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# The Circle of Security Parenting Program (COS-P): A Randomized Controlled Trial of a Low Intensity, Individualized Attachment-Based Program With at-Risk Caregivers

Melanie J. Zimmer-Gembeck
Griffith University, School of Applied Psychology and Menzies Health Institute of Queensland

Julia Rudolph
Elia-Jade Edwards
Griffith University, School of Applied Psychology

Kellie Swan
Shawna M. Campbell
Griffith University, School of Applied Psychology and Menzies Health Institute of Queensland

Tanya Hawes
Haley J. Webb
Griffith University, School of Applied Psychology

**The Circle of Security–Parenting Intervention (COS-P; Cooper et al., 2009) is a psychoeducational program for caregivers of young children that has been widely disseminated. The program is founded in attachment theory and relies on computer-delivered content and parent reflection and discussion to teach concepts of safety and security to promote better caregiver-child relationships and child well-being. The present study is a randomized controlled trial of COS-P, individually delivered to 85 Australian caregivers (51 COS-P, 34 waitlist control) who reported parenting distress and child disruptive behaviors. Caregivers completed a baseline assessment and repeated the assessment after completion of COS-P or 8 weeks on the waitlist. Caregivers completed surveys to report child symptoms, and parenting stress, anxious and avoidant attachment, reflective functioning, parenting practices, and depressive symptoms. No differences in COS-P vs. waitlist participants were found at baseline. Analyses of complete data (35 COS-P, 25-26 waitlist) revealed a greater decline in caregivers' attachment anxiety and negative parenting relative to waitlist, but only attachment anxiety in intent-to-treat analyses. Other improvements were found, but these extended to both the COS-P and waitlist conditions and did not differ between conditions. Overall, effects of COS-P were small and rarely significant, suggesting the need to consider alternative programs that have evidence of effectiveness when providing services to at-risk families.**

*Keywords:* parenting; Circle of Security; externalizing behaviors; stress; reflective functioning

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Address correspondence to Melanie J. Zimmer-Gembeck, Ph.D., Griffith University, School of Applied Psychology, Parklands Dr, G40_7.86, Southport, QLD 4222. e-mail: m.zimmer-gembeck@griffith.edu.au.



ATTACHMENT THEORY (Bowlby, 1969) and its extensions (Ainsworth et al., 1978; Sroufe, 2005) have led to decades of research on parent-child interactions, and parenting practices, styles and behaviors

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to investigate whether they serve as foundations for children's development across behavioral, emotional, cognitive, attentional and physiological domains. The foundational assumption of attachment theory is that the formation of caregiver-child attachment relationships is innate and necessary for human survival (Bowlby, 1969). However, although almost universally formed, attachment relationships can vary and much research has concentrated on identifying when and why they may be secure or insecure (Ainsworth et al., 1978). More specifically, when observed using the Strange Situation to assess caregiver-child attachment, secure relationships are identified through a child's ability to explore the environment in the presence of a caregiver and to rely on the caregiver as a secure base for comfort and safety when needed. In contrast, an insecure caregiver-child attachment relationship is indicated by gaps in signs of child comfort and safe haven behaviors (e.g., exploration of the environment) in the presence of a caregiver. Insecure caregiver-child attachment has multiple forms and might also be indicated by signs of child fear or anxiety, anger, or resistance to soothing by a caregiver when the environment is novel or threatening (e.g., in the presence of a stranger). Moreover, early attachment relationships have implications for children's development and adjustment. A secure attachment has been associated with children's better executive functioning in areas such as working memory, cognitive flexibility, inhibitory control (Bernier et al., 2012), language skills (Belsky & Fearon, 2002), and socioemotional competence (Bohlin et al., 2000; Sroufe, 2005). Insecure attachment has been associated with children's emotion regulation deficits, and mental health and conduct problems (Fearon et al., 2010; Groh et al., 2012; Thompson, 2016; Zimmer-Gembeck et al., 2017).

Alongside defining and identifying variations in the quality of the caregiver-child attachment relationship, research has concentrated on how secure or insecure attachment relationships emerge. One of the foundations of attachment theory is the focus on caregiver sensitivity as the most direct correlate of whether caregiver-child attachment status is secure or insecure. Caregiver sensitivity is the ability to appropriately attend and respond to infant signalling of emotional and physical needs (Ainsworth et al., 1978; Cassidy, Shaver, et al., 2017 Mesman et al., 2012). This central feature of attachment theory has been supported; caregiver sensitivity has been shown to be an important precursor of parent-child attachment quality (De Wolff & van IJzendoorn, 1997; Lucassen et al., 2011), a predictor of secure attachment continuity throughout childhood and into adolescence (Beijersbergen et al., 2012), and is associated with lower risk of psychopathology and school underachievement in longitudinal studies (Carlson, 1998, Moss & St-Laurent, 2001). Caregiver sensitivity is also related to other child outcomes, such as language development and social competence (Barnett et al., 2012), and is associated with lower levels of child internalizing and externalizing behaviors (Zimmer-Gembeck et al., 2015).

Attachment theory and the evidence for the roles of parent-child attachment and caregiver sensitivity in child development have led to a proliferation of programs designed to enhance attachment understanding, and foster caregivers' sensitivity and effective parenting practices (Berlin et al., 2016; Cassidy, Brett, et al., 2017; Cassidy, Shaver, et al., 2017; Weisenmuller & Hilton, 2021; Yaholkoski et al., 2016). Such programs have relied on a variety of approaches, ranging from psychoeducation delivered in a brief period of time (individually or in groups) to therapeutic interventions that require high levels of practitioner skills, training and supervision, and specialist equipment and assessment techniques; the most intensive of these have generally been shown to result in the largest improvements for parents and their children (Barlow et al., 2016; Rayce et al., 2017; Thomas et al, 2017). Even given a particular theoretical approach, programs can vary in content (e.g., psychoeducation or role-plays), format (e.g., individual or group), and intensity (e.g., 8 sessions or 20 sessions). For example, one suite of approaches has been called Circle of Security (COS; Cooper et al., 2009; Marvin et al., 2002; Powell et al., 2013). We report here a randomized controlled trial of one of the least-intensive forms of COS in terms of training, resources and time-commitment from families—the COS Parenting Program (COS-P). Here, COS-P was conducted within regular practice in a university-based psychology clinic setting in an individualized format of 8 weekly sessions with at-risk parents of children who had disruptive behavior problems.

