



Research article

Community implementation outcomes of Attachment and Biobehavioral Catch-up



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ABSTRACT

Bringing evidence-based treatments to community practice is a critical challenge for the field. When implemented in the community, evidence-based treatments often fail to provide the benefits shown in laboratory settings. Therefore, when evidence-based treatments are transported to the community, it is essential to investigate implementation process and outcomes. The present study assessed whether Attachment and Biobehavioral Catch-up (ABC), an intervention for high-risk parents that has been shown to be efficacious in randomized clinical trials (RCTs), changed parent behavior in a community-based setting. This study examined data collected from 78 cases by 9 parent coaches in a diverse community setting in Hawaii, and compared data to benchmarks from RCTs. Parent coach fidelity was coded from intervention session video clips, and was also compared with benchmarks. Caregivers participating in ABC were primarily birth parents, and most were referred through Child Protective Services involvement or for reasons of harsh parenting or neglect. Parental behavior was assessed before and after intervention using a semi-structured play task. Increases in parental following the lead and delight, and decreases in parental intrusiveness, were observed; these changes were comparable to effect sizes observed in RCTs. Intent to treat analyses were conducted using behavioral data from videotaped sessions, and suggested that ABC also improved following the lead in parents who subsequently dropped out of treatment. These results support the viability of ABC for enhancing parenting behavior among parents at high risk for maltreatment, and demonstrate that parent coaches in community agencies can successfully implement ABC.

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Introduction

In 2013, approximately 6.4 million children were involved in Child Protective Services (CPS) referrals (USDHHS, 2015). Children under age 3 made up 27.3% of all victims of child abuse and neglect in 2013, and children under 1 year had the highest rate of victimization, at 23.1 children per 1,000 (USDHHS, 2015). Early childhood maltreatment has been linked to negative outcomes such as disorganized attachment (Cyr, Euser, Bakermans-Kranenburg, & van IJzendoorn, 2010; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) and physiological and behavioral dysregulation (Bernard, Butzin-Dozier, Rittenhouse, & Dozier, 2010; Bruce, Fisher, Pears, & Levine, 2009; Cicchetti, Rogosch, Gunnar, & Toth, 2010). In early

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childhood, when children's social and physiological systems are developing rapidly, consequences of maltreatment may be particularly detrimental. Thus, provision of high quality services is critical for children during this developmental period, in order to prevent long-term consequences of abuse and neglect.

To this point, evidence-based interventions have not been used frequently in community settings (National Advisory Mental Health Council, 2001; President's New Freedom Commission on Mental Health, 2004). The services offered in child welfare settings typically lack strong research evidence to support their effectiveness, and rarely include evidence-supported interventions (Barth et al., 2005; Hurlburt, Barth, Leslie, Landsverk, & McCrae, 2007). However, recent implementation studies have provided encouraging findings regarding the potential effectiveness and transportability of evidence-based parenting programs in community welfare settings. For example, SafeCare and an adaptation of Parent–Child Interaction Therapy (PCIT) have been shown to reduce child maltreatment recidivism when implemented in community settings (Chaffin, Funderburk, Bard, Valle, & Gurwitsch, 2011; Chaffin, Hecht, Bard, Silovsky, & Beasley, 2012).

The Attachment and Biobehavioral Catch-up (ABC) intervention targets a specific niche within the child welfare population. Specifically, ABC was designed for maltreated infants and their parents, and addresses infants' attachment and regulatory problems. ABC uses an active coaching approach to support parents in developing behaviors that promote these outcomes in children. ABC targets three critical parent behaviors: nurturance, following the lead with delight, and frightening/intrusive behavior. First, parents are encouraged to respond in nurturing ways when their children are distressed. Nurturance is especially important in helping children develop secure and organized attachments (Leerkes, 2011; McElwain & Booth-LaForce, 2006). The second target includes two components: following the lead and delight. When children are not distressed, parents are encouraged to interact synchronously, following their children's lead in play and everyday activities. Following the child's lead, or parent–child synchrony, has been linked with children developing adequate regulatory capabilities (Bornstein & Tamis-Lemonda, 1997; Feldman, Greenbaum, & Yirmiya, 1999). Parents are also supported in taking delight in their children, or responding to their children with genuine positive affect and enjoyment, for example, smiling and laughing in response to children's behavior. Although data are more limited in linking delight to child outcomes, research on similar constructs, such as shared positive affect (e.g., Kochanska & Aksan, 1995) and maternal responsiveness to child positive affect (e.g., Feng, Shaw, Skuban, & Lane, 2007), suggest that delight may also play a role in children's development of behavioral and emotional regulation. Finally, parents are helped to recognize and inhibit intrusive or threatening behaviors that could be frightening to their children. Intrusive behaviors include overwhelming physical interactions, like tickling or squeaking a toy in the child's face, in which the parent ignores the child's attempts to disengage; more overtly frightening behaviors include using a harsh tone or yelling when setting limits, and physical discipline. Parental frightening and intrusive behavior interferes with children's ability to regulate and organize their physiology and behavior (e.g., Hane & Fox, 2006; van Ijzendoorn et al., 1999).

