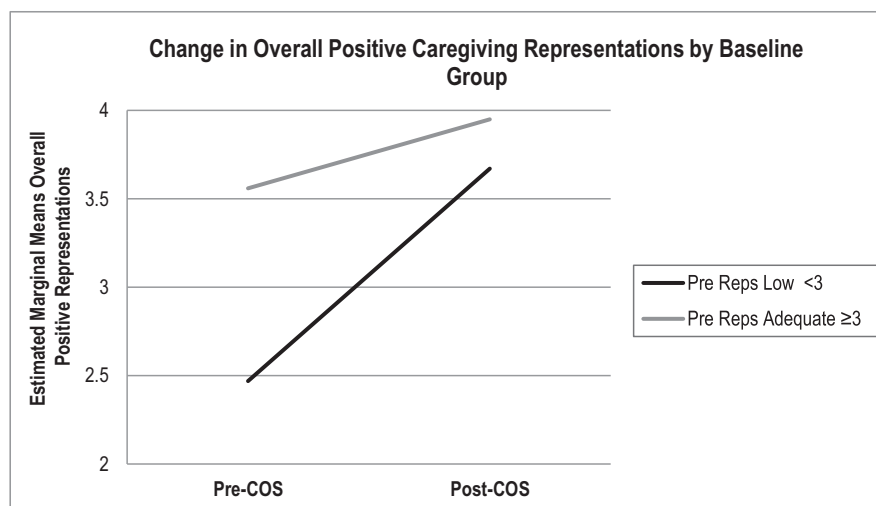
FIGURE 4.   Change in overall positive caregiving representations after the Circle of Security intervention by baseline group.

Time 1, $F(1, 53) = 32.15, p < .000$, with a large effect size, partial $\eta^2 = .38$ (see Figure 5).

For the analysis regarding change in disorganization level, only the 21 children with some indices of disorganization (disorganization level scores > 1) were included. It was not possible to examine moderation by child gender in the repeated measures ANOVA because of the unbalanced group sizes (16 boys, 5 girls). The Time 1 threshold group ("disorganized:" disorganization level ≥ 5) was considered as a moderator. There was a significant main effect for time, $F(1, 19) = 7.26, p = .014$, partial $\eta^2 = .28$, and a significant Time × Baseline Group interaction effect, $F(1, 19) = 10.66, p = .004$, partial $\eta^2 = .36$, both with large effect sizes. Pairwise comparisons indicated that disorganization level decreased significantly for those children ($n = 13$) who were "disorganized" (scores ≥ 5) at baseline, $F(1, 19) = 23.31, p < .0005$, partial $\eta^2 = .55$, but did not change for those who were "not disorganized" ($n = 8$, baseline scores < 5), $F(1, 19) = .13, p = .721$, partial $\eta^2 = .007$ (see Figure 5). To account for the possible impact of gender,

the analysis was repeated just for boys ($n = 16$), and results were essentially the same, with a significant main effect for time, $F(1, 14) = 7.62, p = .015$, partial $\eta^2 = .35$, and a significant interaction effect with baseline "disorganized" group, $F(1, 14) = 9.08, p = .009$, partial $\eta^2 = .39$. This suggested that changes in disorganization levels for those with any disorganization at Time 1 were not related to gender.

A further analysis examined changes in disorganization level for the 34 children who showed no disorganization at baseline (disorganization level score = 1). Mean scores increased significantly to 1.64 ($SD = 1.3$), $t = 2.90(33), p = .007$, but remained well below the "disorganized" threshold level (≥5) at Time 2.