## THE CIRCLE OF SECURITY PROGRAM

COS is a theory-driven intervention, originally designed for primary caregivers of toddlers and young children showing signs of internalizing or externalizing disorder. COS targets three fundamental motivational systems: the attachment system, the exploratory system, and the caregiver system (Marvin et al., 2002; Risholm Mothander

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et al., 2018) via teaching attachment theory to caregivers of young children early, as a way to improve parenting sensitivity, parent-child attachment, and caregivers' own attachment (i.e., their working models of relationships with their children and others). With the help of a specially trained provider, caregivers are encouraged to reflect on their children's behaviors, thoughts, feelings and needs, as well as their own experience of caregiving and their own attachment patterns. The aim of this psychoeducational and reflective process is to enhance caregiver sensitivity and responsivity towards their children, thereby allowing children's felt security as a way to improve caregiver-child relationships, decrease children's symptoms and increase child and family well-being.

The original COS intervention was designed as a 20-week group program (Huber et al., 2016), but this format was not easily disseminated and was modified with widespread public health impact in mind. This is now widely available as COS-P (Cooper et al., 2009). COS-P was developed drawing on the same theoretical foundations and the essential educational elements of the 20-week group COS format. COS-P is a manualized, 8-session psychoeducational program founded in attachment theory and presented through discussion with a provider enhanced with videos (Horton & Murray, 2015; Maupin et al., 2017; see session content in Maxwell et al., 2021). This structure and the content lend themselves to either group or individual delivery by providers with varying levels of experience. As in all COS approaches, the COS "graphic" is central to COS-P. The graphic explains attachment theory using a circle (the *circle of security*) encompassing a secure base and a haven of safety (Marvin et al., 2002; also see the graphic in Maxwell et al., 2021). This pictorial representation assists caregivers in understanding: (a) a child's need for exploration while in the presence of a caregiver who is available to help if affective or behavioral assistance is needed and who enjoys his/her activities with him/her (the top of the circle), (b) a child's need for a caregiver to welcome them in for protection, delight, comfort and to help them organize their feeling or behaviors (bottom of the circle), if needed, and (c) the formula for secure attachment, which is to "always be bigger, stronger, wiser and kind... Whenever possible follow my child's need. ... Whenever necessary, take charge" (Marvin et al., 2002, p. 109). The COS-P videos include information relevant to the circle of security, and provides examples of caregivers interacting with their children as they display different emotional needs and progress through the circle. Providers of COS-P pause the videos at designated points and encourage reflection and conversation about caregivers' experiences and relationships with their children. Although COS-P was designed to be conducted with groups of caregivers, individualized service is also easily provided.

## PREVIOUS EVALUATIONS OF COS-P

COS-P is very popular with providers of support programs for parents and is being implemented in numerous countries around the world. However, additional efficacy or effectiveness studies of COS-P are needed, especially given mixed findings in the 10 published previous evaluations of COS-P we located (see Table 1). Across these studies, sample sizes ranged from 8–9 (Coleman, 2014; Rose et al., 2018) to 256 caregivers (with more than 170 included in analyses; Maxwell et al., 2021). Of these studies, there were two randomized controlled trials (Cassidy, Brett, et al., 2017 – COS-P vs. waitlist control; Risholm Mothander et al., 2018 – COS-P + treatment-as-usual vs. treatment-as-usual) and another three that included a comparison condition (Gray, 2015; Horton & Murray, 2015; Maxwell et al., 2021). In general, there is mixed evidence for parent and child benefits of COS-P across these studies. For example, COS-P has been found to improve caregiver-report of child inhibitory control (Cassidy, Brett, et al., 2017), and reflective functioning (Kohlhoff et al., 2016; Maxwell et al., 2021). Yet, in contrast, no significant improvements were found for similar child and parent outcomes in other studies (child behavior problems: Cassidy, Brett, et al., 2017, and Maxwell et al., 2021; caregiver reflective functioning: Gray, 2015; Kohlhoff et al. 2016; Maupin et al., 2017; Risholm Mothander et al., 2018). Nevertheless, positive COS-P program effects have been found for other measured outcomes, including parent stress and depression (Coleman, 2014; Krishnamoorthy et al., 2020; Maxwell et al., 2021), caregiver-reported self-efficacy (Gray, 2015; Maxwell et al., 2021; Rose et al., 2018), and self-reported maternal unsupportive responses and empathy (Cassidy, Brett, et al., 2017; Kohlhoff et al., 2016; Maxwell et al., 2021). In six of these past evaluations of COS-P, the participants were caregivers with some degree of vulnerability or risk, such as parenting skill deficits (Maxwell et al., 2021; Risholm Mothander et al., 2018), financial stress (Cassidy, Brett, et al., 2017; Maupin et al., 2017), or substance misuse (Coleman, 2014; Horton & Murray, 2015).

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Table 1
Summary of Previous COS-P Effectiveness Studies

| Study | Participants | Design | Group Differences at pre-test | Significant Improvement[1] | No Significant Improvement[1] |
|---|---|---|---|---|---|
| 1. Cassidy, Brett, et al., 2017 | 141 low-income carers of Head Start children; USA | Randomized controlled trial; COS-P ($n$ = 75) compared to waitlist ($n$ = 66) | Intervention group younger and had more single mothers | – Unsupportive responses to child distress<br>– Child inhibitory control | – Supportive responses to child distress<br>– Child attachment<br>– Child cognitive flexibility<br>– Child internalizing symptoms<br>– Child externalizing behavior |
| 2. Coleman, 2014 | 8 opiate dependent caregivers; USA | Cohort study | Not applicable | – Drug use<br>– Parent stress, depression, and anxiety | – Caregiver helplessness |
| 3. Gray, 2015 | 51 family daycare providers with child (age not reported); USA | Self-selected treatment group ($n$ = 34) compared to group recruited from a USA state database ($n$ = 17) | Intervention group more likely to be learning English and born outside of the USA | – Efficacy in managing child's challenging behavior | – Job stress-related resources<br>– Depressive symptoms<br>– Reflective functioning |
| 4. Horton & Murray, 2015 | 15 carers of young children in residential substance use treatment; USA | Comparison of treatment completers (n = 9), partial attendance (n = 4) and no attendance (n = 2) | Not reported | – Lax discipline | – Emotion regulation (reappraisal and suppression)<br>– Perceived causes of successful and unsuccessful interactions with children<br>– Overreactive discipline |
| 5. Kohlhoff et al., 2016 | 15 mothers of toddlers aged under 2 years; Australia | Cohort study | Not applicable | – Certainty about child's mental states (reflective functioning)<br>– Helplessness<br>– Perceptions of fear in self and child<br>– Rejection and anger<br>– Stress | – Pre-mentalizing (reflective functioning) |
| 6. Krishnamoorthy et al., 2020 | 54 foster carers of children aged 6 to 12 years; Australia | Cohort study | Not applicable | – Stress | – Parent-child relationship: (parental support, satisfaction, involvement, communication, limit setting, and autonomy)<br>– Positive and negative attributes of child |

