

Original Research

Emotional Availability (EA) Brief: Single Session Feedback and Coaching for Improving Fathers' Emotional Availability for Children Across a Wide Developmental Spectrum

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doi:10.21926/obm.icm.2303032**Received:** May 12, 2023**Accepted:** July 09, 2023**Published:** July 27, 2023**Abstract**

Fathers are a historically underrepresented population in developmental research and must be considered for their modern presentation in parenting processes. Emotional Availability (EA) is a construct that captures the parent-child relationship quality and predicts positive outcomes for children. A recently developed intervention, the EA Brief, is a program conceptualized for easy administration that may be utilized to improve father-child dyadic functioning across a range of child ages. The final sample of interested fathers was 18 fathers with children between 4-months and 13.5-years. For pretest sessions, all fathers completed surveys (demographic information, the Emotional Availability Self Report, and the Flourishing Scale) via Qualtrics, followed by a 20-minute filmed interaction via Zoom which was later coded for EA. Immediate Intervention Group (IIG) received one pretest before the intervention and one posttest after the intervention over a 3-5 week intervention delivery.



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The intervention involved a 2-hour interactive Zoom workshop where information about EA, attachment, and mindfulness was provided, a 1-hour individualized, Zoom EA feedback/coaching session, and two weeks of text reminders about the covered content. In contrast to the IIG, the Waitlist Control (WC) participants received two pretests (same assessments as above) separated by the 3-5 week time period corresponding to the timing of intervention delivery for the IIG. After the second pretest, they received the same intervention as the IIG. All IIG and WC fathers received posttest sessions (exact same assessments as for the pretests noted above). Across 16 target variables assessing EA, six observed variables showed post-intervention improvement ($\alpha < 0.05$) though no significant findings were found on self-reported measures. These findings suggest that fathers respond to programs that provide guidance for clinically informed, research-based parenting despite the program having limited effect on their self-perceptions of how they parent.

Keywords

Fathers; emotional; availability; intervention

1. Introduction

Due largely to increasing maternal employment over time, fatherhood has evolved over the last half century such that fathers' roles primarily as husbands and financial providers has shifted to include more involvement in childcare [1, 2]. Generally, fathers play a role in desirable child outcomes across different developmental domains, including cognitive [3-5], language [6], social [7], and emotional development [8]. Given fathers' relative underrepresentation in research [9, 10], more focus on fathers merits consideration.

Fathering, when considered a predictor of child outcomes, is frequently operationalized as paternal involvement [11, 12]. Paternal involvement requires additional dissection as it is comprised of three separate components: engagement (direct interaction with the child), accessibility (availability to the child), and responsibility (being accountable for the child's general well-being; [13]). More recent conceptualizations of involvement have shifted focus to include positive engagement as well as warmth and responsiveness [14], but the empirical emphasis remains on frequency- or duration-based interactivity [12].

However, evidence in the literature often points to child outcomes being associated with characteristics of fathers' interactive style. For example, Meuwissen and Carlson [5] found that children with fathers who exhibited more autonomy support in a collaborative puzzle task displayed better executive functioning than children of controlling fathers. Supportive fathering predicts better cognitive outcomes while negative or detached fathering predicts worse cognitive outcomes [6, 15]. Specifically physical play, like rough-and-tumble play (RTP) and which is more typical in father-child interactions, is positively associated with social competence [7]. This reiterates findings from Dumont and Paquette [8] indicating that children's social-emotional development at 30 to 36 months was better predicted by the Risky Situation (RS; a measure of the activation relationship associated more regularly with fathers and characterized by more stimulating, physical play) than by the Strange Situation (SS) attachment measure.

Palkovitz [12] suggests father-child relationship quality (FCRQ) may provide a more holistic lens to accurately assess father-child relationships and relevant outcomes. FCRQ is conceptualized as the interdependence between both children's and fathers' affect, behavior, and cognition. Although the author suggests several extant measures that capture elements of FCRQ, emotional availability (EA) includes similar core components such as affective warmth, attachment, behavioral engagement with the child, and a synchrony and sensitivity to the child's signals [16].

1.1 Emotional Availability

Emotional availability is a construct that explains the quality of interaction between a parent and their child [17]. Seminal work on attachment posits the importance of the parent as a secure base that provides the child with the opportunity for refueling by accurately interpreting the child's signals and sensitively and promptly responding. Furthermore, EA synthesizes concepts of attachment theory with emotions theory [18] and systems theory [19]. Altogether, the EA concept focuses on specific relationship dynamics that play crucial roles in indicating the quality of dyadic interactions and on the importance of emotional signaling (facial, vocal, postural) in such interactions.

EA is comprised of six dimensions: four reflecting parent qualities and two reflecting child qualities [20]. *Sensitivity* refers to the parent's ability to display affect warmly, authentically, and appropriately and to clearly perceive and respond to the child's cues. *Structuring* evaluates how effectively parents guide learning, both by limit-setting and providing scaffolding or support for cognitive tasks. *Nonintrusiveness* is the parent's ability to refrain from interfering behaviors that impede the child's autonomy. *Nonhostility* is the parents' absence of covert or overt negativity—in affect, speech, or behavior—that could communicate discontent. *Child responsiveness* captures the child's affective quality as well as their reactivity to their parent's cues. *Child involvement* is defined as the extent to which the child engages the parent in the collective activity (play, task, dialogue, etc.).

Extensive empirical support indicates that EA (individual scales or as composite variables) predicts a host of outcomes. In a trauma sample, Ziv et al. [21] found higher nonintrusiveness and nonhostility of the mother were positively associated with children's social information processing and social behavior. Findings from another EA study demonstrate that children with highly structuring mothers experienced better cognitive and language outcomes at 30 months [22]. Maternal EA and nonintrusiveness, in particular, were positively associated with performance on several measures of executive functioning in 4-to 6-year-old children [23]. Infants of mothers demonstrating high emotional availability (measured as a maternal composite of the individual scales), both during a daytime and bedtime interactions, had lower cortisol levels at 3 months and more developed circadian patterns in cortisol, representing more mature sleeping rhythms [24]. With fathers, EA at child age 7 months was associated with the attachment of the infant (as measured by the Strange Situation Procedure) at 14-18 months [25].

Because EA shares concepts with attachment theory and predicts attachment security, the Emotional Attachment/Emotional Availability Clinical Screener was developed as a measure of attachment style that considers the individual standpoints of each of the interactive partners. Parents and children can each be classified within a particular EA zone (highly emotionally available, complicated, detached, problematic), unlike other attachment measures that consider a singular

designation for the dyad (secure, resistant/ambivalent, avoidant, disorganized; [26-28]). Using three different samples, Wurster and Biringen [29] found that the EA zones mapped onto secure/insecure on various attachment measures, including the Strange Situation Procedure [27], the Attachment Q-Sort [30], and the Adult Attachment Interview [31].

