

**Is Parent Behavior Change Contingent on  
Parent Coach Commenting in the ABC Intervention?:  
Preliminary Results**

by

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## **ABSTRACT**

Foster children in the United States are vulnerable to psychological, physiological, and behavioral problems (Dozier, et al., 2006; Thompson & Calkins, 1996). The Attachment and Biobehavioral Catch- up (ABC) intervention was designed to address these problems proactively in at-risk children. The short-term intervention targets following the lead, delight, nurturance, and non-frightening parent behaviors. A unique component of the ABC intervention is its use of parent coach in vivo feedback, called In the Moment (ITM) comments, to the parent. Parent coaches give in the moment comments to either encourage or redirect parent behavior to be positive. In this study, we examined whether parent behavior change is contingent on ITM comments rather than chance. We explored our hypothesis that parent behavior change was contingent on ITM comments by using a microanalytic coding system. A total of 51 parent-child dyads were coded. Results demonstrated that contingent links existed between in the moment comments regarding delight and subsequent delighted parent behavior.

## **Chapter 1**

### **INTRODUCTION**

#### **ABC intervention**

Children in foster care are vulnerable to psychological and physiological disturbances during development, as they often experience abuse, neglect, and disruptions in caregiving (Dozier, et al., 2006; Thompson & Calkins, 1996). Early life stress makes young children especially at risk, as they are susceptible to long-lasting effects, including poor behavioral and biological regulation (Gunnar & Vazquez, 2001). Foster children are at a greater risk for developing a disorganized attachment with their caregiver than biological children (Bernard et al., 2012; Dozier et al., 2006). Problematic outcomes for maltreated children can include misbehaving in school, demonstrating unhealthy behaviors, and struggling with emotion regulation (Gilbert et al., 2009).

The Attachment and Biobehavioral Catch-up (ABC) intervention is a preventative intervention designed to address these risks by improving parent behaviors. The short-term intervention targets the parent behaviors of following the lead with delight, nurturance, and non-frightening behavior. These behaviors are targeted in an effort to improve children's attachment and hormonal outcomes (Bernard et al., 2012; Bernard, Dozier, Bick & Gordon, 2013). ABC has been found efficacious in randomized clinical trials with children who faced early life adversity. Children whose parents have received the ABC intervention have been found to have



more secure attachments and less disorganized attachments than children whose parents received a control intervention (Bernard et al., 2012). Additionally, the ABC has positively affected the regulation of cortisol, a stress hormone, in children (Bernard, Dozier, Bick, & Gordon, 2014; Bernard, Hostinar, & Dozier, 2014; Dozier et al., 2006).

The duration of the ABC intervention is one hour, once a week, and for ten weeks. The “parent coach,” a clinician, visits the family’s home to deliver manual content, lead structured play activities, and provide in the moment feedback to parents. During sessions, parent coaches make comments about targeted behaviors (following the lead, nurturance, delight, and frightening behaviors). ABC is thought to improve child outcomes by encouraging parent following the child’s lead and nurturance, and discouraging parent intrusiveness and frightening behavior. Following the lead refers to the parent responding to the child’s cues. Following the lead behaviors include parent mimicking, commenting, and appropriately responding to the child’s bid. A parent banging blocks together when the child does is an example of following the lead. Simply accepting a toy when a child hands it to the parent or repeating what the child says are examples of following the lead, also. Nurturance is a parent’s response to child distress or child bid for affection. Being there for the child, holding the child, and reassuring the child are positive examples of nurturance. Asking the child, “Are you ok?” when he or she falls is another instance of nurturing parenting. Intrusive behaviors (i.e., correcting the child, dictating the direction of play, or tickling) and frightening behaviors that overwhelm the child are negative parent behaviors that the parent coach would redirect through commenting.