ABC is conducted by clinicians referred to as "parent coaches" in 10 in-home sessions with families. During hour-long sessions, parent coaches discuss manualized content with caregivers, use structured practice activities, and present video feedback to highlight parents' intervention-targeted behaviors. The key active ingredient of intervention is thought to be in the moment feedback, which is used to support parents' in-session practice of behaviors targeted by ABC. Parent coaches make in the moment comments to point out when parents engage in intervention-targeted behaviors. Importantly, these comments draw attention to the specific behaviors of the parent (so that the parent understands what behavior is being addressed), link behaviors to the intervention targets (so that the parent can see how a specific behavior relates to intervention targets), and discuss the effects of the parent's behaviors on the child (so that the parent can see how the behavior will influence long-term outcomes for the child). Research from a randomized clinical trial of ABC found that more frequent in the moment feedback in an early session of intervention predicted higher frequency of parent following the lead in a later session, even when controlling for the parent's prior level of following the lead (Meade & Dozier, 2012).

ABC has been shown to decrease rates of disorganized attachment, and increase rates of secure attachment, among infants living with their CPS-involved birth parents (Bernard et al., 2012). ABC has also been found to normalize diurnal cortisol production of children living with high-risk birth parents, leading to higher morning values and steeper slopes across the day, when compared with children enrolled in a control intervention (Bernard, Dozier, Bick, & Gordon, 2015). Such differences in cortisol production are not only observed soon after intervention, but are also sustained 2 to 3 years following intervention (Bernard, Hostinar, & Dozier, 2015). Other long-term outcomes that have been observed among children include enhanced executive functioning (Lewis-Morrarty, Dozier, Bernard, Terraciano, & Moore, 2012) and emotion expression (Lind, Bernard, Ross, & Dozier, 2014). With regard to parenting outcomes, ABC has been found to increase maternal following the lead, and result in different patterns of parental brain activity than seen among parents in a control intervention condition (Bernard, Simons, & Dozier, 2015). Enhanced parenting following participation in ABC has also been found among mothers living with their infants in residential substance abuse treatment facilities (Berlin, Shanahan, & Appleyard Carmody, 2014). These final results are notable because they come from a study conducted outside ABC's laboratory of origin, providing preliminary support for the success of ABC implementation in new sites.

Current Study

Because ABC had been shown to be effective in improving parent behavior and child outcomes in randomized clinical trials, the next step was to examine its transportability to a new setting, that is, its outcomes when conducted by parent coaches in community agencies. Research on treatment transportability, or the study of how to successfully implement a treatment

in a new setting, is a key step between research on effectiveness and widespread treatment dissemination (Schoenwald & Hoagwood, 2001). The present study examined the implementation and outcomes of ABC in community practices during a training period in which parent coaches received expert-led consultation and supervision. We assessed parent behavior change using a semi-structured play activity that was conducted both pre- and post-intervention. Specifically, we examined changes in parental following the lead, intrusiveness, and delight. We also assessed parent coach outcomes, including fidelity coded from video clips of sessions, certification at the end of the training period, and percentage of cases that did not complete intervention. Because there was no control group in the design, we compared parent coach fidelity and parent behavior change outcomes to benchmarks found in clinical trials.

Method

Implementation of ABC

The implementation process began when the nonprofit foundation at which the second author worked sought to fund a project to support the work of Hawaii's 0-3 Early Court. First, foundation stakeholders met with a number of community agencies that provide services to the 0-3 population, in order to assess unmet needs. These conversations revealed unmet emotional needs of young children in the welfare system. The foundation then identified and evaluated several intervention models targeting the attachment and emotional needs of young children in the welfare system. ABC was selected as the intervention model to be used because it was home-based, provided strong training and supervision of clinicians, and was cost-effective. The proposal was presented to Early Court and Child Welfare Services (CWS), which both agreed to be referral sources for enrolling children in the intervention. The foundation then conducted a pilot trial with one parent coach. Pilot outcomes suggested that there was demand for services in the CWS system, and that the ABC intervention was able to help CWS-involved families, leading the foundation to move forward with the implementation process.