EA is useful in that it provides a lens to consider the father's style, the child's attachment-based behaviors, and overall dyadic functioning—collectively showing *how* fathers are parenting and how their children behave in turn. Children's responsive and involving behaviors impact the system, potentially reinforcing or discouraging parenting behaviors, and are thus useful measures to consider as well. Using EA as a measure of FCRQ can provide insight into father-child dyads and, subsequently, interventions targeting EA in fathers may demonstrate an ability to improve FCRQ and related outcomes.

Brief interventions have demonstrated positive effects. For example, adaptations of Parent-Child Interaction Therapy (PCIT) that shorten treatment length by implementing group practices, distributing written materials, or eliminating skill mastery requirements to progress through treatment phases demonstrated intervention efficacy [32, 33]. A shortened version of the Incredible Years program decreased harsh discipline and child behavioral problems while increasing positive parenting and parents' sense of competence [34].

1.2 Background for This Intervention

Earlier work was conducted to deliver information about EA, attachment, and mindfulness and reported for in-person [35] and tele-intervention (i.e., Skype) [36] formats across a 4-6 week time frame, with positive mother and child outcomes. Researchers have reported positive outcomes even in cases where as few as one session of coaching was observed [37]. To create an intervention easier to implement due to a shorter total duration and more focused on providing in-the-moment EA feedback to parents, the EA Brief was conceptualized. This brief model, with a focus on using the EA framework for feedback and conversation, was conceptualized as a novel way to “plant a seed” for parents who are either generally functioning well, for those who may not want to commit to a lengthy intervention, and/or for those who are already engaged in a broader intervention and would benefit from specific EA guidance.

McConnell et al. [38] was the initial study to investigate whether this brief, in-person format (a workshop to deliver information and only a single session of feedback/coaching) would be effective. McConnell et al.'s initial testing of the EA Brief ($n = 25$) demonstrated improvements in both reported and observed emotional availability, particularly for the observed child responsiveness and involvement dimensions. While findings suggested potential impact of this in-person program, the study focused on mothers, children 0-3 years, and had no control group. Russell [39] used the same design, measures, and Zoom as the mode of delivery to study mothers with children up to 17 years of age. Study findings indicated positive outcomes both with respect to observational EA, self-reported EA as well as flourishing [39], which spurred interest in understanding whether father-child interactions can be improved via the EA Brief.

1.3 The Current Study

The goal was to extend the model initially studied by McConnell et al. [38] to a wider developmental spectrum (i.e., including dyads with children up to 17 years of age), consider if the

intervention can be delivered effectively via Zoom (as data collection was during the COVID-19 pandemic), and most notably, to see if Russell's [39] work with mothers could be replicated with fathers. This brief intervention model involves providing detailed, moment-to-moment feedback to parents about their EA with their child. To do this effectively, fathers need information about EA and related concepts that are used in the model.

The model principally involves psychoeducation and individualized EA feedback. The psychoeducation involves a single, group-based virtual workshop regarding emotional availability, attachment, and mindfulness. EA feedback entails pausing and replaying clips from specific time points of the filmed pretest video(s) to connect concepts learned from the psychoeducation to what the father notices in his own interactions. From there, the coach guides the father with positive reinforcement or suggestions for scaffolding behavioral and/or affective improvement. Building an understanding of ways to influence EA within father-child dyads could provide an avenue for inviting fathers into more rewarding and developmentally stimulating interactions with their children.

Because evidence suggests that father-child relationships may be different than mother-child relationships, defined by activation (e.g., from rough-and-tumble play; [7, 8, 40]), intervention results from mother participants cannot be assumed to extrapolate to fathers. In fact, extant literature suggests some gender differences in EA across dyad type (mother-daughter, mother-son, father-daughter, father-son; [41]). Additionally, while presentation of improved EA represents better dyadic functioning (observed), fathers' self-efficacy and internalized factors may impact the extent to which fathers engage in caregiving with their children [42], thus a need to consider results of fathers' self-perceptions. The goal of this study was not to compare mothers' to fathers' susceptibility to the intervention but simply to evaluate evidence regarding whether it improves father-child EA.

This study was designed to test two hypotheses. Firstly, (H1) it was expected that the EA Brief would improve paternal-child EA such that statistically significant differences could be detected between fathers' pre- and post-test assessments on observed EA compared to controls. Secondly, (H2) it was expected that the EA Brief would improve father's self-reports of EA and self-reports of well-being (i.e., flourishing) such that statistically significant differences could be detected between fathers' pre- and post-test assessments on their self-perceptions compared to controls.

2. Methods

2.1 Participants

Participants were recruited with listserv emails sent to faculty, student, and staff members of a university in a suburban setting. The email included text and an attached flyer detailing the requirements of participants as well as possible benefits of participating (i.e., free parent coaching that may improve parent-child relationship quality). This convenience sampling procedure solicited interested parties to respond to the principal investigator via email (self-selection). Additionally, to target more fathers specifically, interested mothers were asked if their partner would be interested in participating as well.

To meet inclusion criteria, participants had to be a parent of a child (biological, adoptive, foster, or step) that was not older than 17-years at any time during their participation in the study. There were no exclusion criteria that eliminated individuals from eligibility to participate. Individuals' data

were only excluded from final analyses in cases where video data was missing thus rendering comparisons impossible. In total, there were 18 father-child dyad participants.

Demographic data show the study population to be predominately homogenous. Although the construct of emotional availability is dyadic in nature [16], the participants described here refers to the fathers as they are the direct recipient of the intervention (and the children in the dyads are referred to as child participants). Of the fathers, 22% were 25-34 years old, 61% ages 35-44, and 17% were 45-54 (participants are surveyed for age range and not exact age). A highly educated sample, 78% of participants held a post-graduate degree, 6% had some post-graduate education, and 17% had a college degree. As far as relationship status, 77% responded they were currently married, 17% that they were in a committed relationship, and 6% single. All participants reported they were White and non-Hispanic. All fathers were the biological parent of their child in the study except one participated with his stepchild. The child participants involved in the study ($M = 5.08$ years, range: 4 months-13.5 years) were 61% male and 39% female.