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| | | | | | |
|---|---|---|---|---|---|
| 7. Maxwell et al., 2021 | 256 mothers self-identified early parenting challenges; Australia | Non-random comparison: COS-P ($n$ = 201) compared to waitlist ($n$ = 55); Sample for main analyses was about $n$ = 177 due to missing data. | – Treatment group parents older | – Mentalizing (reflective functioning)<br>– Self-efficacy<br>– Helplessness<br>– Hostility<br>– Depressive symptoms | – Child difficultness |
| 8. Maupin et al., 2017 | 131 low socioeconomic status mothers living in urban areas; $N$ ranged from 25 to 71 in main analyses; USA | Cohort study with a primary focus on feasibility and acceptability of COS-P | Not applicable | – Depressive symptoms | – Sense of competence and efficacy<br>– Reflective functioning<br>– Parent-child relationship |
| 9. Risholm Mothander et al, 2018 | 52 carers of children aged 0 to 4 years with attending infant mental health clinic; Sweden | Randomized controlled trial; COS-P + TAU (n = 28) compared to TAU (n = 24) | – COS-P group had significantly older children, contained less married/cohabitating parents, and children had more medical/developmental conditions<br>– TAU group had greater parental depression | | – Representations of their child and of themselves as caregivers<br>– Emotional availability in observed interactions |
| 10. Rose et al., 2018 | 9 carers of children in daycare; South Africa | Cohort study | Not applicable | – Self-efficacy | |

TAU = Treatment as usual.

There are also two published case studies of COS-P (Kim et al., 2018; Pazzagli et al., 2014).

[1] Outcomes are related to the parent unless child is stated.

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### THE CURRENT STUDY OF COS-P

Drawing on this past research, the purpose of the current study was to replicate and extend previous evaluations of the COS-P program. In particular, in this independent randomized controlled trial, we replicated past research by measuring many of the outcomes of COS-P that were expected to improve in previous studies, including child behavior, parenting practices, caregiver stress, caregiver mental health, and caregiver reflective functioning. In addition, these and other measures selected were linked to specific goals of COS-P. These goals include teaching caregivers attachment concepts as a way to (1) encourage reflection on personal attachment patterns and identifying ways to manage relationship expectations and needs (measured here as caregiver stress, caregiver mental health, and caregiver personal anxious and avoidant attachment patterns) and (2) assist parents to understand their children's emotions and needs and respond more sensitively to their children's cues (measured here as parenting practices and reflective functioning). In addition, we measured children's behaviors and symptoms as they are the core reasons that caregivers seek parenting services and support. We extended past research by (1) focusing on multiproblem families who reported both parenting problems and child behavior problems, and (2) conducting COS-P individually with caregivers to provide a service more tailored to each parent (e.g., slowing down presentation of material, answering more questions, taking time for reflection). It was expected that COS-P would: (1) reduce caregiver reports of child behavior problems and their own negative parenting practices (e.g., rejection, coercion), stress related to caregiving, and caregivers' depressive symptoms and anxious and avoidant attachment, and (2) improve positive parenting practices and caregivers' reflective functioning.

## Method

### PARTICIPANTS

The 85 participants were caregivers (85.3% female, $M_{age}$ = 35.00, $SD$ = 8.13) of at least one child aged 1 to 7 years (range 13 months to 7.9 years; $M_{age}$ = 3.45, $SD$ = 1.61; 52.9% male). Caregivers were referred for COS-P, provided at a psychology clinic located at a university in Australia. Most caregivers were biological mothers (82%) or fathers (15%), with three caregivers who were aunts or grandmothers. Caregivers were referred by statutory child protection agencies (22%), other professionals who assessed the family to be at risk of child safety involvement because of parenting problems and child disruptive behavior (e.g., pediatrician, child health nurse, psychologist; 30%), or self-referred due to concerning child behavior problems and high parental distress (48%). The only inclusion or exclusion criteria were that caregivers were referred because of parenting distress and a report of significant child disruptive behaviors (e.g., chronic tantrums, anger, school refusal), the child was between the ages of 1 and 7 years of age, and the caregiver could attend the psychology clinic. COS-P was provided at no cost to the caregivers. Five families were affected by one short COVID-19 clinic closure (our region has had few cases of COVID-19 and had only one short period of stay-at-home orders), but sessions and supervision were continued weekly using tele-health.

Regarding partner status, 66% of caregivers were married or living with a partner, 16% divorced/separated, 9% widowed, and 9% single and never been married (for comparison 2016 census of the region: 47% married, 15% divorced/separated, 5% widowed, 35% single and never been married). Most caregivers were born in Australia (68%), and others were born in one of 16 other countries. Seven percent were First Nation Peoples (for comparison, 2016 census of the region: 64% of adults born in Australia, 1.7% First Peoples or Pacific Islander). A minority (29%) of caregivers were employed, with 33% working in the home, 14% looking for work, 9% self-employed, 8% students, and 7% unable to work or reporting other (for comparison 2016 census of the region: 56% full-time work, 33% part-time work, 4.5% away from work, and 7% unemployed). The average years of formal schooling reported was 13.2 ($SD$ = 3.7) (for comparison 2016 census of the region: 17% university degree, 29% advanced diploma or training, 22% did not graduate from high school). Caregivers reported their earnings per year as less than A$25,000 (30%), between A$25,000 and A$50,000 (18%), between A$50,000 and A$90,000 (20%), between A$90,000 and A$110,000 (18%), and over A $110,000 (14%) (for comparison 2016 census of the region: 19% reported an income of less than AUD$34,000 per year; 14% reported an income of more than AUD$156,000 per year).