Next, the second author sought to find agencies and clinicians to train in the ABC model. Through collaboration with CWS, it was determined that agencies with Early Healthy Start programs, which serve children aged 0-3 in the state welfare system, would be prioritized. Five agencies with Early Healthy Start programs were selected. Additionally, five other agencies serving the 0-3 population were selected, including a visitation/reunification center, an international adoption agency, a parent participation preschool, a residential home serving pregnant and new mothers, and a children's services agency without a CWS contract. It was determined that one clinician at each of these agencies would be trained as a parent coach, to achieve a maximum cross-section of agencies reaching the targeted population. To recruit potential parent coaches, the second author reached out to directors of these agencies to discuss ABC and the requirements of the training year. In conversations with agency directors, this individual assessed which employee at the organization would be best suited for ABC. Assessed qualities of potential parent coaches included motivation to learn and implement ABC, clinical experience with families, a current clinical job description, and likelihood to remain in Hawaii. From these informal screening interviews, ten clinicians were selected; one clinician was excluded because she did not meet the requirements.

In March 2012, these ten clinicians from various public and private agencies across the islands of Hawaii were trained in a 3-day training workshop on-site in Hawaii. Following the training workshop, 9 parent coaches began a year of ongoing supervision; one clinician did not implement ABC or participate in follow-up supervision because she moved into a different position within her agency soon after the training.

Supervision included video-conferenced group supervision, led by a Ph.D. level supervisor, as well as fidelity-focused individual sessions, led by undergraduate students who were expert coders (i.e., trained to a reliability criterion) in the fidelity coding system. During group supervision sessions, small groups of parent coaches reviewed session videos, discussed cases, and received clinical feedback from a supervisor. In fidelity-focused supervision sessions, individual parent coaches and supervisors reviewed fidelity coding, which was focused on in the moment commenting, from the parent coach's recent ABC sessions. During fidelity-focused supervision sessions, parent coaches received feedback on their own fidelity coding accuracy as well as their in the moment commenting. This supervision process was designed to help parent coaches improve their fidelity to ABC by refining their understanding of intervention-targeted behaviors, explicitly evaluating their performance relative to concrete in the moment commenting goals, and providing individualized guidance on how to improve in relation to these goals. Both types of supervision were conducted remotely using video conferencing software, and both were offered weekly. On average, parent coaches attended 36.6 (SD = 15.3, range = 8–54) group supervision sessions and 21.3 fidelity-focused supervision sessions (SD = 14.4; range = 0–40). Seven of the nine parent coaches completed the training period; two did not, one because of personal reasons, and the other due to limited time available to devote to ABC.

Parent coaches rated satisfaction with each type of supervision on a 4-point scale adapted from the Satisfaction with Supervision Questionnaire (Ladany, Hill, Corbett, & Nutt, 1996), with higher values representing greater satisfaction. Overall, coaches were satisfied with both clinical supervision ($M = 3.48$, $SD = .88$) and fidelity-focused supervision ($M = 3.60$, $SD = .71$). Parent coaches also rated their working alliance with supervisors on a 7-point scale adapted from the Working Alliance Inventory (Horvath & Greenberg, 1989), with higher values representing stronger working alliances. Coaches tended to report strong working alliances with both clinical supervisors ($M = 6.05$, $SD = 1.25$) and fidelity-focused supervisors ($M = 6.23$, $SD = 1.11$).

Several cultural translations of ABC were allowed to occur naturally. For example, some parent coaches were called "aunty" by families; in Hawaii, "aunty" is a term of respect for an elder that is rooted in a sense of a community family that

extends beyond bloodlines (Ito, 1999; Okamura, 1980). Another cultural translation involved incorporating local knowledge and culture into the intervention. One parent coach reported using the “Menehune man,” which she described as a “scary little mischievous thing,” similar to an elf or troll, as an example of a way that parents’ joking threats (e.g., “I’m going to let the Menehune man get you”) could be frightening to a child. As another example, many parent coaches chose songs by Hawaiian musicians for the background music of the video montages that are presented to families in session 10. Thus, although several cultural translations to ABC occurred, they did not alter the active components of the intervention.

Participants

Nine parent coaches and 78 families participated in ABC during the training year. All parent coaches were female. Most (8 of 9) had master’s degrees, and one parent coach reported attending but not graduating from college. Three parent coaches (33%) were white/non-Hispanic, 3 (33%) were Asian American, 1 (11%) was Native Hawaiian, and 2 (22%) were multi-racial. Parent coaches ranged from 27 to 56 years old ($M = 39.1$, $SD = 10.2$), and worked at a variety of public and private agencies across several islands in Hawaii. They reported an average of 9.9 years ($SD = 5.2$) of experience in the social work field, with an average of 4.3 years ($SD = 3.6$) in their current jobs.