2.2 Procedure

The university's Institutional Review Board (IRB) approved this project (# 2167). All participants first completed the consent process, culminating in signed consent forms, before continuing with intervention procedures (Figure 1). For pretest sessions, all fathers completed demographic information, the Emotional Availability Self Report (EA-SR, [43]), and the Flourishing Scale (FLS; [44]) via Qualtrics, followed by a 20-minute filmed interaction filmed via Zoom, and later coded for EA. Before filming began, parents were instructed to interact with their child as they normally would, yet allowing the researcher to briefly interject to ensure the filming best captured components necessary for later coding (e.g., child and parent are facing the camera to observe affect, and that the microphone is operating adequately). The Immediate Intervention Group (IIG; who received one pretest before the intervention and one posttest after the intervention) participated in a 3-5 week intervention delivery involving a 2-hour interactive Zoom workshop where information about EA, attachment, and mindfulness was provided, followed by a 1-hour individualized, Zoom EA feedback/coaching session, and 2 weeks of text reminders about the covered content. In contrast to the IIG, the Waitlist Control (WC) participants received two pretests (same assessments as above) separated by the 3-5-week time period corresponding to the timing of intervention delivery for the IIG. After the second pretest, they received the same intervention as the IIG. All IIG and WC fathers received posttest sessions (same assessments as the pretests).

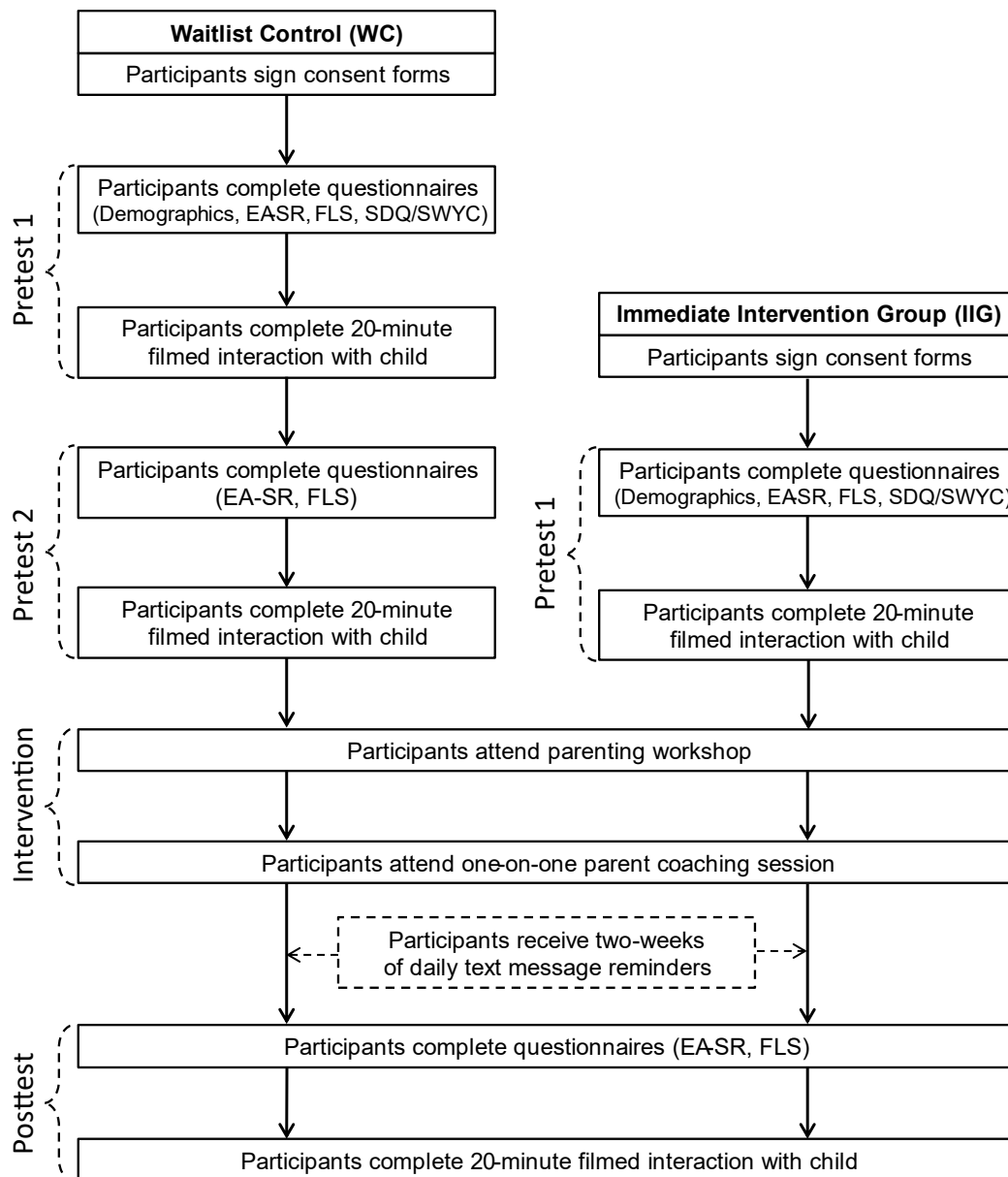


Figure 1 EA Brief intervention procedures flow chart.

2.3 Intervention Components

2.3.1 Parenting Workshop

The parenting workshop was conducted via Zoom and was led by a member of the research team. Using PowerPoint, a standard presentation was provided for all participants. Questions and interactions were encouraged. The parenting workshop took approximately two hours and consisted of psychoeducation related to mindfulness, emotional availability, and attachment. The mindfulness component included two meditation practices and guidance on applying mindfulness to parenting. The emotional availability instruction defined the concept and presented examples of high-, medium-, and low-quality interaction characteristics for each of the six dimensions (sensitivity, structuring, nonintrusiveness, nonhostility, child responsiveness, and child involvement; [20]). Attachment, and its conceptual similarities to emotional availability, were also covered [27].

2.3.2 EA Feedback and Coaching Session

After the workshop was completed, a member of the research team was assigned as a coach for each parent and the coach reached out to schedule the individualized feedback/coaching session. Precoaching plans were developed with input from other members of the research team to use time-stamped moments from the 20-minute pre-test video(s) to highlight EA concepts exemplified by particular moments of the interaction. The coach was prepared with suggestions, questions, and talking points to engage in a conversation with the father about what he and the coach noticed from the interaction. During the one-on-one feedback/coaching session, completed over Zoom, the coach played the pre-selected video clips and prompted the father to consider applications of principles from the workshop. Many fathers were able to see aspects of EA in their interactions and often responded with potential self-corrections. The coach either built on these comments or introduced additional observations and asked the father for further reflection. Before concluding, the coach suggested a singular goal for the parent to consider in future interactions, likely targeting the EA dimension with the biggest opportunity for improvement. For example, a parent scoring low on the structuring dimension might have been given a goal such as, “Whenever you reach to do something for your child, notice yourself reaching and think: how could I make this accessible for him to do himself?” At the conclusion of the feedback/coaching session, the parent was asked to practice the goal and apply other learned concepts in 30-minute daily interactions with their child; if this sustained 30 minutes was not possible, due to work or other constraints, they were asked to engage in shorter interactions that might add up to 30 minutes over the course of the day or simply as much as feasible.