Post hoc tests: Caregiver Representations. Because the Caregiver Representations measure was developed for the current study and a composite score used for hypothesis testing, post hoc paired t tests were conducted to examine change on the various scales. Results indicated that all dimensions of Caregiving Representations
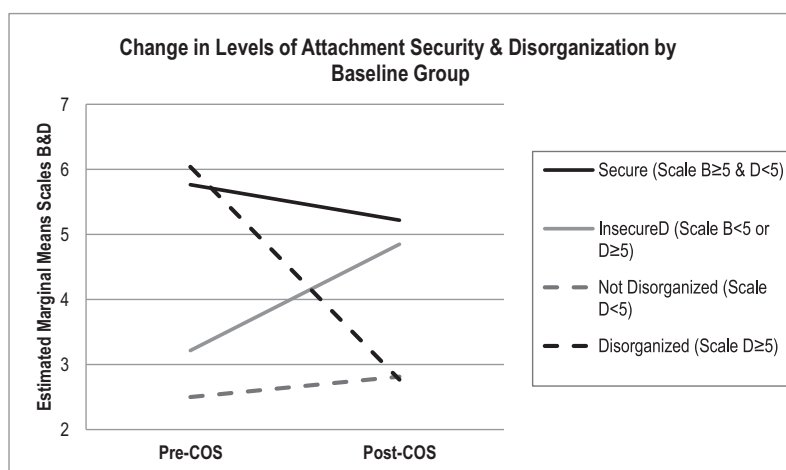

FIGURE 5.   Change in level of attachment security after the Circle of Security intervention by baseline group.

TABLE 3. *Pre-/Postintervention Change by Category: Caregiver Frightened/Frightening Representation, Child Attachment Security/Organization*

Pretreatment Category	Posttreatment Category				Pretreatment Total
	Frightened		Not Frightened		
	n	*%*	*n*	*%*	
Frightened	4	15.4	22	84.6	26
Not Frightened	2	4.3	45	95.7	47
Posttreatment Total	6		67		73
	Frightening		Not Frightening		
	n	*%*	*n*	*%*	
Frightening	29	63	18	38.3	47
Not Frightening	6	23.1	20	76.9	26
Posttreatment Total	35		38		73
	Secure		Insecure		
	n	*%*	*n*	*%*	
Secure	22	71.0	9	29.0	31
Insecure	12	50.0	12	50.0	24
Posttreatment Total	34		21		55
	Organized		Disorganized		
	n	*%*	*n*	*%*	
Organized	36	85.7	6	14.3	42
Disorganized	9	69.2	4	30.8	13
Posttreatment Total	45		10		55

Note. Percentages provided reflect the percentage of children classified in each group at Time 1 (listed in rows) who were then classified in each group (listed in columns) at Time 2.

improved significantly, with medium to large effect sizes, with the exception of Joy/Pleasure (small effect size) (see Table 4).

DISCUSSION

The COS 20-week intervention aims to increase child attachment security and reduce disorganization by optimizing caregivers' rela-

tional capacities, targeting caregiving representations and capacity for RF in particular (Powell et al., 2014). Current findings suggest that the intervention is effective in achieving these objectives for those in this clinically referred sample who completed, with changes largely explained by improvements for those caregivers and dyads with suboptimal scores on the various indices of relationship functioning at the pretreatment assessment.

Those caregivers with no definite RF prior to intervention showed improved RF, and caregiving representations became more positive across the sample. Further, those children whose scores indicated probable "insecure" attachment prior to the intervention showed significant increases in security levels, and those who were disorganized prior to the intervention showed significant reductions in disorganization scores.

Change in RF

The change in caregivers' RF was clinically as well as statistically meaningful, with the overall mean score after treatment approaching the cutoff score of 5, indicative of definite reflective function (Fonagy et al., 1998; Slade et al., 2005). The medium to large effect sizes compare favorably with those reported by other researchers after both short- or longer term attachment-based interventions targeting RF (e.g., Suchman et al., 2010; Toth, Rogosch, & Cicchetti, 2008); however, the absence of a control group and some potential coder bias need to be acknowledged in the current study. While every effort was made to ensure that coders were blind regarding whether transcripts were from pre- or postinterviews and any references to participation were removed from interview transcripts, coders may have inferred program participation because the way parents spoke about their relationships with their children differed, for example, through use of COS language, before and after intervention.