Seventy-eight families were enrolled and 57 families (73%) completed the intervention during the training year. Most ($n = 66$, 85%) primary caregivers participating in the intervention were birth mothers, with 3 (4%) birth fathers and 9 (12%) foster mothers identified as the primary caregiver. Several ($n = 19$, 24%) cases identified additional caregivers as participating in ABC; in most cases ($n = 13$, 65%), the child’s birth father was identified as a secondary caregiver, but occasionally the birth mother ($n = 4$, 20%), foster father ($n = 1$, 5%) or another biological relative, such as a grandparent ($n = 2$, 10%) was identified. For the purposes of this study, when more than one parent participated in ABC, only post-treatment assessment data from the primary caregiver were used. When families participated in ABC more than once ($n = 3$), only data from their first round of participation were included. Of the 57 families that completed intervention, post-treatment data were available for 56; data were missing for 1 family due to camera malfunction.

Reason for referral was assessed with an open-ended question answered by parent coaches. Parent coaches gave varying amounts of information and descriptions about cases in response to this question; to characterize the sample, responses were coded. A number of families ($n = 29$, 37%) were referred because of Child Protective Services or Child Welfare Services involvement. Other families were referred ($n = 21$, 27%) as the result of observed harsh or neglectful parenting. Reasons for referral that did not fit in the previous two categories ($n = 29$, 36%) included: referrals by other service providers (e.g., home visitors); observed difficulties with ABC-targeted behavior, particularly providing nurturance; past separations between the parent and child; and self-referral.

Primary caregivers were, on average, 28.6 ($SD = 6.8$) years of age, ranging from 17 to 46. Half ($n = 39$, 50%) were of mixed racial background, and 10 (13%) were white/non-Hispanic, 4 (5%) white/Hispanic, 1 (1%) African American, 7 (9%) Asian American, 8 (10%) Native Hawaiian, and 5 (6%) other Pacific Islander, with data missing for 4 (5%) caregivers. Relatively few ($n = 21$, 27%) caregivers were single, with 38 (49%) living in two adult households, and 18 (23%) living in households with 3 or more adults, with data missing for 1 (1%) family. About half ($n = 40$, 51%) of the families had multiple children in the home, whereas half ($n = 36$, 46%) had only the target child; demographic data were missing for 2 families.

On average, children were 12.2 ($SD = 7.4$) months of age when enrolled in ABC, ranging from 2 to 27 months. Most children ($n = 57$, 73%) had mixed racial backgrounds, and 5 (6%) were white/non-Hispanic, 2 (3%) white/Hispanic, 1 (1%) African American, 1 (1%) Asian American, 7 (9%) Native Hawaiian, and 2 (3%) other Pacific Islander, with data missing for 3 (4%) children.

Procedure

Prior to beginning session 1, parent coaches filmed a semi-structured play assessment with the parent and child. Parent coaches asked the parent to place the child in a child seat, and provided three toys: a rattle, a squeaking toy, and a set of stacking cups. Parents were instructed to interact with their children as they normally would, and the interaction was filmed for 9 minutes. After the play assessment had been conducted, parent coaches began the intervention with the family. Parent coaches implemented ten sessions of ABC, typically conducting sessions on a weekly basis, and videotaping sessions for the purposes of video feedback and supervision. After the final session of intervention, the play assessment was re-administered, using the same protocol, typically on the same day as session 10. Parent coaches sent play assessment videos to the University of Delaware, where the videos were coded by undergraduate coders who were unaware of hypotheses. Parent coaches also sent ABC session videos to the University of Delaware, where the videos were coded for fidelity-focused supervision by undergraduate coders. At the end of the training year, parent coaches completed questionnaires and reported demographic information about themselves and each of their cases. They received a \$50 gift card for their participation in completing the questionnaires. The University’s IRB considered the research exempt because we used archived data that had been collected and coded for purposes of program evaluation and clinical supervision, and which were subsequently de-identified.

Measures

Parent Behavior. Parent behavior during the play assessment was coded using scales adapted from the NICHD Observational Record of the Caregiving Environment (ORCE; NICHD ECCRN, 1996). Although NICHD studies often use the ORCE to

create a composite construct of caregiver sensitivity, we retained separate scales to assess distinct parent behavior targets of ABC. The behavior target of following the lead was assessed by the ORCE sensitivity/responsiveness to non-distress scale. The behavior target of delight was assessed using the ORCE positive regard scale. The behavior target of reduced intrusive behavior was assessed using the ORCE intrusiveness scale. To simplify interpretation, from here on, we refer to these scales as: following the lead, delight, and intrusiveness. We expanded the 4-point ORCE scales to 5-point scales to allow greater variability in ratings. Coders were required to pass a reliability set that included play assessments with children from ages 0 to 5, in various caregiving contexts, including high-risk birth parents, foster caregivers, internationally adopting parents, and low-risk biological parents. For this sample, 4 coders completed ratings, with 15% of play assessments double-coded. Reliability ranged from fair to excellent across scales, with one-way, random effects, single-measures ICCs of .53 for delight, .65 for following the lead, and .85 for intrusiveness. A one-way, random effects ICC is appropriate when a variety of coder pairs rate a subset of the sample (Shrout & Fleiss, 1979), and ICCs in the range of .40–.59 are considered fair, .60–.74 considered good, and above .75 considered excellent (Cicchetti & Sparrow, 1981). Pre- and post-treatment play assessments were coded by separate coders.