### PROCEDURE

#### *Data Collection*

The study was approved by the Griffith University Human Research Ethics Committee (Reference number PSY/10/14/HREC). Caregivers completed the pre-assessment survey online prior to random allocation (physically drawn from a locked box

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by the data manager or their delegate) to either an 8-week COS-P treatment condition ($n$ = 51) or an 8-week monitored waitlist control group ($n$ = 34) (see Figure 1 for a flow diagram). At the completion of either COS-P or monitored waitlist, caregivers completed a second survey. Survey collection and follow-ups were managed by a research assistant who did not provide services to families and was blind to condition. Of the 51 families allocated to the COS-P condition, 42 (82%) completed all 8 sessions of the program and 36 (71%) completed the posttreatment survey. Of the families allocated to the waitlist, 26 (76%) completed both the pre- and post-waitlist survey, but 1 of these 26 caregivers completed only a portion of the post-waitlist survey, resulting in a waitlist sample size of $n$ = 25 or $n$ = 26 for analyses of complete data. The those in the waitlist condition were offered COS-P at the end of the waitlist period; these data were not included in this study. Data collection began in 2017 and continued through 2020.

*Treatment*

Using a suite of attachment-based training materials, COS-P is designed to assist caregivers to reflect on their parenting and their own attachment styles to better understand their children's needs, and to respond appropriately to those needs with love and care while providing a secure base for children's exploration of the environment. Each of the eight sessions explores a parenting challenge, with the therapist supporting the caregivers in reflection and learning. In this study, the program was provided to each caregiver individually, in weekly 1-hour sessions in the university's psychology clinic treatment rooms. Caregivers were asked to complete homework tasks, in the form of parenting reflections.

*Waitlist*

Caregivers assigned to the waitlist condition were contacted via telephone once per week for a brief emotional well-being check-in and an update about time remaining on the waitlist. During the call, the caregiver was asked about their personal health and whether their circumstances as a family had changed. Phone calls were kept brief (usually less than 5 minutes) and were conducted by research program staff who had been trained in COS-P.

*Training and Treatment Integrity*

Seven providers delivered the COS-P program. All COS-P providers had completed the formal COS-P training and five were also registered or provisionally registered clinical psychologists. COS-P providers attended weekly individual supervision provided by a registered clinical psychologist, which was a requirement of the clinical service and attended by all providers except in rare circumstances (e.g., illness, holiday).

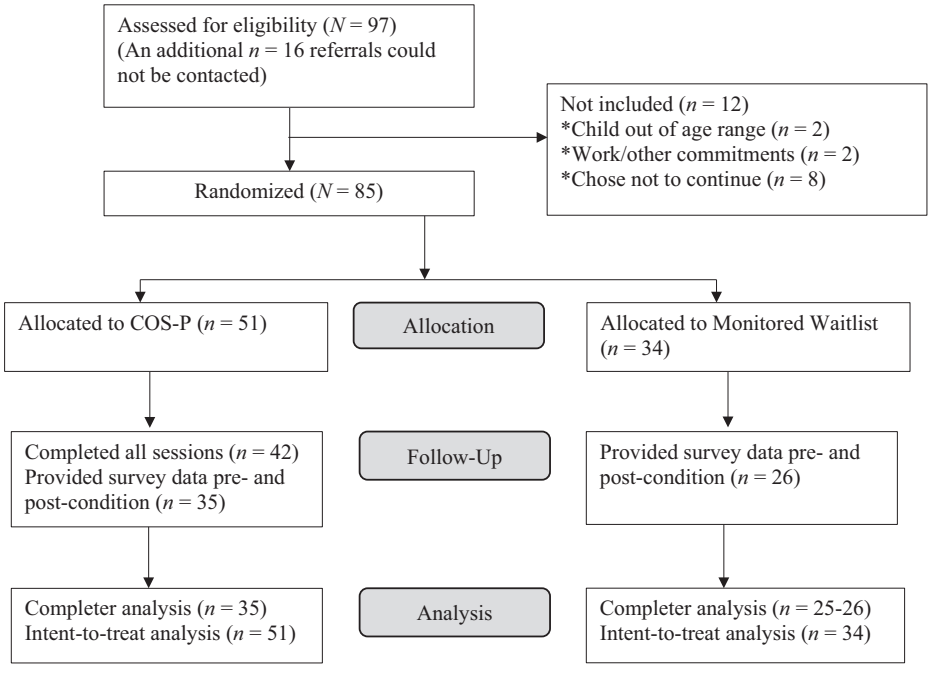


**FIGURE 1** Flowchart of study enrollment, assess, and analysis sample sizes.

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## MEASURES

### *Child Behavior*

The Behavioral Assessment System for Children, 2nd edition (BASC-2; Reynolds & Kamphaus, 2004) is a widely used and clinically validated 134-item multi-dimensional scale, measuring adaptive and maladaptive aspects of child behavior. In the present study, the externalizing (Cronbach's α = .91) and internalizing (Cronbach's α = .89) symptom composite scores were used. Responses ranged from 1 (*never*) to 4 (*almost always*). Relevant items were summed to form subscale composites for hyperactivity, aggression, depression, somatization and anxiety, which were then summed to produce total externalizing behavior and internalizing symptom scores. Of the 82 children, 40% had a score above the clinical cut-off for hyperactivity, 28% had a score above the clinical cut-off for aggression, 21% had a score above the clinical cut-off for anxiety, and 37% had a score above the clinical cut-off for depression.

### *Parenting Practices*

Caregiver parenting practices were measured with the 27-item Parenting Practices Measure (Zimmer-Gembeck et al., 2015). This scale consists of 15 items that measure positive parenting practices that imply warmth, autonomy, support and structure/consistency (*I can always find time for my child*; Cronbach's α = .81), and 12 items that measure negative parenting practices of rejection, coercion, and chaos/inconsistency (*To get my child to do something, I have to yell at them*; Cronbach's α = .85). Responses ranged from 1 (*not at all true*) to 4 (*very true*). Items were averaged to produce composite positive and negative parenting scores, with higher scores indicating more positive or negative parenting.

### *Parenting Stress*

The Parenting Stress Inventory–Short Form (PSI-SF; Abidin, 1995) measured the level of stress from the caregiving role. The PSI-SF has three subscales of 12 items each; parental distress (*I feel alone and without friends*; Cronbach's α = .84,), parent-child dysfunctional interaction (*I expected to have closer and warmer feelings for my child than I do and this bothers me*; Cronbach's α = .88) and difficult child (*My child seems to cry and fuss more often than most children*; Cronbach's α = .94). Responses ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). Composite subscale scores were formed by averaging relevant items, and a total parenting stress composite was formed by averaging the three subscale, α = .96.

### *Caregiver Depression*

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) was used to assess caregiver depressive symptomology. Respondents were instructed to indicate how they had felt in the previous 2 weeks on 21 items, tapping aspects of depression such as pessimism, loss of appetite, and worthlessness. Response options ranged from 0 to 3 (e.g., Sadness: 0 = *I did not feel sad*, 3 = *I felt so sad or unhappy that I couldn't stand it*) with an overall score obtained by summing the items; Cronbach's alpha was .93. Most caregivers reported minimal (32%) or mild (25%) symptoms of depression, with 33% moderately high and 10% very high in depressive symptoms.