### **In the moment as a unique ABC intervention component**

Parent behaviors are encouraged or discouraged through the use of In-The-Moment (ITM) comments made by the parent coach. ITM comments are proposed as the most important component of the ABC intervention. ITM comments are comments made by parent coaches when they see a parent demonstrate a target behavior (i.e., nurturance, following the lead, delight, or frightening behavior). For a positive target behavior, the ITM comment is positive and encourages the parent to continue the behavior. For example, “She said ‘car’ and you said ‘car.’ Repeating what she says is great following her lead,” is an appropriate parent coach comment to encourage the positive parent behavior of following the lead. When a parent is observed behaving in a way that is at odds with intervention targets, the ITM comment is used as a mechanism to point out the behavior and suggest ways to change it to a positive behavior. In the instance when a parent is dictating the direction of play a parent coach could comment, “So you want to stack the blocks right now, but he is happy just hitting the blocks together. You can join his game by doing the same thing.” This comment points out the parents not following the lead behavior and suggests a way to make it following the lead. Both positive and negative comments point out specific behaviors to the parent to increase their understanding and demonstration of the target behaviors. Comments reiterate the manual content and reinforce the positive parent behaviors.

Parent coaches use a combination of three comment components to encourage or redirect parent behaviors. These components include: labeling the target behavior (e.g., “Good following his lead”), describing the parent-child interaction (e.g., “He picked up a block and you picked up a block”), and stating the long-term outcome for the child (e.g., “This will let him know he has an effect on the world”). Current

evidence shows that higher parent coach comment frequency and percentage of on-target comments predicts greater parent behavior change (Meade & Dozier, 2012; Meade & Dozier, 2013).

Immediate feedback is theorized to allow parents to better learn the target behaviors. Parents comprehend the target behaviors by incorporating parent coach feedback into their ongoing behaviors. For example, if a parent coach says, “Great following the lead by opening your mouth when she opens her mouth,” the parent will feel confident that his or her behavior is beneficial to the child and be more likely to continue engaging in similar behavior. Also, he or she will better understand the intervention target of “following the lead” because the parent coach labeled the behavior in her comment. Creating a supportive environment for the parent helps parents feel confident about their interactions with their child.

### **Commenting in other interventions**

In the moment commenting is one style of in vivo feedback, a technique implemented in several successful interventions. The behavioral parent training intervention, Parent Child Interaction Therapy (PCIT), uses in vivo feedback similar to ABC. As in ABC, a PCIT therapist provides immediate feedback to a parent while the parent plays with his or her child. Both ABC and PCIT interventions strive to encourage child-centered interactions and discourage intrusive, parent-led play behaviors. However, the therapist in PCIT watches the parent-child interaction through a two-way mirror. The therapist’s feedback to the parent is given via earpiece microphone (Brinkmeyer & Eyberg, 2003). Regardless of their execution differences, both ABC and PCIT have shown significant positive differences in parent behavior.

These results support the importance of in vivo feedback during parent-child intervention (Embry & Biglan, 2008).

In vivo feedback is an important coaching approach in changing parent behaviors. In a recent PCIT study, parent-child dyads were randomly assigned to a coaching or non-coaching group. Parents in the coaching groups received in vivo feedback from a PCIT therapist and showed significant improvement in skill, compared to the control groups' parents (Shanley & Niec, 2010). A recent meta-analysis suggests this significant improvement in treatment effects is a result of requiring parents to practice behaviors in-session with their children (Kaminski, Valle, Filene, & Boyle, 2008). In-session parent behavior practice and in vivo feedback likely work together to reiterate intervention targets and increase parent understanding.

Ability to be an effective parent coach or therapist in ABC and PCIT is a key factor in finding significant parent behavior change. Findings from the PCIT study suggest that the ability of the therapist determined the parents' skill acquisition beyond baseline (Shanley & Niec, 2010). In a follow-up study, the Therapist-Parent Interaction Coding System (TPICS), a PCIT measure of therapists' in vivo feedback, was evaluated. TPICS coded for variety, style, and frequency in the therapist's coaching. In vivo coaching was a mediator of parent change and directive coaching, which is teaching the definitions of the intervention's target behaviors was not. These results infer the TPICS to be a strong measure of PCIT coaching, as it captures a range of coaching techniques and ability (Barnett et al., 2013). The ITM coding sheet summarizes ABC parent coach commenting similarly to how the TPICS summarizes PCIT coaching. Parent behavior and parent coach comments are transcribed on the

ITM coding sheet to provide summary statistics of parent coach comment frequency and content during the clip, thus providing fidelity metrics.