EA coaches were either those who were fully EA trained on the EA System (see below) or they involved graduate students who were trained through a simpler, practical approach, referred to as the *EA Practitioner Guide* [45]. This is a brief training that provides background and knowledge about the EA dimensions, but ultimately, relies on supervision by a group of fully EA-trained/certified group members who can guide the coach toward an accurate pre-coaching plan. Thus, no coach entered a session without a group of fully trained EA professionals providing clear feedback on what was to be covered.

2.3.3 Text Reminders

Over the next two weeks, fathers received automated, personalized text messages three times per day as reminders of the concepts presented in both the workshop and coaching session. These text messages were developed in collaboration with an mHealth expert and were identical to those used in McConnell et al. [38]. The personalized element considers differential scoring across dimensions. For example, a father considered high in nonintrusiveness may have received a text like “Keep following your child’s lead and be ready to jump into the play!” while a father considered low in the measure may have received “Be patient: notice your child’s intentions and follow along when he/she has an idea.”

2.4 Treatment Fidelity

Author Biringen watched the video of every feedback/coaching session in the study and used a form referred to as the Precoaching Plan to make sure that each of the sessions adhered to the plan

(an example Precoaching Plan can be available upon request, with some training). Because recordings were reviewed in a timely way and reviewed at a weekly group meeting, feedback was promptly given to the coach on any departures from the Precoaching Plan. On average, for each coach, there was one session in which this may have occurred or there was some lack of clarity on adherence to the Precoaching Plan. Outside of that, each EA coach was meticulous in making sure that all items were addressed in a single coaching session.

2.5 Measures

2.5.1 Flourishing Scale (FLS)

The FLS is an 8-item survey that measures self-perceptions of general well-being [44] and can be used in the context of parenting [38]. The FLS provides respondents with eight statements on purpose, optimism, relationships, and self-esteem and provides 1–7 Likert-type response options (1 = *strongly disagree*, 7 = *strongly agree*). A composite score for flourishing is calculated by summing the values on all items. High scores (close to 56-point ceiling) indicate the respondent perceives themselves to be psychologically strong and resourceful [44].

2.5.2 Observed EA Scales

Observed EA was scored by trained research team members who had been certified reliable on the EA Scales viewing the recorded dyadic interactions. Coders were kept blind to the actual order of the videos and had no other knowledge of the dyad. The EA Scales [20] determine direct scores (out of seven) and total scores (using two seven-point and five three-point subscales) for each of the six EA dimensions (sensitivity, structuring nonintrusiveness, nonhostility, child responsiveness, and child involvement). While total scores were included when comparing baseline values for the WC and IIG or for inter-rater reliability, only direct scores were considered in the primary analyses for the study. Evidence for the acceptable reliability of the EA Scales has been presented across many studies that assess inter-rater reliability, test-retest reliability, as well as measures of validity, including links with attachment (e.g., Strange Situation Procedure, the Attachment Q-Sort, and the Adult Attachment Interview; [46]).

The Emotional Attachment/Emotional Availability Clinical Screener was created to provide summary scores (i.e., clinical screener scores for both adult and child, out of 100). Additionally, the EA zone assesses attachment style for both adult and child (i.e., determines classification of the relationship). Knowing the EA zone and a holistic score for EA is useful for coaching purposes because those measures can be quickly determined from videos so tailored coaching plans can be developed on a short timeline. For the study, this measure was used to assess the variables adult clinical screener, child clinical screener, adult EA zone, and child EA zone. The screener uses point values for each emotional availability classification: 81-100 for highly emotionally available, 61-80 for complicated, 41-60 for detached, and <40 for problematic. The coder determines the appropriate EA classification demonstrated in the filmed interaction and then chooses a numerical value within that classification's range. For example, the coder may determine the parent's inconsistent expressions of sensitivity merit the *complicated* zone but still demonstrates high levels of affective warmth, then that parent may be scored as a 78. Subsequently, the child may cling to the parent and not explore the play area, also typical of the *complicated* zone, while showing bland

affect, thus garnering perhaps a 65. The EA zone classifications are converted into ordinal values (i.e., adult and child EA zone: 4 = highly emotionally available, 3 = complicated, 2 = detached, 1 = problematic) for analyses.

2.6 Inter-rater Reliability

Two trained coders scored videos and scores were compared to establish inter-rater reliability. The six observed EA dimensions were coded for ten cases. The intraclass correlation (ICC) for sensitivity was 0.84. The ICC for structuring was 0.66. The ICC for nonintrusiveness and nohostility were low, at 0.49 and 0.45, respectively., and with scores with low variability. Upon further examination we saw that except for two cases, all scores for nonintrusiveness were within 1.5 points, indicating 80% agreement. For nonostility, all scores were within 1.5 points, except for one case, indicating 90% agreement. The ICC for child responsiveness was 0.88. The ICC for child involvement was 0.85

2.6.1 Emotional Availability Self-Report (EA-SR)

The EA-SR was used to collect self-report data on fathers' self-perceptions of EA. The EA-SR features 36 total items with 5-point Likert-type responses ranging from "Do not agree at all" to "Totally agree." Vliegen et al.'s [43] conducted factor analysis which yielded five factors: mutual attunement, child involvement, affect quality, intrusiveness, and hostility. These five factors yielded good internal reliability and construct validity [43]. Scoring was accomplished by adding the highest loading items for each of the factors.