### *Caregiver Reflective Functioning*

Caregivers' ability to reflect on their own, and their child's, internal mental experiences was measured with the 39-item Parental Reflective Functioning Questionnaire (PRFQ; Luyten et al., 2017). The PRFQ uses response options from 1 (*strongly disagree*) to 7 (*strongly agree*). Items were averaged to calculate totals on three subscales: prementalizing (6 items, *Often my child's behaviour is too confusing to figure out*; Cronbach's α = .74), certainty about child mental states (6 items, *I always know why my child acts the way he/she does*; Cronbach's α = .76), and interest and curiosity in the child (6 items, *I try to see situations through the eyes of my child*; Cronbach's α = .80).

### *Caregiver Attachment Anxiety and Avoidance*

Caregivers' attachment anxiety and avoidance were measured with the 36-item Experiences in Close Relationships scale (ECR; Brennan et al., 1998). Caregivers rated the extent to which each ECR item describes how they feel in close relationships (*I'm afraid that I will lose my partner's love*) with responses from 1 (*strongly disagree*) to 7 (*strongly agree*). Attachment anxiety (Cronbach's α = .91) and avoidance scores (Cronbach's α = .91) were formed by averaging the relevant items.

## OVERVIEW OF ANALYSES

Prior to examining attrition rates and outcomes of COS-P relative to waitlist, descriptive statistics (e.g., means and standard deviations) for all measures were examined, and independent groups t-tests and $\chi^2$ tests were used to compare baseline characteristics of participants in the COS-P relative to the waitlist conditions. Next, to examine treatment outcomes between the two conditions, 2 (Condition: COS-P, monitored waitlist) × 2 (Time: pre-assessment vs. post-assessment) mixed factorial ANOVAs were used. In these analyses, we had power to detect an effect size for the inter-

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action (condition × time) of .20 with 85% power, assuming a correlation of repeated measures of $r$ = .50. To account for experiment-wise error-rate, the $p$-value was adjusted to .005 (i.e., .05/11 outcome measures). However, for comparison to previous research, we provide all effect sizes and also address findings with a $p < .05$. We note when findings did not meet the $p < .005$ criterion.

Of the 85 participants, 37 participants had missed a small number of items on the pre-test survey (30 participants missed 1 or 2 items, 7 participants missed 3 to 9 items). According to Little's MCAR test (Little, 1998), this missingness was completely at random. Thus, composite pre-test scores were formed by averaging or summing completed items (adjusting scores when composites were sum scores, namely for caregiver depression, child externalizing behavior and child internalizing symptoms). Of the 61 participants who returned the post-test, 1 participant completed measures of child symptoms and parenting stress only, resulting in a sample size of 60 or 61 for analyses of complete data (see Figure 1). In addition, we conducted intent-to-treat analyses using multiple imputation (20 imputations) to estimate missing outcome data for the 24 participants who did not return the post-test (Graham, 2009; Gupta, 2011; Shechner et al., 2014). This sensitivity analysis included all 85 participants. In these analyses we had power to detect a small effect size (.20) for the interaction (Condition × Time) with 95% power, assuming a correlation between repeated measures of $r$ = .50. Given that $r$ for repeated measures tended to be higher than expected (approximately $r$ = .75), actual power to detect a small effect size (.20) for the interaction (Condition × Time) was 99%.

## Results

### MEANS, STANDARD DEVIATIONS, AND CONDITION DIFFERENCES AT PRE-ASSESSMENT

Child age, parent age, and parent education level did not differ between treatment and waitlist conditions. There was also no condition difference in the proportion of children who were male vs. female, and no condition differences in parent employment status, income, or marital status. There was no significant difference in referral source (i.e., child protection authorities, self-referred and other – e.g., GPs, psychologists) between conditions. Finally, there were no differences at pre-assessment on any outcome measure (see Table 2).

### COS-P TREATMENT VS. WAITLIST OUTCOMES

#### *Complete Data*

As shown in Table 3, there were two Condition × Time interactions with $p < .05$, showing that COS-P was associated with a decline in negative parenting practices and caregiver attachment anxiety. However, when the $p$-value is adjusted for experiment-wise error rate, only the interaction in the model of caregiver attachment anxiety met the criterion of $p < .005$. For other measures (i.e., children's externalizing and internalizing symptoms, and caregiver stress, reflective functioning, positive parenting practices, attachment avoidance or depressive symptoms), there was no evidence that COS-P led to improvements relative to parents on the monitored waitlist (although the effect of COS-P on children's externalizing behavior was marginal, $p$ = .059). There were time effects, showing significant improvements across

Table 2
Means and Standard Deviations at Pretest and *t*-tests Comparing COS-P ($n$ = 51) to Waitlist ($n$ = 34) Conditions at Pretest

| Outcome Measure | COS-P Pre *M (SD)* | Waitlist Pre *M (SD)* | Pre Comparison *t*(1,83), *p* | Cohen's *D* |
|---|---|---|---|---|
| Child externalizing behavior | 21.25 (11.57) | 19.44 (9.37) | −0.76, .448 | 0.17 |
| Child internalizing behavior | 24.37 (11.34) | 29.15 (12.87) | 1.80, .075 | 0.39 |
| Caregiver stress total | 2.29 (0.74) | 2.37 (0.80) | 0.49, .629 | 0.10 |
| Caregiver RF: Prementalizing | 2.01 (.83) | 2.05 (1.08) | 0.21, .836 | 0.04 |
| Caregiver RF: Certainty of child mental states | 3.87 (1.07) | 3.66 (1.12) | −0.85, .395 | 0.19 |
| Caregiver RF: Interest in the child | 5.59 (1.07) | 5.70 (0.98) | 0.49, .624 | 0.11 |
| Positive parenting practices | 3.30 (0.37) | 3.28 (0.37) | −0.26, .794 | 0.05 |
| Negative parenting practices | 1.83 (0.60) | 1.79 (0.58) | −0.36, .720 | 0.09 |
| Caregiver Attachment anxiety^ | 2.92 (1.32) | 2.57 (1.09) | −1.29, .202 | 0.29 |
| Caregiver Attachment avoidance^ | 2.73 (1.40) | 2.60 (1.28) | −0.45, .658 | 0.10 |
| Caregiver Depressive symptoms | 12.84 (11.18) | 12.62 (10.03) | −0.10, .925 | 0.02 |

*Note.* RF = reflective functioning. ^COS-P $n$ = 50, waitlist $n$ = 34. df = 1,82.