### **Importance of second-by-second coding**

Exploring temporal contingent patterns between parent coach comments and parent behavior is essential to learning more about the effectiveness of ITM comments. Current evidence from the lab shows that higher parent coach comment frequency and percentage of on-target comments predicts greater parent behavior change (Meade & Dozier, 2012, 2013). However, these changes were demonstrated across a number of sessions, rather than immediately, within session. Because alternative hypotheses are possible (e.g., parent coaches who make more comments also build better rapport with families, and the rapport is what helps parents to change), it is critical to examine the relationship between comments and behavior at a second-by-second level. Contingency analyses that provide evidence that in the moment feedback is an active ingredient of intervention would inform ABC training, supervision, and dissemination efforts.

The relationship between parent coach comments and parent behavior was analyzed using sequential analyses (Yoder & Tapp, 2004). Sequential analysis has previously been used with parent-child dyads to measure whether an antecedent parent behavior increased the probability of a child target behavior (Brigham et al., 2010). In the present study, sequential analyses were used to examine whether the antecedent behavior (i.e., parent coach comment) increased or decreased the probability of the target behavior (i.e., parent behavior).

### **Current study**

Confirming contingent links at the microanalytic level between parent coach comments and parents' subsequent positive behaviors would further validate the ITM feedback approach. In the current study, I adapted the ITM coding system to a second-by-second coding system. Five-minute clips of intervention sessions with 51 cases conducted by 11 parent coaches were coded with microanalytic coding software. Analyses examined whether comments increased likelihood of subsequent positive parent behaviors. I hypothesized that significant change in parent behavior is contingent on parent coach ITM commenting, and that these changes can be seen at the microanalytic level.

## **Chapter 2**

### **METHODS**

#### **Participants**

Participants in the current study were a sample participating in an ongoing, randomized clinical trial of Attachment and Biobehavioral Catch-up (ABC) for toddlers in foster care. Families were recruited for the larger study through Delaware's Department of Family Services, and were randomized to receive either Attachment Biobehavioral Catch-up (ABC) or a control intervention. The families in the current study were selected from families who were randomized to ABC and completed the intervention.

**Families.** Participants included 51 foster parent-child dyads. Children ranged in age from 1.1 to 3.3 years old ( $M = 2.2$ ,  $SD = .5$  years). Thirty-two children were male (63%) and 19 were female. Foster parents included 46 women and 5 men, ranging in age from 24.3 to 80.8 ( $M = 46.6$ ,  $SD = 11.49$  years). Forty-one out of 51 families were foster parent-child dyads matched in ethnicity and 10 were not; 24 dyads were matched in gender and 27 were not. Some foster families included more than one child enrolled in the intervention; in these cases, a target child was selected based on age, always selecting the older child.

**Parent coaches.** Eleven parent coaches were involved in the current study. Ten parent coaches were female and one was male. Prior to administering the Attachment and Biobehavioral Catch-up intervention (ABC), parent coaches were

trained by the developer of the intervention, Dr. Mary Dozier, and received ongoing clinical supervision from Dr. Dozier and Dr. Caroline Roben.

### **Measure**

The measure used in the current study was adapted from the In the Moment fidelity coding system developed by Meade and Dozier (2012). The coding system was adapted for micro-level coding software, Noldus Observer XT, to capture moment-by-moment contingencies between comments and behaviors.

*Targeted Parent Behaviors.* ABC-targeted parent behaviors that were coded include: following the lead, not following the lead, nurturance, non-nurturance, delight, and frightening behaviors.