ABC Fidelity. In ABC, treatment fidelity is conceptualized as the frequency and quality of parent coaches' in the moment feedback to parents. The first element of feedback quality is whether comments are on-target, that is, relevant and appropriate, as a response to the parent's behavior. Second, comments should provide the parent with at least one of three components of information: a specific description of the parent's behavior (e.g., "He banged the blocks together, and you banged some blocks, too"), the intervention target the behavior corresponds with (e.g., "That's such a good example of following his lead"), and a child outcome the behavior is linked to (e.g., "That teaches him he has an effect on his world").

The in the moment fidelity coding system is a bipartite system in which parent behaviors relevant to the targets of the intervention are first coded, and then parent coach responses to each of these behaviors are also coded. Each time a relevant parent behavior is observed, the system is triggered (i.e., parent behavior and parent coach feedback are coded). Characteristics of in the moment feedback that are coded include: (a) on/off target: whether a comment is appropriately matched to the parent's behavior and does not drift beyond the scope of the intervention targets, and (b) the number of information components included in a comment. Using these comment characteristics, the Excel coding spreadsheet automatically calculates summary scores for the video clip, including frequency of various parent behaviors, as well as frequency of on-target comments, which is the primary marker of fidelity examined in the results.

Forty videos used to assess fidelity in the current study were double coded to assess interrater reliability. Reliability was excellent for the primary marker of fidelity, frequency of on-target in the moment comments, with a one-way, random effects ICC of .94. Reliability was also assessed for parent behavior frequencies, which were used in intent-to-treat analyses, with ICCs of .93 for following the lead, .85 for delighting, and .68 for intrusive behaviors.

Results

Fidelity and Certification of Parent Coaches

ABC fidelity data of Hawaiian parent coaches were compared to criteria for parent coach certification. Specifically, coaches are expected to make, on average, 1 on-target comment per minute. This prescribed rate of commenting has been demonstrated by parent coaches conducting ABC in randomized clinical trials; for example, a coach in a single-subject case study made, on average, 1.27 on-target comments per minute after 6 months of training (Meade, Dozier, & Bernard, 2014). On average, Hawaiian parent coaches made .91 on-target comments per minute in their sessions, which was not significantly different, in a one-sample t-test, from the prescribed 1 on-target comment per minute, $t(8) = -.61, ns$.

The training and supervision process was successful in helping most parent coaches reach ABC certification requirements by the end of the training year. For certification, parent coaches must meet the following requirements in at least 7 of their most recent 10 sessions: making at least 1 on target comment per minute, having at least 80% of comments be on-target, and having at least 1 information component per comment, on average. Of the 7 parent coaches who completed the training year, 6 decided to pursue certification and met the certification requirements (5 by the end of the training year, and one within 3 additional months). One parent coach decided not to pursue certification for personal reasons. There were no statistically significant differences between certified and uncertified coaches in their ratings of supervision or organizational support. However, parent coaches who were later certified had lower levels of case dropout, $t(7) = 4.88, p < .01$, and higher frequency of on-target comments, $t(5.92) = 4.58, p < .01$, than parent coaches who were not certified at the end of the training period. Uncertified parent coaches attended fewer fidelity-focused supervision sessions ($M = 3.7, SD = 6.4$) than certified coaches ($M = 30.2, SD = 6.1$), $t(7) = 6.09, p < .001$. However, the difference in number of clinical supervision sessions ($M = 20.3$ for uncertified coaches vs. $M = 44.7$ for certified coaches) did not reach statistical significance ($p > .10$). Descriptive data regarding individual parent coaches, as well as comparisons between certified and uncertified parent coaches are presented in Table 1.

Change in Parent Behavior

Changes in parent behavior were analyzed using Hierarchical Linear Modeling software (HLM; Raudenbush & Bryk, 2002). This analytic approach accounts for the nested structure of cases within parent coaches, and the fact that the cases of the

Table 1
Retention, fidelity and certification among parent coaches.