Previous findings on changing RF through attachment-based interventions have been mixed; some studies have reported small improvements (Pajulo et al., 2012; Suchman et al., 2010); one has reported no change in a treatment group as compared to a decrease in RF in a comparison group (Sleed, Baradon, & Fonagy, 2013); one has reported small changes, but only for subgroups

TABLE 4. *Time 1 (T1) and Time 2 (T2) Means, SDs, and Differences in Caregiver Representations*

Scale (*n* = 73)	T1 *M* (*SD*)	T2 *M* (*SD*)	*M* Difference (*SD*)	*T* score (*df*)	Significance (two-tailed)	Cohen's *d*
Overall Reps	3.08 (0.69)	3.83 (0.57)	0.75 (0.74)	8.57 (72)	.000	1.01
Hostility*	2.95 (1.32)	2.16 (1.09)	−0.78 (1.25)	−5.34 (72)	.000	−0.62
Joy	2.95 (0.85)	3.29 (0.74)	0.34 (1.06)	2.77 (72)	.007	0.33
Bigger/Stronger	2.16 (0.91)	3.25 (1.00)	1.08 (1.15)	8.03 (72)	.000	0.94
Kind	2.67 (0.87)	3.27 (0.84)	0.60 (1.04)	4.96 (72)	.000	0.58
Mean*	2.60 (1.08)	1.92 (0.76)	−0.69 (1.04)	−5.63 (72)	.000	−0.66
Weak*	3.06 (1.20)	2.00 (0.94)	−1.06 (1.40)	−6.42 (72)	.000	−0.76
Gone*	2.01 (1.02)	1.51 (0.80)	−0.51 (1.13)	−3.83 (72)	.000	−0.45
Role Reversed*	2.49 (1.23)	1.59 (0.57)	−0.90 (1.30)	−5.95 (72)	.000	−0.69

For positive representation dimensions, optimal or adequate scores are at or above cutoff score 3. *For negative representation dimensions, optimal or adequate scores are below cutoff score 3. Cohen's *d* effect sizes: 0.2–0.3 = "small," ˜0.5 = "medium," and 0.8–infinity = "large" (Cohen, 1988).

within the intervention group (Sadler et al., 2013); and others have reported conflicting findings on the same study population; that it, improvement (Toth et al., 2008) versus no change (Vrieze, 2011), perhaps related to the use of different narrative interviews to score RF on different occasions.

Indeed, comparing results across studies is difficult because of differences in study design. Some studies have included control groups, but the current study did not. Different narrative interviews have been used to elicit RF, although most have used the same scoring scale (Fonagy et al., 1998) or its (Parent Development Interview-Revised; Slade, et al., 2004) adaptation (Slade et al., 2005). Most studies have used the central tendency to calculate an overall score; however, one study has reported a mean score (Suchman et al., 2010), and some have used lower cutoff scores (four) to delineate adequate levels of RF (Sadler et al., 2013; Toth et al., 2008).

RF in the current study was lower for caregivers of older children, caregivers of boys, and caregivers with low education. We also noted lower RF in parents reporting prior family violence and/or separation and divorce. An association between lower parental RF and lower education has previously been reported by Stacks et al. (2014). Together, these findings raise interesting questions about parental RF and education: If RF reflects a higher order metacognitive capacity (Slade, 2005a), does education play a role in its development or does low RF limit participation in education in some way? Our finding that parent education level moderated the effects of the intervention on RF, whereby less educated parents showed the most improvement, suggests, however, that low education level does not preclude the subsequent development of RF through an intervention such as the COS.

Taken together, findings to date have suggested that demographic and psychosocial risk profiles of study populations may play a role in contributing to different findings about RF in parents (Ordway et al., 2014; Sadler et al., 2013; Stacks et al., 2014; Vrieze, 2011) and that more research is needed. Although two shorter interventions have had some positive effects on parents' RF (Sleed et al., 2013, Suchman et al., 2010), treatment dosage also may be important (Suchman et al., 2010). Most interventions that have shown improved RF have been intensive and of at least 20 weeks' duration. While acknowledging that the current findings need to be replicated in a larger sample in a study including a control group, they provide preliminary evidence that the 20-week COS intervention promotes RF.