Following the lead, nurturance, and delight are positive behaviors. Following the lead represents the parent responding synchronously or contingently to the child's bid. Parents can follow the lead by playing the child's game, regardless of correctness, repeating the child, or mimicking the child's behavior. Following the lead, for example, could be a parent tapping blocks together after the child does. Nurturance is a parent's responding in a soothing or reassuring way to the child's distress or bid for affection. Picking up a child when the child is crying and asking if he is ok is an example of nurturance. A successful act of nurturance lets the child know that his caregiver is there for him. Delight is a parent's genuine, positive regard for their child. Examples of delight include parent smiling and laughing.

Not following the lead and non-nurturance are negative behaviors. Not following the lead is defined as a parent interacting with his or her child in a non-synchronous way. Examples of not following the lead include parent teaching, correcting, or acting intrusively during interaction. Non-nurturance, on the other hand,



consists of a failure to respond to, or dismissal of, the child's distress. For example, ignoring the child's crying, telling the child he is ok, or suggesting distractions from distress are parent displays of non-nurturance.

Every target behavior was coded using a corresponding marker variable. A marker variable is a clickable component on Noldus to start/stop coding behaviors. As a target behavior began, the behavior marker was turned on; when the behavior concluded, the target marker was turned off. For example, when a coder saw an instance of following the lead, she pressed the "parent behavior following the lead" marker variable to start coding the behavior. When the behavior ended, she pressed the "parent behavior following the lead" marker to end it. Thus, start and stop times, as well as behavior duration, were recorded for every instance of target behaviors exhibited by parents. This independent coding of each target behavior allowed behaviors to overlap (e.g., parents could engage in following the lead and delight simultaneously). Of note, the parent's behavior toward non-target children was not coded.

*ITM Comments.* Every ITM comment made by a parent coach was coded using additional marker variables. First, a marker that a comment was made was coded. Next, each ITM comment was coded for accuracy (on or off-target) and number of components.

**On-target.** On-target ITM comments are consistent with and appropriately address the parent behavior. In contrast, off-target comments drift from ABC goals or provide incorrect information. For example, off-target comments may inappropriately praise negative behaviors, discuss a non-ABC-targeted parenting behavior (e.g.,

feeding, health concerns), or incorrectly label a behavior (e.g., calling a following the lead behavior “nurturance”).

*Differences from In The Moment Fidelity Coding.* There are distinct differences between the Noldus ITM coding system and the original ITM coding system from which it was adapted. The original ITM Fidelity coding system is also a micro-analytic approach to coding intervention- targeted behaviors and comments. Coders identify each parent behavior and parent coach comment as it occurs (Bernard, Meade, & Dozier, 2013). Description of parent behavior and transcription of parent coach comment are manually typed into the Excel-based coding sheet, indicating only a start time of the behavior and comment. Each behavior is coded on a separate line of the Excel spreadsheet. The spreadsheet produces certain summary statistics about comments, including the frequency of comments, the percentage of on-target comments, and the average number of comment components.

The Noldus- adapted ITM coding allows for more precise coding than the ITM fidelity coding. Multiple behaviors can be coded simultaneously in Noldus, as there can be more than one target-behavior switched “on” at a time. Indication of overlapping behaviors thus allowed for more precise coding. Also unique to the Noldus-adapted coding system was the ability to show comment and behavior overlap. For example, while a parent coach was making a comment, the original parent behavior could continue, or a new behavior could begin; in the original ITM coding system, this level of specificity of timing is not possible.

Further differences in the coding systems lie in the manner in which data are processed and summarized. Although the original ITM coding system is micro-analytic, the data extracted from the coding system consist of summary level statistics

(i.e., averages). In contrast, the data extracted from the Noldus-adapted coding system are rich, detailed logs of interaction that allow specifically for testing of micro-analytic hypotheses.

**Coding Procedure.** All intervention sessions for the 51 families were videotaped and uploaded to a secure server. A five-minute clip from each family's session 5 video was randomly selected for coding. One master coder coded clips from a total of 51 sessions.