2.6.2 Survey of Well-being of Young Children (SWYC) or Strengths & Difficulties Questionnaire (SDQ).

Due to the wide age range of the children in the sample, the SWYC was completed by parents of children up to two years old and the SDQ was completed for children two and older, as neither is designed for all ages. Both the SWYC and SDQ assessments are used as overview measures to provide a general idea of behavioral, emotional, and social functioning of children as reported by parents and to determine if further assessment is warranted [47-49]. The SWYC asks parent respondents to evaluate the regularity of their child exhibiting certain physical or verbal abilities associated with developmental milestones [47]. Additionally, the SWYC assesses up through 15-months, includes the Baby Pediatric Symptom Checklist (BPSC) that considers the child's general irritability, the child's inflexibility to changing contexts, and difficulty adhering to routines; the SWYC for 18-months and older includes the Preschool Pediatric Symptom Checklist (PPSC) that asks about emotional and social behaviors. The SDQ is a 25-item questionnaire the uses 3-point Likert-type scale responses (not true, somewhat true, certainly true) for statements related to emotional problems, conduct problems, hyperactivity, peer problems, and sociability [48, 49]. A total score is calculated by summing the emotional problems, conduct problems, hyperactivity, and peer problems scales. If a child was found to have a SWYC score on any sub-section in the "Needs Review" range or had a total score on the SDQ that would be categorized as anything other than "Close to average", then the child was noted as a having potential clinical concerns. While this does not provide absolute insight into whether a child may have developmental delays or a diagnosis, it provides some reference for relevant developmental factors.

2.7 Analytic Plan

Prior to running the focal analyses, baseline values for the WC and the IIG were tested for any significant group differences. Subsequently, to analyze the data, difference scores were calculated for the 16 target variables by subtracting pre-test scores from posttest scores. Tests for normality were completed to consider if skewness and kurtosis levels fell within appropriate ranges. Correlations between socio-demographic variables and each of the outcomes (change scores) were estimated. The first of the focal analyses consisted of independent samples *t*-tests to test for intervention effects (i.e., whether change scores for the 16 target variables were significantly different than zero) using the combined data from both IIG and WC groups. For the second set of focal analyses, we compared pre-to-post changes in the IIG group vs. the WC group (across their no-intervention period) to determine whether there was causal evidence of an intervention effect. In other words, we (a) conducted observational analyses using the combined data from both groups for increased statistical power and (b) conducted experimentally controlled analyses comparing the IIG vs. WC (prior to the latter’s intervention) to determine whether there was evidence of a causal effect of the intervention.

A priori power analysis was conducted to determine the required sample size needed to detect intervention effects. Based on initial testing of this intervention done by McConnell et al. [38], a medium-to-large effect size of Cohen’s *d* = 0.71 and an $\alpha = 0.05$ and $\beta = 0.80$ was used. The power analysis indicated that a sample size of *n* = 18 would be necessary [50]. Additionally, another a priori power analyses was conducted to determine the required sample size needed to make group comparisons using a repeated measures ANOVA. Again based upon McConnell et al.’s [38] initial findings, an effect size of Cohen’s *d* = 0.32 was used ($\alpha = 0.05$; $\beta = 0.80$). The power analysis indicated that a total sample size of *n* = 14 would be necessary [50]. This indicates that the current sample size, though small, was sufficient to detect post-pre differences as well as group differences (intervention group versus waitlist control).

3. Results

3.1 Baseline Comparisons

Baseline comparisons were conducted to compare the two study groups, the immediate intervention group (IIG; *n* = 9) and the waitlist control (WC; *n* = 9), to consider if values at the outset (timepoint 1; P1) may impact any potential intervention effects. An independent samples *t*-test compared mean scores for each of the 16 target variables as well as total scores for the six observational EA Scales (Table 1).

Table 1 Independent samples *t*-test comparing baseline values for two study groups (IIG and WC).

Assessment	Variable	Group	Mean	Std. Dev.	<i>t</i>	<i>p</i>
Flourishing Scale	Flourishing	IIG	54.11	4.06	-1.011	0.327
		WC	52.67	1.36		
EA Clinical Screener	Adult Clinical Screener	IIG	72.11	15.82	-0.753	0.462
	Child Clinical Screener	WC	66.22	17.32		
	Child Clinical Screener	IIG	74.33	14.56	-0.601	0.556

		WC	70.22	14.64		
	Adult EA Zone	IIG	3.11	0.93	-0.508	0.618
		WC	2.89	0.93		
	Child EA Zone	IIG	3.11	0.87	-0.263	0.796
		WC	3.00	0.93		
	Sensitivity (total)	IIG	22.17	3.82	-0.476	0.640
		WC	21.28	4.09		
	Sensitivity (direct)	IIG	4.67	1.09	-0.885	0.389
		WC	4.17	1.30		
	Structuring (total)	IIG	25.00	2.18	-0.803	0.434
		WC	24.22	1.92		
	Structuring (direct)	IIG	5.50	0.83	-0.870	0.397
		WC	5.11	1.05		
	Nonintrusiveness (total)	IIG	24.78	4.09	-0.442	0.664
		WC	23.94	3.91		
	Nonintrusiveness (direct)	IIG	5.44	1.36	-0.300	0.768
		WC	5.28	0.97		
EA Scales	Nonhostility (total)	IIG	28.28	1.15	-1.985	0.065
		WC	26.33	2.70		
	Nonhostility (direct)	IIG	6.83	0.25	-2.138	0.048*
		WC	6.17	0.90		
	Child Responsiveness (total)	IIG	23.28	3.15	-0.891	0.386
		WC	21.89	3.45		
	Child Responsiveness (direct)	IIG	4.72	1.09	-0.463	0.649
		WC	4.50	0.94		
	Child Involvement (total)	IIG	22.00	4.60	-0.094	0.927
		WC	21.83	2.72		
	Child Involvement (direct)	IIG	4.78	1.28	-0.305	0.764
		WC	4.61	1.02		
	Mutual Attunement	IIG	3.22	0.61	-0.192	0.850
		WC	3.17	0.62		
	Child Involvement	IIG	4.41	0.32	-1.449	0.167
		WC	4.05	0.67		
EA-SR	Affect Quality	IIG	4.58	0.27	-0.138	0.892
		WC	4.56	0.40		
	Intrusiveness	IIG	3.11	0.56	-1.357	0.194
		WC	2.76	0.54		
	Hostility	IIG	2.28	0.98	1.260	0.226
		WC	2.89	1.08		

Note. * $\alpha < 0.05$ level

Analyses yielded statistically significant differences between the IIG ($M = 6.17, SD = 0.90$) and the WC ($M = 6.83, SD = 0.25$) for only the coded (observational) nonhostility direct scores, $t(16) = -2.14, p < 0.05$. This finding represents a significant difference of minimal clinical importance. Considering this difference from a clinical perspective, coding a nonhostility direct score as a 6 would indicate a singular instance of covert hostility such as the parent appearing bored or momentarily frustrated

while a 7 would entail no signs of hostility. Despite the difference in values, they are also within the same range (5.5 to 7) of coded nonhostility that defines the parent as fundamentally non-hostile. Moreover, analyses comparing direct effects or controlled comparisons discovered no significant effects for coded nonhostility direct scores.