Change in Caregiver Representations

In a novel contribution, the current study examined not only changes in reflective capacity but also the content of caregivers' representations about themselves in the caregiving role and their child. A coding scale was developed with a particular focus on aspects of caregiving targeted by the COS intervention. Results indicated more positive representations after the intervention, and subsequent analyses showed that each of the dimensions improved, with medium to large effect sizes. Broadly speaking, after treat-

ment, caregivers described themselves in ways more aligned with the COS dictum "bigger, stronger, wiser, kind" (Powell et al., 2014, p. 31). Caregivers not only made statements indicating more joy and less hostility in their relationship with the index child but also perceived themselves as more capable of parenting the child ("bigger stronger"), and spoke of showing more support for, and kindness toward, the child ("kind") and being less punitive or withholding of emotional support ("mean") and less helpless ("weak") when the child needed the parent to be firm or take charge. Importantly, in relation to caregiving styles associated with risk for disorganized attachment, caregivers made fewer comments suggesting that they were physically or psychologically absent (gone), gave fewer examples of role-reversal, and were less likely to make references to themselves as frightened of or frightening to the child.

There is still limited research examining change in caregiving representations after attachment-based interventions with an explicit focus on mentalization. Suchman et al. (2010) reported modest positive changes in "coherence" and "sensitivity" of caregiver representations assessed using the Working Model of the Child Interview (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997) after a 12-week *Mother–Toddler Program* with a small sample of substance-abusing mothers of toddlers. In contrast, Sleed et al. (2013) found no treatment group differences in "warmth" and "invasion" indices of a self-report caregiver representations measure after an 8-week treatment with incarcerated mothers. The type and duration of the intervention, sample characteristics, and differences in how representations were measured may all contribute to these different findings.

While some caution is warranted in interpreting current findings given the absence of a comparison group, results suggest that the new representations measure used in conjunction with the COSI may have both clinical and research utility, as it can assist in identification of individualized treatment goals as well as in assessment of the effectiveness of the intervention. Further, study findings support the proposition that RF and representations are related, but distinct, constructs (Slade, 2005a; Steele & Steele, 2008) that can be separately identified from different aspects of the same narrative. Overall, after the intervention, parents/caregivers in the current study made fewer negative and more positive statements when talking about their relationship with their child, associated with an enhanced sense of capacity as a parent (Bigger/Stronger) and desire/willingness to support the child (Kind).

Attachment Security and Disorganization

Given the high levels of demographic and psychosocial risks as well as clinical issues in the referred population, it was surprising that so many children (56%) were categorized as being secure at baseline. While the number of children categorized as secure increased slightly and the number classified as disorganized decreased, these changes were not significant, and a small number of children moved from a secure to an insecure classification. It is perhaps for these reasons, and the already high rates of security, that we were unable to replicate earlier findings showing an

increased proportion of those classified with secure and disorganized attachment after COS therapy (Hoffman et al., 2006).

Other researchers using a shorter 10- to 12-week COS intervention with a clinical population of depressed or traumatized mothers (Rosenblum, Muzik, Marcus, Marvin, & Whelan, 2010) have found all preschool-aged children to be classified as disorganized in immediate postintervention Strange Situation assessments of attachment (Cassidy et al., 1992), but classified as secure 6 months later, perhaps related to timing of follow-up. These findings raise the possibility that our postassessments, conducted in the immediate aftermath of treatment, may have captured incomplete changes taking place in parent–child attachments and that a longer follow-up may have yielded different categorical results.

We also considered dimensions of attachment security and disorganization, and found an overall increase in the level of security after the intervention; this effect was largely explained by those who showed low levels of secure behaviors prior to the intervention. Our consideration of posttreatment changes in attachment disorganization level for the 21 children who showed at least minimal signs of disorganization at baseline indicated substantial reductions in disorganization levels only for the most at risk (i.e., the "disorganized" subgroup). These changes were both statistically and clinically significant, with mean disorganization level after treatment for this subsample well below the cutoff score. The small, but significant, increases in disorganization levels in the group of children showing no indices of disorganization before intervention was unexpected, although overall levels of disorganization in this nondisorganized group remained low. This small elevation may reflect a process of reorganization in the relationship as the child adjusts to changes experienced in interaction with the parent, as suggested by Rosenblum et al. (2010) in the study discussed earlier.