Coach	# Cases seen	Cases that completed ABC (% retained)	On-target comments/minute (SD)	Certified
1	11	7 (64)	.99	Yes
2	22	16 (73)	.80	Yes
3	9	8 (89)	1.03	Yes
4	6	6 (100)	1.43	Yes
5	9	9 (100)	.90	Yes
6	2	1 (50)	.43	No
7	8	1 (13)	.56	No
8	2	0 (0)	.42	No
9	9	9 (100)	1.66	Yes
Certified coaches	66	55 (83)	1.13 (.34)	–
Uncertified coaches	12	2 (17)	.47 (.08)	–

Table 2
Estimated average changes in parent behavior from pre- to post-intervention.

Parent behavior scale	γ_{00}	SE	t-ratio	p-value
Following the lead	1.03	.21	4.81	.002
Delight	.41	.17	2.41	.047
Intrusiveness	–1.32	.20	–6.42	<.001

Note. γ_{00} represents estimated average difference scores, accounting for an unbalanced number of cases within parent coach. T- and p-values reflect tests of whether the change score is significantly different from 0.

same parent coach are likely to be more similar to each other than to cases of different parent coaches. To measure parent behavior change, difference scores were calculated for each case by subtracting the pre-intervention ratings of following the lead, delight, and intrusiveness from the corresponding post-intervention scores. Difference scores were then entered into HLM equations that lacked any predictor variables, to test whether the average expected change score (i.e., model intercept) was significantly different from 0. Three models were specified, testing change in (1) following the lead, (2) delight, and (3) intrusiveness. Models followed the general following form:

$$\text{Behavior Difference}_{ij} = \gamma_{00} + u_{0j} + r_{ij}$$

in which γ_{00} , the intercept, represents the estimated average amount of behavior change; u_{0j} represents the parent coach-level error term; and r_{ij} represents the parent-level error term. Including a parent coach-level error term accounted for the nested structure of the data while testing whether parent behavior change scores differed from 0.

As shown in Table 2 and graphed in Fig. 1, statistically significant changes were observed on each parent behavior scale. Following the lead increased by about 1.0 points from pre- to post-treatment, and delight increased by about .4 points, on 5-point scales. Intrusiveness decreased by about 1.3 points on a 5-point scale from pre- to post-treatment.

Benchmarking. Table 3 presents effect sizes of behavior change found in this study, compared with effect sizes from two randomized clinical trials of ABC (Bernard, Yarger, Meade, & Dozier, 2015; Dozier and Infant Caregiver Project, 2015). Effect sizes from the current study were comparable to those found in randomized clinical trials of ABC.

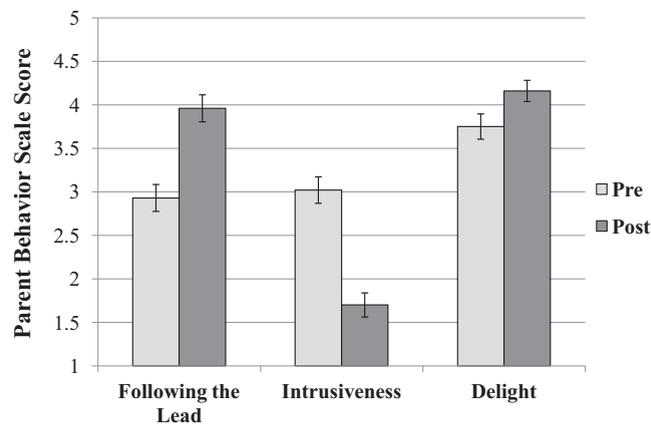


Fig. 1. Average levels of parent behaviors, coded from a videotaped semi-structured play task, pre- and post-intervention. Between the two play assessments, parents participated in 10 weekly sessions of ABC. Error bars do not account for the nested structure of the data, and are thus slight underestimates.

Table 3
Benchmarking comparisons of parent behavior change effect sizes.

	Community sample Hawaii	Internationally adopting parents	Foster parents
Following the lead	.89	.49	.75
Delight	.41	.41	.13
Intrusiveness	−1.21	−.35	−.71

Note. This table presents effect sizes (Cohen's d , $d = \text{Post-Int Mean} - \text{Pre-Int Mean} / (\text{pooled SD})$). In the data from RCTs of internationally adopting and foster parents, only data from the group receiving ABC were used.

Table 4
Comparisons between treatment dropouts and matched comparison group in parent behavior frequencies observed in 5-minute fidelity coding.