3.2 Normality Testing

Difference scores for the 16 target variables were calculated by subtracting pretest values (collected at T1 for the IIG; collected at T2 for the WC) from posttest values. Across outcomes, SPSS skewness ranged from -1.52 to 1.85, and kurtosis ranged from -1.085 to 6.89. These values were within the respective ranges recommended by Hair et al. [51] when checking data normality.

3.3 Correlations

Correlations between socio-demographic variables and each of the outcomes are presented in Table 2. None of the correlations met the criterion ($\alpha < 0.05$) for statistical significance.

Table 2 Correlations between socio-demographic variables and EA-related outcomes.

<i>Pre-to-Post Changes in:</i>	<i>Demographic Variables</i>					
	<i>Point-Biserial Correlations</i>			<i>Spearman's Rho Correlations</i>		
	<i>Parent Married</i>	<i>Child's Sex (Male)</i>	<i>Potential Clinical Concerns</i>	<i>Parent Education</i>	<i>Parent Age</i>	<i>Child Age</i>
FLS Composite	-0.182	-0.226	-0.339	0.288	0.113	0.205
Sensitivity (Observed, Direct)	0.131	-0.189	0.069	0.086	-0.269	-0.335
Structuring (Observed, Direct)	0.030	0.194	0.338	0.031	-0.280	-0.448
Non-intrusiveness (Observed, Direct)	0.265	0.025	0.287	0.278	-0.454	-0.434
Non-hostility (Observed, Direct)	0.120	-0.365	0.000	0.192	-0.305	-0.165
Child Responsiveness (Observed, Direct)	0.166	0.106	0.263	-0.040	-0.278	-0.363
Child Involvement (Observed, Direct)	0.041	0.229	0.355	-0.010	-0.245	-0.380
EA-SR for Mutual Attunement	-0.083	0.116	-0.162	-0.046	0.137	0.388
EA-SR for Child Involvement	0.129	-0.133	-0.312	-0.174	0.016	-0.290
EA-SR for Affect Quality	-0.206	-0.165	-0.187	0.211	-0.066	0.133
EA-SR for Intrusiveness	0.176	-0.171	-0.111	0.100	0.016	-0.367
EA-SR for Hostility	-0.066	-0.027	0.114	0.331	-0.234	-0.091
Adult Clinical Screener	0.007	-0.237	0.225	0.106	-0.161	-0.149
Child Clinical Screener	-0.131	-0.025	0.352	0.087	-0.282	-0.343
Adult EA Zone	0.034	-0.147	0.376	0.335	-0.305	-0.045
Child EA Zone	-0.230	-0.109	0.260	0.110	-0.206	-0.224

Note. Demographic variables for point biserial correlations were dichotomized from the original categorical variables due to sparse category membership and/or to facilitate interpretation of the correlations.

3.4 Direct Intervention Effects

To determine significant differences between pretest measures and post-intervention effects, difference scores were used. A one-sample *t*-test was then conducted on the 16 study variables (Table 3).

Table 3 One-sample *t*-test on difference scores testing intervention effects, post-test versus pre-test.

Assessment	Variable	Mean	Std. Dev.	<i>t</i>	<i>p</i>
Flourishing Scale	Flourishing	-4.67	3.97	-4.987	<0.001***
	Adult Clinical Screener	11.61	10.83	4.551	<0.001***
EA Clinical Screener	Child Clinical Screener	11.17	10.07	4.707	<0.001***
	Adult EA Zone	0.72	0.75	4.075	<0.001***
EA Scales	Child EA Zone	0.67	0.77	3.688	0.002**
	Sensitivity	1.11	0.78	6.063	<0.001***
	Structuring	0.78	0.81	4.082	<0.001***
	Nonintrusiveness	0.64	0.90	2.997	0.008**
	Nonhostility	0.19	0.60	1.381	0.185
	Child Responsiveness	0.92	0.83	4.703	<0.001***
	Child Involvement	0.86	1.17	3.114	0.006**
	Mutual Attunement	0.23	0.39	2.512	0.022*
EA-SR	Child Involvement	0.26	0.52	2.134	0.048*
	Affect Quality	0.06	0.36	0.664	0.516
	Intrusiveness	-0.16	0.39	-1.696	0.108
	Hostility	-0.12	0.77	-1.077	0.297

Note. * $\alpha < 0.05$ level; ** $\alpha < 0.01$ level; *** $\alpha < 0.001$

Analyses indicated statistically significant results for 12 of the 16 variables for direct intervention effects. Flourishing ($M = -4.67$, $SD = 3.97$) was statistically significant, $t(17) = -4.99$, $p < 0.001$, such that it decreased over the course of the intervention, in contrast to the relevant study hypothesis. Significant results were found for adult clinical screener ($p < 0.001$), child clinical screener ($p < 0.001$), adult EA zone (number; $p < 0.001$), child EA zone (number; $p = 0.002$). The observed EA variables of sensitivity ($p < 0.001$), structuring ($p < 0.001$), nonintrusiveness ($p = 0.008$), child responsiveness ($p < 0.001$), and child involvement ($p = 0.006$) were significantly different in the direction indicating improved emotional availability. Self-reported EA was significantly improved for mutual attunement ($p = 0.022$) and child involvement (SR; $p = 0.048$).

3.5 Control Versus Intervention Effects

A one-way ANOVA was performed to establish intervention effects as functioning independently from any natural variability over time (Table 4). Difference scores were used to compare the IIG’s target variables’ changes (between pretest and post-test) and the WC’s (during their non-intervention phase between pretest 1 and pretest 2).

Table 4 One-way Analysis of Variance (ANOVA) on difference scores, IIG intervention phase versus WC control phase.