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Table 3
Comparing Change from Pre- to Post- Between COS-P ($n$ = 35) and Waitlist ($n$ = 26) Conditions

| Outcome Measure | COS-P Pre $M$ ($SD$) | COS-P Post $M$ ($SD$) | Wait Pre $M$ ($SD$) | Wait Post $M$ ($SD$) | Cond $F$(1,59) (eta$^2$) | Time $F$(1,59) (eta$^2$) | Time × Cond $F$(1,59) (eta$^2$) |
|---|---|---|---|---|---|---|---|
| Externalizing behavior | 22.63 (12.01) | 19.54 (10.33) | 19.00 (9.02) | 18.81 (10.16) | 0.69 (.01) | 4.78* (.08) | 3.72^ (.06) |
| Internalizing symptoms | 24.96 (11.13) | 23.23 (11.68) | 27.88 (12.01) | 25.27 (13.13) | 0.77 (.01) | 3.77* (.06) | 0.20 (.00) |
| CG stress total | 2.27 (0.77) | 2.01 (0.60) | 2.43 (0.71) | 2.27 (0.77) | 1.36 (.02) | 17.02*** (.22) | 1.11 (.02) |
| CG RF: Prementalizing^^ | 1.93 (.71) | 1.86 (.82) | 1.99 (0.69) | 1.87 (0.80) | 0.05 (.00) | 1.09 (.02) | 0.07 (.00) |
| CG RF: CM states^^ | 3.92 (.94) | 4.15 (1.04) | 3.57 (0.97) | 3.66 (1.11) | 3.22 (.05) | 1.74 (.03) | 0.32 (.01) |
| CG RF: Interest child^^ | 5.60 (.91) | 5.96 (.85) | 5.81 (0.80) | 6.03 (0.85) | 0.49 (.01) | 7.29** (.11) | 0.41 (.01) |
| Positive parenting^^ | 3.33 (.37) | 3.40 (.44) | 3.31 (0.38) | 3.35 (0.39) | 0.13 (.00) | 1.72 (.03) | 0.11 (.00) |
| Negative parenting^^ | 1.84 (.46) | 1.68 (.36) | 1.81 (0.50) | 1.84 (0.53) | 0.37 (.01) | 2.77 (.05) | 6.11* (.10) |
| CG Attach anxiety^^ | 2.81 (1.21) | 2.39 (1.20) | 2.67 (1.09) | 2.95 (1.32) | 0.49 (.01) | 0.46 (.01) | 10.87** (.16) |
| CG Attach avoidance^^ | 2.54 (1.26) | 2.58 (1.31) | 2.59 (1.19) | 2.97 (1.13) | 0.55 (.01) | 2.35 (.04) | 1.50 (.03) |
| CG Depressive symp^^ | 11.49 (11.29) | 8.31 (9.62) | 12.84 (10.05) | 12.68 (10.37) | 1.29 (.02) | 2.66 (.04) | 2.17 (.04) |

*$p$ < .05. **$p$ < .01. ***$p$ < .001. ^$p$= .059. ^^COS-P $n$ = 35, Waitlist $n$ = 25, df = 58.
*Note*. Cond = condition. RF = reflective functioning. CM = certainty of child mental. Attach = attachment. Symp = symptoms.

both conditions in child externalizing and internalizing symptoms, caregiver stress, and caregivers' interest in the child.

*Intent-to-Treat Data: Multiple Imputation*

As shown in Table 4, only one of the two Condition × Time interactions, namely for caregiver attachment anxiety, was significant in the intent-to-treat analyses based on using multiple imputation to replace missing post-assessment data. There were many time effects, showing significant improvements across conditions in children's externalizing and internalizing symptoms, and caregiver stress, certainty of children's mental states, interest in the child, and depressive symptoms.

## Discussion

We conducted a randomized controlled trial to investigate the effect of caregivers' participation in COS-P, an 8-week psychoeducational attachment-based program, on children's externalizing and internalizing symptoms (i.e., hyperactivity and aggressive behavior, depressive and anxious symptoms), and caregivers' parenting practices, parental stress, reflective functioning, anxious and avoidant attachment, and depressive symptoms, relative to a monitored waitlist condition. Prior to this study, the results of only two randomized controlled trials (RCTs) of COS-P had been disseminated (Cassidy, Brett, et al., 2017; Risholm Mothander et al., 2018), making this only the third RCT conducted. These previous RCTs identified few significant improvements among families following COS-P compared to waitlist (Cassidy, Brett, et al., 2017) and no differences between treatment-as-usual enhanced with COS-P relative to treatment-as-usual (Risholm Mothander et al., 2018). In addition, prior research evaluating the effectiveness of COS-P was extended here by implementing the program with families reporting both parenting and child disruptive behavior and using an individualized format with each at-risk caregiver. In intent-to-treat analyses, generally consistent with the generally null findings of past RCTs, COS-P was associated with only 1 of 11 outcome measures—caregiver attachment anxiety. Yet, when analyses were limited to only those who completed pre- and post-assessments, COS-P had two small effects—COS-P reduced caregivers' own attachment anxiety and self-reported negative parenting practices (e.g., rejection and coercion).

To the best of our knowledge, this is the first COS-P evaluation to find significant improvement in caregiver attachment anxiety. Research indi-

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Table 4
Results of Intent to Treatment Analyses Using Multiple Imputation: Comparing Change from Pre- to Post- Between COS-P ($n$ = 51) and Waitlist ($n$ = 34) Conditions