### **Statistical analysis**

An important question to be explored is the temporal contingency patterns between parent coach comments and parent behaviors. Sequential analyses were used to examine these temporal relations (Yoder & Tapp 2004). Sequential analysis provides information about contingent patterns in sequenced events, and allows for the examination of whether an antecedent variable (e.g., a comment by the parent coach) increased or decreased the probability of a target variable (e.g., a parent behavior) occurring within a specified time period. It also provides information about whether the given variable caused a target variable to occur more or less often than expected by chance in that time frame. Time window sequential analysis, a form of sequential analysis, was utilized to examine the likelihood of one behavior being followed by another (Bakeman & Gottman, 1997; Bakeman & Quera, 1995; Yoder, Short-Meyerson, & Tapp, 2004). Time window sequential analysis utilizes a defined time window in relation to the given behavior. To calculate sequential dependencies between a given parent coach comment and a target parent behavior, expected transitional probabilities were compared with observed transitional probabilities. The expected transitional probabilities were calculated based on the total number of

possible event sequences and on the chance that one specific behavior would occur in the sequence.

## **Chapter 3**

### **RESULTS**

#### **Descriptive statistics**

Pearson correlations for the target variables are presented in Table 1. Significant positive correlations were found between parent behavior and parent coach commenting for following the lead, delight, and nurturance. These positive correlations were found when parent behavior and parent coach commenting was measured as the percentage of observation time, the total duration, the rate per minute, and the number of instances per minute. The only non-significant correlations were found between the total duration of the nurturance behavior and nurturance comment rate, total number of comments, and total percentage of observation.

These results suggest that, globally, the amount of parent coach commenting is linked to the amount parent behavior in sessions.

*Table 1. Pearson's correlations for the target variables*

		Total duration behavior	Rate per minute behavior	Total number of behavior	Percentage of observation duration behavior
Following the lead	Rate per minute	.79**	.65**	.61**	.84**
	Total number of comments	.82**	.63**	.63**	.86**
	Percentage of observation duration	.60**	.67**	.64**	.67**
Delight	Rate per minute	.42**	.58**	.54**	.51**
	Total number of comments	.46**	.53**	.59**	.48**
	Percentage of observation duration	.65**	.56**	.54**	.70**
Nurturance	Rate per minute	.43	.78**	.78**	.55**
	Total number of comments	.43	.78**	.78**	.55**
	Percentage of observation duration	.42	.62**	.62**	.58**
Not Following the lead	Rate per minute	.03	.45*	.45*	.09
	Total number of comments	.03	.46*	.48*	.09
	Percentage of observation duration	-.06	.26	.26	-.01

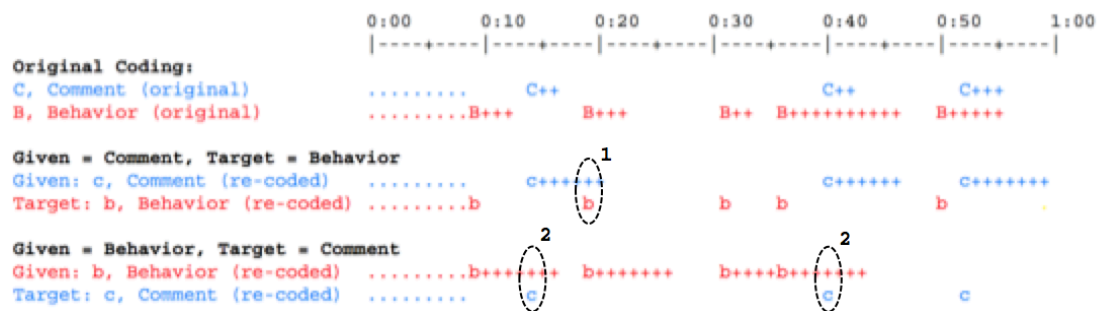
\*  $p < .05$ , \*\* $p < .01$

## Contingency analyses

Parent coach commenting and parent behavior contingency analyses were conducted using GSEQ 5.1, a software program that allows for the analyses of interaction sequences.

In order to examine the possible sequential relationship between parent coach comments and parent behaviors, a series of time-window contingency analyses were conducted. Analyses examined both the: a) commenting as a given and behavior as a target (e.g., a sequence of behavior following commenting), and b) behavior as a given and commenting as a target (e.g., a sequence of commenting following behavior). The sequential relationships were explored by investigating the probability of the target variable commencing during or in the 4 seconds following the end of the given variable. To accomplish this, the target variable was re-coded as a point variable at the commencement of the variable. The given variable was re-coded to include the entire duration of the variable, plus 4 additional seconds following the completion of the variable.