			Sum of Squares	df	F	Sig
Flourishing Scale	FLS Composite	Between	32.000	1	2.642	0.124
		Within	193.778	16		
		Total	225.778	17		
EA Clinical Screener	Adult Clinical Screener	Between	430.222	1	4.838	0.043*
		Within	1422.889	16		
		Total	1853.111	17		
	Child Clinical Screener	Between	501.389	1	6.272	0.023*
		Within	1279.111	16		
		Total	1780.500	17		
	Adult EA Zone	Between	2.000	1	5.333	0.035*
		Within	6.000	16		
		Total	8.000	17		
Child EA Zone	Between	1.389	1	3.226	0.091	
	Within	6.889	16			
	Total	8.278	17			
EA Scales	Sensitivity	Between	4.500	1	10.368	0.005**
		Within	6.944	16		
		Total	11.444	17		
	Structuring	Between	1.681	1	2.060	0.171
		Within	13.056	16		
		Total	14.736	17		
	Nonintrusiveness	Between	0.681	1	0.693	0.418
		Within	15.722	16		
		Total	16.403	17		
	Nonhostility	Between	0.889	1	2.783	0.115
		Within	5.111	16		
		Total	6.000	17		
	Child Responsiveness	Between	3.125	1	7.143	0.017*
		Within	7.000	16		
		Total	10.125	17		
Child Involvement	Between	4.500	1	6.545	0.021*	
	Within	11.000	16			
	Total	15.500	17			
EA-SR	Mutual Attunement	Between	0.180	1	1.518	0.236
		Within	1.898	16		
		Total	2.078	17		
	Child Involvement	Between	0.099	1	0.815	0.380
		Within	1.940	16		
		Total	2.039	17		

	Total	2.038	17		
Affect Quality	Between	0.036	1	0.366	0.554
	Within	1.556	16		
	Total	1.591	17		
Intrusiveness	Between	0.446	1	3.451	0.082
	Within	2.068	16		
	Total	2.514	17		
Hostility	Between	0.006	1	0.038	0.847
	Within	2.580	16		
	Total	2.586	17		

Note. * $\alpha < 0.05$ level; ** $\alpha < 0.01$ level

The one-way ANOVA, $F(1, 16)$, revealed statistically significant differences for the adult clinical screener ($p = 0.043$), child clinical screener ($p = 0.023$), for the adult EA zone ($p = 0.043$), sensitivity ($p = 0.005$), child responsiveness ($p = 0.017$), and child involvement ($p = 0.021$). Considering the difference scores were all positive (due to post-intervention values being higher than pre-intervention), these findings indicate improvement along the six dimensions with statistically significant findings. These results show that fathers who received the intervention display more improvement in emotional availability over time than those who did not.

3.6 Intervention Effect Sizes

Although significant findings were not detected for several dimensions, effect sizes were calculated to consider any impacts of the intervention not reflected in group differences (Table 5). The one-sample t -test of subjects' intervention phase difference scores found significant differences for 12 of the 16 variables. However, large effects were found for adult clinical screener ($d = 1.04$, 95% CI [0.45 – 1.60]), child clinical screener ($d = 1.08$, 95% CI [0.49 – 1.66]), adult EA zone ($d = 0.96$, 95% CI [0.39 – 1.51]), sensitivity ($d = 1.23$, 95% CI [0.60 – 1.84]), and child responsiveness ($d = 0.90$, 95% CI [0.34 – 1.44]). Medium effects were found for flourishing ($d = -0.61$, 95% CI [-1.10 – -0.09]), child EA zone ($d = 0.79$, 95% CI [0.25 – 1.31]), structuring ($d = 0.66$, 95% CI [0.14 – 1.17]), nonintrusiveness ($d = 0.58$, 95% CI [0.07 – 1.07]), child involvement ($d = 0.62$, 95% CI [0.11 – 1.12]), mutual attunement ($d = 0.57$, 95% CI [0.06 – 1.06]), and intrusiveness (self-report; $d = -0.54$, 95% CI [-1.03 – -0.03]). A small effect was found for child involvement (self-report; $d = 0.37$, 95% CI [-0.11 – 0.84]).

Table 5 Effect sizes of intervention effects, post-test versus pre-test.

Assessment	Variable	Cohen's d	Lower	Upper
Flourishing Scale	Flourishing	-0.605	-1.102	-0.093
EA Clinical Screener	Adult Clinical Screener	1.035	0.448	1.601
	Child Clinical Screener	1.081	0.485	1.657
	Adult EA Zone	0.961	0.389	1.513
	Child EA Zone	0.786	0.246	1.308
EA Scales	Sensitivity	1.233	0.604	1.841
	Structuring	0.663	0.143	1.167

	Nonintrusiveness	0.577	0.069	1.070
	Nonhostility	0.000	-0.462	0.462
	Child Responsiveness	0.902	0.342	1.444
	Child Involvement	0.622	0.108	1.120
EA-SR	Mutual Attunement	0.570	0.063	1.062
	Child Involvement	0.369	-0.114	0.843
	Affect Quality	0.128	-0.338	0.590
	Intrusiveness	-0.536	-1.025	-0.034
	Hostility	-0.143	-0.605	0.323

4. Discussion

The findings indicated improvements in observed EA in several key dimensions. Improvements were detected for the observed adult screener score, child screener score, adult zone, sensitivity, child responsiveness, and child involvement. No significant findings were detected on self-reported EA.

As coded on the EA clinical screener, increases in these values (adult screener score, child screener score, and adult zone) indicates that fathers were able to synthesize information provided in the workshop or coaching sessions in ways that meaningfully impacted their observed relationship quality. Improving within a zone (e.g., showing a significant increase in the numerical value of the screener score, say 45 to 58, but both scores still falling within the detached zone, which ranges from 41 to 60) indicates that although the attachment-based relationship remains the same, more warmth or awareness of the child’s cues can be detected. Actually changing zones signifies that improvement in warmth or cue perception is amply different to suggest the very nature of the relationship has improved to a higher designation of dyadic functioning (e.g., detached to emotionally available). Either type of change represents valuable progress and supports the primary objectives of the intervention.

Similarly, as related to observed emotional availability, findings indicated improvements for sensitivity, child responsiveness, and child involvement. The improvement for sensitivity captures fathers’ capacity to apply the feedback and coaching in ways that positively impacted their warmth and ability to perceive their child’s cues. Nonetheless, capturing improvements for the two child dimensions illuminates a somewhat surprising finding. Since fathers are the target participants for the intervention, the observation of demonstrable child changes suggest the presence and active use of new parenting skills. This finding also illustrates that children are readily receptive to positive behavioral changes in their fathers—and jump at the opportunity to positively engage with them.

The correlations conducted found no significant associations between demographic features (child age, child gender, parent age, education level, marriage status) or if the fathers had potentially clinical-level concerns about their child’s functioning. This suggests that fathers can expect to experience improvement in EA as a result of the intervention, regardless of these factors. It stands that the cultural and ethnic homogeneity of the sample does necessitate further research to explore if that could play a role in efficacy.

The most unanticipated result pertains to how changes in self-reported emotional availability were not detected despite significant findings in observable emotional availability. This stands in contrast to the mother data collected in the same research project [39] which found clear

improvements in many facets of maternal self-reported EA. This begs the question of why fathers would behave more proficiently in these parenting interactions despite not perceiving themselves as improved.