| Outcome Measure | COS-P Pre $M$ ($SD$) | COS-P Post $M$ ($SD$) | Wait Pre $M$ ($SD$) | Wait Post $M$ ($SD$) | Cond $F$(1,83) (eta$^2$) | Time $F$(1,83) (eta$^2$) | Time × Cond $F$(1,83) (eta$^2$) |
|---|---|---|---|---|---|---|---|
| Externalizing behavior | 21.25 (11.57) | 18.84 (10.39) | 19.44 (9.37) | 18.41 (10.32) | 0.27 (.00) | 6.61* (.07) | 1.28 (.02) |
| Internalizing symptoms | 24.37 (11.34) | 23.05 (12.89) | 29.15 (12.87) | 26.35 (14.00) | 2.44 (.03) | 4.63* (.05) | 0.69 (.01) |
| CG stress total | 2.29 (0.74) | 2.04 (0.69) | 2.37 (0.80) | 2.22 (0.83) | 0.70 (.01) | 18.56*** (.18) | 1.43 (.02) |
| CG RF: Prementalizing | 2.01 (0.83) | 1.90 (0.89) | 2.05 (1.08) | 1.95 (0.88) | 0.00 (.00) | 1.60 (.02) | 0.21 (.00) |
| CG RF: CM states | 3.87 (1.07) | 4.13 (1.26) | 3.63 (1.15) | 3.93 (1.43) | 0.88 (.01) | 4.56* (.05) | 0.42 (.00) |
| CG RF: Interest in child | 5.59 (1.07) | 5.96 (1.00) | 5.70 (0.98) | 5.92 (1.14) | 0.13 (.00) | 6.73* (.07) | 0.71 (.01) |
| Positive parenting | 3.30 (0.37) | 3.37 (0.47) | 3.28 (0.37) | 3.32 (0.47) | 0.28 (.00) | 1.84 (.02) | 0.42 (.01) |
| Negative parenting | 1.83 (0.60) | 1.71 (0.47) | 1.79 (0.58) | 1.80 (0.61) | 0.08 (.00) | 2.64 (.03) | 3.24 (.04) |
| CG Attach anxiety | 2.92 (1.32) | 2.58 (1.53) | 2.57 (1.09) | 2.75 (1.55) | 0.18 (.00) | 0.97 (.01) | 4.62* (.05) |
| CG Attach avoidance | 2.73 (1.40) | 2.75 (1.48) | 2.57 (1.28) | 2.94 (1.31) | 0.06 (.00) | 2.02 (.02) | 1.51 (.02) |
| CG Depressive symp | 12.84 (11.18) | 9.64 (12.00) | 12.62 (10.03) | 11.23 (12.15) | 0.19 (.00) | 4.96* (.06) | 1.30 (.02) |

*$p$ < .05. **$p$ < .01. ***$p$ < .001.
*Note.* Cond = condition. RF = reflective functioning. CM = certainty of child mental. Attach = attachment. Symp = symptoms.

cates that individuals high in attachment anxiety are more vigilant for signs of abandonment from close others (Daly & Mallinckrodt, 2009), fixated on attachment concerns (Slade, 2016), and score lower on psychological flexibility (Salande & Hawkins, 2017). Thus, delivery of COS-P via individual sessions with caregivers in the present study may have been able to provide interactions that gently, but personally, challenged individual caregivers, allowing them to reconsider their own anxieties about safety and security in relationships. Given that the largest trial of COS-P to date found no effect of COS-P on mothers' attachment styles when it was delivered in a group format, we suspect the effect on anxious attachment may have occurred because of the individualized format of COS-P sessions. Individual sessions could have allowed caregivers more time to reflect personally on the content. This personal reflection time might have helped to solidify understanding about the importance of safety and security as core to close relationships and wellbeing for the entire family. Another research study indicated that metaphors and attributing a healthy meaning to past experiences can be effective strategies implemented by experienced therapists to reduce adults' attachment anxiety (Daly & Mallinckrodt, 2009). Education using the COS-P graphic and caregivers' reflection of their past experiences during individual sessions are techniques that align with this approach.

One other improvement was also found among participants in COS-P relative to waitlist. Analyses conducted with completer data (but not with intent-to-treat data) indicated COS-P led to reductions in caregiver-reported negative parenting practices. The reduction in negative parenting practices was small but was consistent with a previous nonrandomized study that found COS-P was associated with improvements in parental discipline practices (i.e., laxness and overreactivity; Horton & Murray, 2015) and with a larger nonrandomized study that found COS-P was related to a decline in hostility toward the child (Maxwell et al., 2021). Thus, COS-P could help parents avoid overtly hostile behaviors when interacting with their young children.

Across all of our analyses comparing outcomes of COS-P to monitored waitlist, there were numerous significant time main effects. These time effects showed that both the COS-P and the waitlist conditions improved over time. More specifically, we found small declines in caregiver-reported child externalizing and internalizing symptoms, a somewhat larger (but still small) decline in caregiver stress, and a small increase in interest in the child.

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Other time effects were also found but they were limited to the analyses of those completing the post-assessment. Thus, many improvements were reported by caregivers, but these improvements were not able to be attributed to COS-P specifically, emphasizing the importance of having a randomized waitlist control condition in future research.

To date, the characteristics of caregivers (e.g., family childcare workers, parents with substance use dependence), delivery formats (e.g., individualized or small groups), and measures to assess outcomes have varied across studies of the efficacy or effectiveness of COS. Across these studies, there have been mixed findings regarding whether COS-P achieves its aims for parents and children. The same was found in the present study, whereby there was some improvement for caregivers, on average, in their own anxious attachment and COS-P led to a reduction in negative parenting practices (e.g., rejection and coercion in parent-child interactions). Yet, these improvements were small and one improvement (negative parenting) was not significant when all participants were maintained in the intent-to-treat analyses using multiple imputation. Further, many of the null findings here aligned with past research. For instance, in one previous randomized controlled trial of COS-P, Cassidy, Brett, et al. (2017) reported that COS-P did not improve child internalizing symptoms (e.g., anxiety) or externalizing behaviors (e.g., disruptive or aggressive behavior). Further, COS-P participation did not result in improvements in depressive symptoms or reflective functioning in other comparison or cohort studies (Gray, 2015; Kohlhoff et al., 2016; Maupin et al., 2017). The most promising findings to date come from a large study of group-delivered COS-P compared to a nonrandomized waitlist control group, with improvements in caregivers' empathy and declines in caregivers' feelings of helplessness as a parent, hostility toward the child and depressive symptoms attributed to COS-P participation (Maxwell et al., 2021). However, it is notable to highlight that the most consistent positive correlate of COS-P seems to be parents' increased feelings of agency and efficacy (Gray, 2015; Kohlhoff et al., 2016; Maxwell et al., 2021; Rose et al., 2018; see Table 1), which is a positive outcome, but it may or may not be related to change in behavior, child well-being, or parent-child relationships.