Parent behavior	Dropouts session 1	Dropouts last session	Comparison session 1	Comparison yoked session
Following the lead	5.19 (3.74)	7.52 (5.46)	5.57 (3.06)	7.86 (6.97)
Delighting	2.90 (2.32)	3.05 (2.36)	2.38 (1.40)	3.24 (2.66)
Intrusive behavior	3.05 (3.47)	3.19 (2.94)	3.48 (2.87)	3.52 (2.63)

Note. Mean (SD). No differences in behavioral frequencies between the dropout group and comparison group were identified at session 1 or the last/yoked session. Although a 2×2 ANOVA showed that both groups increased in following the lead across time, within-group paired t -tests did not reach significance for dropouts, $t(20) = -1.95$, $p = .066$, or the comparison group, $t(20) = -1.44$, $p = .166$.

Dropout and Intent-To-Treat Analyses

Twenty-one families (27% of the families enrolled) dropped out of treatment prior to session 10. Families who dropped out of treatment were not statistically different from those who completed treatment in their demographic characteristics, including race, parent age, family structure, and reason for referral. Dropouts also had similar scores on the pre-intervention parent behavior measure. A table comparing demographic and parent behavior characteristics of dropouts and treatment completers is available from the authors upon request. Families who dropped out of treatment completed an average of 3.8 ($SD = 2.0$, range 1 to 9) sessions prior to dropout.

To conduct intent-to-treat analyses, we used parent behavioral data from the fidelity coding observations from intervention sessions, including frequency counts of parents' following the lead, delighting, and intrusive behaviors. To examine whether parent behavior improved prior to dropping out, and whether improvement was equivalent to behavioral change made by ABC completers, we matched each family that dropped out with a comparison family that completed treatment. Matches were made within parent coaches' caseloads, when possible, and maximizing equivalence of pre-intervention following the lead ratings from pre-intervention play assessments. Analyses examined dropouts' behavioral data from session 1 and the final session prior to dropout, compared to the same sessions in the yoked families. Thus, analyses examined how change observed in families that dropped out compared with change observed in families that completed intervention, up through the time of dropout. Change in yoked families was *not* assessed across all 10 sessions of intervention.

Table 4 compares the frequency of parental following the lead, delight, and intrusive behaviors during 5-minute video clips of sessions. In both session 1, and the final/yoked session, there were no differences between dropouts and comparisons in the frequency of targeted behavior exhibited by parents. As shown in Table 4 and illustrated in Fig. 2, dropouts' frequency of

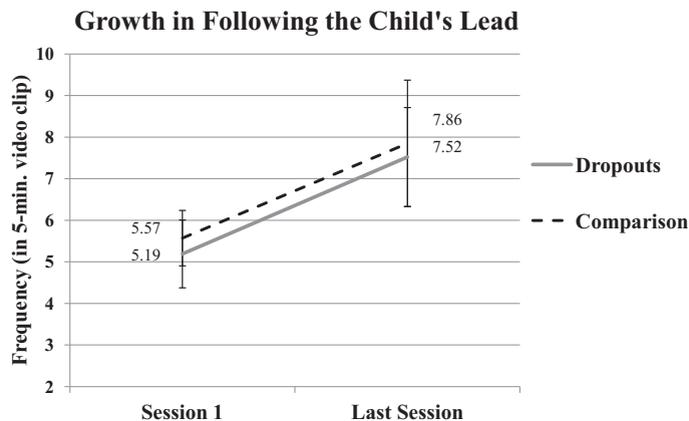


Fig. 2. Average levels of parent following the child's lead, observed in-session, in session 1 and in the final session prior to dropout (which occurred, on average, after 3.8 sessions). The 22 families that dropped out were matched with 22 comparison families on the basis of ABC parent coach and pre-intervention following the lead score from the play assessment. Comparison families' "last session" data is not from their actual last sessions (session 10), but instead is matched to the dropout families' final sessions.

following the lead increased from session 1 to the final session prior to dropout. Comparison parents' frequency of following the lead increased at a similar rate between session 1 and the session yoked to dropouts' discontinuation of participation. A group x time analysis of variance showed a main effect of time on following the lead, $F(1,40) = 5.39$, $p < .05$, but no effect of group and no group x time interaction. Dropouts and comparison parents did not demonstrate increases in delight or decreases in intrusiveness during the same time period.

Discussion

This study demonstrated evidence for the transportability of the Attachment and Biobehavioral Catch-up intervention to community agencies. Improvement was observed in parent behavior in a parent–child interaction task coded by independent research staff. Specifically, ratings of parental following the lead and delight increased, and ratings of parental intrusiveness decreased, from pre- to post-treatment. The amount of change observed (as measured by effect size) was comparable to change demonstrated in randomized controlled trials of ABC.