Perhaps fathers conceptualize their role as a parent in a deficit model. In other words, the cultural influence of traditional family structures may position the father as a secondary caregiver (either implicitly or explicitly). That creates an implied *less-than* mentality such that fathers consider themselves to be less proficient caregivers than mothers. This less-than mentality may frame their thinking about deficiencies in their parenting. Alternatively, the psychoeducation provided in the workshop may have provided a brand new framework for fathers to evaluate their parenting. Upon learning about nuances of parenting (structuring, affective warmth, etc.), fathers may then grade themselves more harshly because they have suddenly been made aware of parenting practices they have never considered before and feel negatively about having been unaware. This highlights the necessity to address fathers' self-awareness and self-confidence regarding their parenting. Perhaps, recruiting partners to "build up" their identity as a parent is one avenue to bring awareness to fathers' needs to hear affirmations of their efforts and parenting capabilities. As a function of the intervention, post-test follow-ups that provide positive reinforcement of improvements (e.g. a coach reflecting that the father's affect is significantly warmer and noting the child's positive reactions to it) may help cement the benefit of those efforts.

The questions around the fathers' self-report data and general self-perceptions bears additional questions. Representations of attachment impact relationships and downstream behavior [52]. The children in our study, as shown by the improvement in the observed child measures (responsiveness and involvement), seemed primed to update their representation when the fathers' presentations changed. However, mothers' representations of their own attachment is related to reflective functioning that supports building secure attachment [53]. The fathers mentalizations of attachment with their child, as best reflected by their EA self-reports, may indicate that fathers bypass revising their representations and focus exclusively on changing behaviors. The effect of that is unknown: whether that behavior shift modifies the system enough to engage long-term improvement, fathers representations do change over time in reaction to those family system improvements, or if representations never shift and it impedes desired changes from being retained.

Despite lack of significant findings on fathers' self-report, fathers showed significant observed improvement in their interactions as related to the EA Brief. This research provides insight that fathers can improve their affective relationship with their children. It may help us update perspectives on fatherhood and to consider fathers as capable emotional providers for their children. Importantly, however, fathers are able to use feedback and can be coached towards higher quality interactive patterns with their children. Such malleability on the part of fathers argues for the need for improved policy decisions regarding parental leave, custody arrangements, and funding more father-child-centered initiatives.

In the scope of parenting interventions, the EA Brief demonstrates comparability to other evidence-based treatments. PCIT is one of the most extensively researched interventions and consistently demonstrates effectiveness [54]. However, PCIT is used primarily with clinical samples and measures behavioral outcomes (child externalizing, compliance) with less focus on dyadic functioning for the general population. Additionally, typical treatment for PCIT requires weeks of sessions and even a more intensive version of PCIT (I-PCIT) that holds sessions daily over two consecutive weeks, requires a significant time commitment [55]. Triple P-Positive Parenting

Program features a multi-level approach to meet participant needs which includes group psychoeducation, akin to the workshop, or tailored one-on-one sessions, similar to coaching sessions [56]. Meta-analysis for Triple P found medium or small effect sizes. The Incredible Years parenting program targets parenting practices with a focus on behavior but also acknowledging relationship qualities like affective warmth ($d = 0.34$ for child effects, $d = 0.30$ for parenting effects; [57]). However, similar to PCIT, most measures focused on behavioral outcomes—wherein conduct problems and ADHD symptomology improved—though findings related to emotional problems found no improvement.

Of course, video feedback is a significant feature of the EA Brief and thus comparison to interventions using that modality should be noted. The Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) similarly addresses key elements of secure functioning in parent-child dyads [58]. Moreover, VIPP-SD uses a protocol of filming dyadic interactions followed by video feedback that, while following standard guidelines, is tailored specifically to the family. The effect size for VIPP-SD for sensitivity was a medium effect ($d = 0.47$) compared to EA Brief's large effect ($d = 1.23$), although VIPP-SD frequently works with higher-risk populations including families experiencing poverty, adoptive families, dyads where the child has autism spectrum disorder (ASD), etc. The Marte Meo method [59] is another video feedback treatment that focuses primarily on behavior-based concepts with mothers. The method features limited empirical support but was found to show significant improvement at assessments post-intervention, though was not different than treatment as usual at a six-month follow-up [60]. The researchers did find that the Marte Meo method was most effective for mothers with depression symptoms, indicating efficacy with higher-risk populations.

Lastly, the EA Brief is designed to address the presentation of EA such that a seed is planted for how to pursue better father-child relationship quality—not as an end-all, be-all intervention. The brevity of the intervention is a pivotal factor, making juxtaposition to single-session interventions necessary. For example, Nicolson et al. [61] found that the Adolescent Mother Program: Let's meet your baby as a person (AMPLE) utilized a similar structure (one group session of psychoeducation and a session of guided attachment-based exploration for individual participants). The intervention used the EAS and was found to be useful for adolescent mothers ($d = 0.42$ for sensitivity, $d = 1.06$ for nonintrusiveness, $d = 0.66$ for nonhostility).

Future work will determine the effectiveness of the EA Brief as a single session of detailed video analysis and video feedback. Because the EA Brief provides a very detailed, time-stamped way of delivering analysis and feedback, we invite future research on this approach that uses the well-established EA framework to provide such input to the parent.

4.1 Limitations and Future Directions

Although recruitment was persistent and multi-faceted, enrolling fathers was challenging, and thus the small sample size. Further, although efforts were made to partner with organizations in the area that provide support to higher need families, recruiting efforts to target lower SES (as indicated by education status) populations were not very successful. Subsequent iterations of this study must find a way to reach more diverse populations so that possible cultural, racial, ethnic factors can be appropriately evaluated. Additionally, more in-depth analyses can be conducted on future data with larger samples to consider covariates, such as comparing mothers and fathers or participant SES,

that may influence efficacy for particular populations. Research in clinical settings is also encouraged.

Author Contributions

Michael Lincoln: Original writing, data analysis; Dr. Stephen Aichele: Methodology; Emma L. M. Clark: Project management, assessment coding; Maggie Dungan: Project management; Dr. Ashley Harvey: Review and editing; Lillian Hoyer: Project coordination; Yuqin Jiao: Project management; Steffany Joslin: Assessment coding; Frances Russell: Project management; Dr. Zeynep Biringen: Supervision.

Competing Interests

Author Biringen discloses a conflict of interest as she is the developer of the EA System and stands to gain from favorable findings. As such, she distances herself from close data handling and data analysis. The other authors declare no conflict of interest.

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