Given the numerous null findings of group-delivered COS-P in past research and the many null findings for individually delivered COS-P here, it seems that one next step is to consider how to boost COS-P effectiveness. Although individual and group formats have not yet been directly compared, it does *not* appear that providing COS-P on an individual basis in this study resulted in more benefits to parents than have been found when using group-format COS-P. Instead, one possibility for improvement is providing components found to be directly related to positive parenting and child outcomes (Kaminski et al., 2008). These could be specific opportunities for direct feedback on parenting in conjunction with COS-P sessions, either through add-on modules or as a stepped-up approach when COS-P psychoeducation does not have the intended effects. For example, Gray (2015) postulated that feedback about observed personal parenting practices may be needed to increase caregivers' reflections on personal behavior and to encourage greater understanding of (and empathy for) children's mental states. Supporting this view, one randomized controlled trial of a home-based, video-feedback program of caregiver-child interactions reported improvements in related key outcomes such as caregiver sensitivity and child attachment, but did not measure reflective functioning (Moss et al., 2011). In addition, Parent-Child Interaction Therapy, which involves education, in-vivo practice, and immediate feedback and guidance on parent-child interactions, has been found to improve child externalizing behavior and numerous parenting outcomes with moderate or larger effects in at-risk families (Thomas et al., 2017; Zimmer-Gembeck et al., 2019). All of these programs depend on sufficient individual time for a single family and often also involve children in the sessions.

Nevertheless, since COS-P has weak evidence of effectiveness, a second consideration is whether other programs might be a preferred choice, especially when providing individualized services to at-risk families. For example, if attachment-based programs are desirable, there are other programs available that have established efficacy (e.g., Child-Parent Psychotherapy; see Berlin et al., 2016; Cicchetti et al., 2006). In addition, when working with at-risk families, such as those with a history of child maltreatment or family/domestic violence, there is evidence that intensive parenting programs, such as Parent-Child Interaction Therapy, can be effective for improving observed sensitivity to the child, reducing self-reported rejecting, coercive or hostile parenting practices and stress, decreasing children's disruptive behaviors and symptoms of depression or anxiety, and even reducing the risk of notifications for suspected abuse in the future (Chaffin et al., 2004; Thomas

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& Zimmer-Gembeck, 2011, 2012). Individualized, intensive interventions that involve directly observing parents with their children and providing opportunities for concrete application of psychoeducational content and new skills seem especially worthwhile for all parents (see Kaminski et al., 2008), but may be especially important when working with parents who have a history of child neglect or abuse or domestic violence.

Future research should certainly continue the emerging focus on whether integrating unique components of COS-P with elements of other parenting programs could yield even more benefits for parents and children. Indeed, a recent study (Huber et al., 2020) integrated COS-P material into the protocol of the Circle of Security Intensive Intervention (COS-I) to form a hybrid COS protocol (i.e., COS-I-RH). The intensive protocol allowed for caregivers' observations and reflections of their own caregiver-child interaction videos. Parents attended COS-I-RH for approximately 20 weeks, in either individual or group formats. At posttreatment, parents reported significant improvements in supportive responding to child distress and parenting self-efficacy, regardless of individual or group attendance. Positive outcomes of COS-I have been reported, including improvements in maternal sensitivity (i.e., in mothers with unresolved attachment; Ramsauer et al., 2020), child attachment (Cassidy et al., 2010; Hoffman et al., 2006; Huber et al., 2015b), child behavioral problems (Huber et al., 2015a), and parent reflective functioning (Huber et al., 2015b). COS-I is also associated with reductions in parenting stress (Huber et al., 2016) and disorganization (Cassidy et al., 2010; Hoffman et al., 2006; Huber et al., 2015b).

## STUDY STRENGTHS AND LIMITATIONS, AND FUTURE RESEARCH

The current study has many strengths. One strength is that COS-P was provided to parents referred from a range of sources, including child welfare and intensive child developmental services, because of parenting lapses and stress combined with child behavior problems. This sampling allows for generalizability of the findings to Australian parents facing multiple challenges. Second, COS-P was provided using an individualized format, which allowed for more personalized attention and privacy for discussing sensitive topics, especially when parents had experienced family violence or have been referred to child welfare for child maltreatment. Third, this study has methodological strengths, including the use of randomization and a waitlist control condition, and the inclusion of several widely used, valid measures of parenting and child outcomes. Finally, although our region of Australia had few interruptions from COVD-19 (few cases and only one short period of stay-at-home orders and clinic closure), five families were affected by the disruption. However, COS-P was quite easily shifted to a telehealth format so services could be continued.

Despite the above strengths, the current study also has limitations. First, all outcome measures were reported by caregivers, which could be subject to social desirability bias. Yet, self-report measures are the most likely to show positive benefits and larger effect sizes, suggesting that null effects are least likely when self-report is used (Thomas & Zimmer-Gembeck, 2007). Thus, we do not anticipate that significant improvements were not found because of the use of self-report only. Further to this, caregivers were aware of their treatment allocation, which could introduce bias in responding to self-report measures based on caregiver expectation. However, it is notable that improvements were found in both the treatment and waitlist groups. Second, COS-P was compared to a monitored waitlist, rather than other parenting programs, and therefore, the positive effects found may not be attributed specifically to COS-P content (Cassidy, Brett, et al., 2017). These findings could be suggesting the presence of a general factor (such as social support or attention from a service) may have been the mechanism responsibility for improvements, given that multiple improvements over time were found in both the COS-P and the monitored waitlist conditions. Third, we utilized a relatively new measure of reflective functioning that has not been widely used in prior research. Future research is needed to better validate this measure (see also Zimmer-Gembeck et al., 2019). Fourth, the sample size was modest, but calculated power indicated sufficient ability to detect even small effect sizes, and methods were used to estimate missing data to maintain all participants in intent-to-treat analyses.

## CONCLUSION

The current study extends existing evidence (Cassidy, Brett, et al., 2017; Gray, 2015; Horton & Murray, 2015; Krishnamoorthy et al., 2020; Kohlhoff et al., 2016; Maxwell et al., 2021; Rose et al., 2018) that is converging on the conclusion that there is somewhat mixed evidence for the efficacy and effectiveness of COS-P, an 8-week psychoeducational program for caregivers of young children. In the present study, COS-P, relative to a monitored waitlist condition, was effective at

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improving caregiver attachment anxiety, and, in analyses of those who completed all assessments, also reducing caregiver-reported negative parenting practices. However, the COS-P effects found were small and COS-P had no significant effect on multiple other measures including child externalizing and internalizing symptoms, caregiver reflective functioning, attachment avoidance, positive parenting practices, parental stress, and caregiver depression. Given these findings, we conclude that COS-P should be considered a program to implement when the aim is to gently introduce parents to a parenting intervention and to attachment concepts of security and safety. This might be a useful first step for some parents before they step-up to additional programs that have larger effects on improving parenting skills and young children's behavior and well-being.

## Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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