Unlike some other attachment-based interventions, the intensive COS intervention explicitly targets the caregiving antecedents of disorganization (van IJzendoorn, Bakermans-Kranenburg, & Juffer, 2005; Zanetti, Powell, Cooper, & Hoffman, 2011), and prior research has suggested that it may be effective in preventing disorganization in high-risk populations (Cassidy et al., 2010). Findings in this study suggest the intervention also may be effective in reducing already established high disorganization levels, but caution is warranted in interpreting these findings due to the small number of children, especially girls, with disorganized attachment in the current study.

Taken together, study findings also confirm the value of using both categorical and dimensional approaches for analysis of attachment data (Cummings, 2003; Fraley & Roisman, 2014). The small sample size (attachment data could be examined only for the 55 younger children) precluded more fine-grained analyses of different insecure patterns, and findings on dimensional changes in security and disorganization levels, although highly significant with large effect sizes, are preliminary and would need to be replicated with a larger sample.

Do All Families Respond to COS in the Same Way?

Cassidy et al. (2011) previously reported that response to a four-session version of the COS intervention differed depending on maternal and child characteristics (in this case, maternal attachment style and infant irritability level). In the current study, we sought to explore whether the 20-week intervention worked regardless of child age, parent education, and child gender, and were particularly interested in differential effects related to relationship indices prior to treatment. None of the demographic variables moderated the effectiveness of the intervention, with the exception that caregivers with lower education showed more improvement in reflective function. Importantly those starting with less optimal reflective function, caregiving representations, attachment security, and disorganization levels showed most benefit. To date, no study has reported on the use of the COS with children older than preschool age. While attachment effects were not examined for children older than 4 years, findings that child age did not moderate positive intervention effects on caregiver RF and representations suggest that the intervention is effective for clinically referred caregivers with children up to age 8 years.

Relationships Among Constructs and Models of Change

While the primary objective of the study was to evaluate change across three key indicators of relationship functioning, findings regarding relationships among the constructs assessed also are informative. As noted earlier, the use of a measure of parent/caregiver representations alongside assessment of RF confirmed that these constructs are related, but distinct. The question remains whether higher levels of RF result from, or foster, more positive aspects of caregivers' representation of their relationship. The effect size for change in overall representations was greater than that for change in RF, and improvement in representations occurred across the sample, and not only for those starting with low scores, unlike RF, where change was limited to those whose scores were low to start with.

Contrary to theoretical prediction (Slade, 2005a; Steele & Steele, 2008) and some prior empirical evidence that higher RF in parents was associated with subsequent secure attachment in infants (Fonagy et al., 1991; Slade, 2005b), RF in the current study was not correlated with indices of attachment security or disorganization before or after treatment. Toth et al. (2008) also reported that maternal RF (assessed from the Adult Attachment Interview) did not differ according to child attachment classification before or after an attachment-based intervention with depressed mothers of toddlers. This study also reported that change in RF did not mediate change in child attachment, raising questions about the role of RF as a mechanism of change in attachment-based interventions.

Recently, Stacks et al. (2014) suggested that RF is more likely to be associated with maternal sensitivity and attunement, not assessed in the current study. We did find, however, some modest associations between parent representations and child

attachment indices. Higher scores for "weak" representations (indicating greater caregiving helplessness) were associated with lower security scores and more child behaviors indicative of disorganization. This finding is in line with Solomon and George's research (George & Solomon, 1989, 1996; Solomon & George, 1996; George & Solomon, 2011a), showing that caregiving representations indicating a perceived capacity to stay in charge and protect children were associated with a lower likelihood of disorganized attachment.

Costs and Benefits of the COS 20-Week Intervention

Reviews discussing relations between intensity and effectiveness of attachment-based interventions (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Egeland, Weinfeld, Bousquet, & Cheng, 2000; Ziv, 2005) have suggested that for some families with lower levels of background risk, a short, targeted intervention may be most effective in improving maternal sensitivity and attachment security, but for those with overall higher levels of risk, "more is better" (Ziv, 2005, p. 71). More recently, Moss et al. (2011) reported positive changes in sensitivity and attachment security with a high-risk sample after an 8-week, home-based, individualized attachment-based intervention; however, they highlighted the need for randomized trials "to examine the issue of dosage" (p. 206), particularly with higher risk samples.