These results have high public health significance. Parental following the lead has been linked to positive regulatory outcomes, such as attention span at one year of age (Bornstein & Tamis-LeMonda, 1997) and self-control at age 2 (Feldman et al., 1999). Parental following the lead may also buffer children in high-risk environments from telomere shortening, a marker of cellular aging (Asok, Bernard, Roth, Rosen, & Dozier, 2013). In contrast, parental intrusiveness has been linked to negative socioemotional and regulatory outcomes, including poor emotion regulation at age 2 (Cabrera, Shannon, & Tamis-LeMonda, 2007), and internalizing and externalizing behavior between 18 months and 3 years (Frosch & Mangelsdorf, 2001; Propper, Willoughby, Halpern, Carbone, & Cox, 2007). Thus, ABC enhances parent behavior that is associated with positive child outcomes, and decreases parent behavior that is associated with negative child outcomes. Further, not only are these effects feasible in the laboratory that developed the ABC intervention, they are also seen at implementation sites trained in ABC. These results support the viability of successful implementation of the ABC intervention in community agencies.

In addition to the overall positive outcome on families, strong parent coach effects must be acknowledged. Three of the nine parent coaches were not certified, and these parent coaches had lower treatment fidelity and higher rates of family dropout than other parent coaches. These parent coaches also showed lower engagement in supervision than certified parent coaches. At this time, we cannot tease apart the links between participation in supervision, quality of treatment delivery with families, and rates of case dropout; however, these constructs appeared to cluster together in the current study. These observations are consistent with prior findings that the amount of supervision received by home visitors predicted retention of families in intervention (McGuigan, Katzev, & Pratt, 2003). In our study, supervision was equally available to all parent coaches, so it is likely that variables such as parent coach engagement/motivation and agency support influenced these processes.

Although there were several families that dropped out of treatment, retention (73%) was comparable to typical rates of dropout in community mental health settings and home-visiting programs (Gomby, Culross, & Behrman, 1999; Kazdin, 1996). Further, retention was higher (83%) among the families seen by parent coaches who were later certified than those who were not, suggesting that when treatment was implemented with greater fidelity (i.e., more frequent in the moment feedback), dropout was lower. Meeting families in their own homes may enhance treatment accessibility and thereby reduce dropout (Henggeler, Pickrel, Brondino, & Crouch, 1996). Additionally, although a parenting intervention could be threatening to parents, we believe that ABC parent coaches' frequent use of in the moment feedback creates an environment in which parents feel supported and efficacious, reducing dropout due to feelings of being judged or negatively evaluated. Many parent coaches in the current study spontaneously described ABC as "strengths based," a characteristic which Katz, Lederman, and Osofsky (2011) argue increases engagement in parenting programs among child welfare populations. Further, recent findings suggest that clinicians' frequency of responsive coaching (a technique similar to in the moment feedback) is linked to higher treatment retention in Parent–Child Interaction Therapy (Barnett et al., 2015), providing preliminary support for this idea. Importantly, families who dropped out of treatment were not found to differ from families who completed treatment, suggesting that families with a range of characteristics and backgrounds can be retained in and can benefit from ABC. Additionally, intent-to-treat analyses suggested that prior to dropout, parents who dropped out of treatment were improving at a similar rate to those who completed treatment.

One strength of the study was the cultural, racial and ethnic diversity of the families and parent coaches. In a randomized clinical trial of ABC with children living with their CPS-involved birth parents, children and caregivers were primarily African American (Bernard et al., 2012). In the present sample, most children were multi-racial, and many had Native Hawaiian, other Pacific Islander, and Asian backgrounds. The parent coaches in this sample were also diverse, with European American, Asian American, Native Hawaiian and multi-racial backgrounds. These results expand the populations with whom ABC has been demonstrated effective.

Some limitations of the study are common to community-based treatment research. There was no comparison condition or randomization to groups. In addition, there was no measurement of distal child outcomes, as collection of proximal parent outcomes was more practical and presented less of a burden for both families and parent coaches than assessment of more distal outcomes. Another limitation was the small sample size of parent coaches.

Overall, this study demonstrated the success of ABC when conducted by community parent coaches during their first year of implementation. Only one of the nine parent coaches failed to complete intervention with at least one family, and on average, parent coaches worked with 8.7 families, and completed ABC with 6.3 of these families, during the year.

The number of families who received intervention, the acceptable retention rate, and the observed changes in parenting behaviors, speak to the efficacy of the ABC training methods. In future work, we plan to study the process of parent coach training at dissemination sites, and specifically the effects of fidelity-focused supervision. Of note, it was clear in this study that not all of the ABC trainees benefitted from training and supervision equally, with a few parent coaches showing lower fidelity and retention of families. It will be important to identify what factors may influence parent coaches' ability to achieve ABC fidelity, such as agency support, engagement/motivation, or natural ability and willingness to give in the moment feedback. We also plan to study the continuing performance of community parent coaches, examining whether parent behavioral improvement and low dropout rates are maintained when parent coaches are no longer engaged in weekly supervision.

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