Results of the current study and those of a prior study (Hoffman et al., 2006) suggest that the COS 20-week group intervention is not only effective in improving all aspects of the relationship that it directly targets (parent RF and representations and child attachment, including reducing disorganization levels) but also that costs, benefits, engagement, and retention compare favorably with other individualized, intensive, attachment-based interventions (for a review, see Berlin et al., 2008). Intensive interventions require significant resources, however, associated with the use of videotape, the provision of therapist training, and reflective supervision and/or staffing for the extended duration of the intervention. In this regard, the COS 20-week intervention has some advantages: It is time-limited, center-based, and delivered in groups (while still providing an individualized approach).

Nonetheless, it is important to acknowledge that resources to support an intensive treatment approach, like the 20-week COS intervention, may not be readily available and that intensive treatment approaches in general may be beyond the capacity of many smaller clinics. The COS originators have developed a shorter, and less intensive, eight-session protocol called *Circle of Security Parenting* (COS-P; Cooper, Hoffman, & Powell, 2009), which can be delivered in groups or individually, whose facilitators attend a shorter training workshop (4 days vs. 10 days), and which has fewer supervision requirements. This intervention provides a framework to help parents understand and respond to individual struggles in their own caregiving relationships. Unlike the 20-week protocol, the shorter version does not involve individualized assessment and treatment planning (including videotaping of each dyad), and so requires parents to accurately assess their own struggles based on observing video examples of other parent–child interactions and use this learning to respond to their own specific issues (Glen Cooper, personal communication, 4 May 2015). Combined evidence suggests different interventions are needed for different people and contexts (Berlin, 2005), and more research is needed to explore the relative benefits of both forms of the COS intervention, to compare these with other interventions, treatment as usual and/or no treatment, and to clarify what works best for whom.

Limitations and Future Directions

While findings are encouraging, several limitations need to be acknowledged. Because the current study used clinical data already collected and archived, it was not possible to include a control or comparison group, and the follow-up assessment was done very soon after treatment ended. While minimal attendance (16 of 20 sessions) was required for treatment completion, we do not have complete "dosage" data. Replication of these results with a control group and with a longer term follow-up is therefore important. Further, although attachment-based interventions in general aim to change child attachment by changing parent behavior (increasing sensitivity and responsiveness to the child's needs), this study did not assess changes in caregiver behavior, so an explanatory model could not be tested. Questions about the attachment transmission gap from caregivers' attachment and caregiving representations to their child's attachment remain open. Future research needs to examine whether parent behavior changes in response to the COS intervention, whether these changes are associated with changes in RF and parent caregiving representations, and whether these changes mediate or moderate changes in child attachment and disorganization.

Various features of the sample also need to be considered in interpreting the findings. The sample size was small. This precluded a more detailed analysis of the different insecure attachment categories; however, effect sizes were generally impressive. As noted earlier, the small number of children showing disorganized behavior limits interpretation of these findings. Further, while the sample was ethnically representative of the broader Australian population, and high-risk in many respects (e.g., 89% of caregivers reported histories of mental illness, 33% reported histories of domestic violence, and there was evidence of substantiated maltreatment in 19% of families), 60% were well-educated, typical of the demographic profile in the city where the research was done. Consequently, caution is indicated in generalizing these findings to samples higher on overall social adversity.

Finally, the follow-up assessment was conducted soon after treatment finished, and attachment changes in some children may have still been emerging (Rosenblum et al., 2010). It also may be too early to conclude that parent changes in RF and representations were integrated, ongoing, and meaningful. So soon after treatment, there may have been some "teaching" effect where some parents may have learned to "talk the talk," repeating ideas and phrases just learned, but were not fully integrated. A longer follow-up after 6 months is therefore recommended.

Conclusions

This study of clinically referred families who participated in the 20-week COS intervention showed improvements in caregiver RF, representations, and indices of child attachment security and disorganization. Findings suggest that the intervention is effective with those who need it most and that change occurs in the aspects of relationship functioning that were particularly targeted. A new measure of caregiving representations, tailored for use with the COS intervention, was a novel contribution with both clinical and research application. Questions remain whether these treatment effects are likely to be integrated and sustained, about mechanisms of change, and more broadly, how caregiver RF, representations, and behavior interact to influence child attachment outcomes.

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