Figure 1. Original coding and re-coding of comments and behaviors.



The original coding is depicted in the first two lines of the figure. Letters show the beginning of a code, and addition signs indicate the duration of the code. For the situation in which comments were given and behaviors were the target, comments (the

given) were re-coded to include the entire duration plus an additional 4 seconds, and behavior (the target) was re-coded as a point variable indicating the commencement of the behavior. The number 1 on the figure indicates the one instance in which the start of behavior (the target) occurred during or in the four seconds following the end of a comment (given) in this one-minute sample. Similarly, for the situation in which behaviors were given and comments were the target, behaviors (the given) were re-coded to include the entire duration plus an additional 4 seconds, and comments (the target) were re-coded as a point variable indicating the commencement of the comment. The number 2 on the figure indicates the occasions during which the start of comments (the target) occurred during or in the four seconds following the end of a behavior (given) in this one-minute sample.

For these analyses, significant results indicate that the given variable either increased or decreased the probability that the target variable would occur during the given variable or in the four seconds after the given variable ended. A measure of sequential association (Odds Ratio) was calculated for each possible comment-behavior and behavior-comment contingency. Odds ratios provide an index of sequential association that demonstrate whether the observed probabilities differ significantly from the expected ones (Bakeman & Gottman, 1997; Yoder & Feurer, 2000). Odds ratio values greater than 1 indicate an increased sequential probability (i.e., it is more likely for one behavior to follow another), while values less than 1 indicate a decreased sequential probability.



Table 2. Contingency analyses results

	Parent Behavior to ITM Comment				ITM Comment to Parent Behavior			
	OR	Yule's Q	X <sup>2</sup>	p	OR	Yule's Q	X <sup>2</sup>	p
Delight→ Delight	Infinity	1	211.87	<.01**	3.57	.56	11.84	<.01**
FTL→ FTL	48.1	.96	504.98	<.01**	.73	-.16	2.63	.1
FTL and/or Delight→ FTL and/or Delight	18.73	.9	409.78	<.01**	.44	-.39	16.74	<.01**
FTL→ Not FTL	.17	-.72	3.93	.04	.71	-.17	.23	.64

\*  $p < .05$ , \*\*  $p < .01$

Comment – behavior sequence. The results for the contingency analyses, including Yules Q, odds ratio, chi-square, and p-value are summarized in Table 2. In examining whether parent behavior was significantly more or less likely than chance to occur during a parent coach comment or in the 4 seconds following the end of a comment, no significant contingent relationships between parent coach commenting and parent behavior were found. The relationship was found to be significant for delight, however. Results show that parent delight was about three and a half times more likely than chance to occur while a parent coach commented on delight, or in the 4 seconds after the parent coach finished the comments.

Behavior – comment sequence. In contrast to the comment- behavior sequence, significant contingent links between parent behavior and parent coach commenting were found for all parent behaviors. Although this relationship between parent behavior and subsequent parent coach comment is in lines with treatment objectives, it supports that parent coach comments are occurring during or immediately after the related parent behavior occurs. In other words, the parent coaches' comments occur at very specific time points during the session, and are linked to the specific ABC-oriented behaviors.

## **Chapter 4**

### **DISCUSSION**

Strong positive correlations emerged between parent coach commenting and parent behavior within 5-minute session clips, suggesting that higher levels of parent coach commenting is linked to higher levels of positive parent behaviors. This association was found for the rate of commenting and behaviors, as well as the total duration of time spent commenting and engaging in particular behaviors. Sequential analyses were conducted to examine whether there was a sequential link between commenting and behaviors. Besides delight, correlations between parent coach commenting and parent behaviors were not statistically significant, suggesting that the association between commenting and behavior might not be temporally bound. Instead, commenting may lead to increases in parent positive behaviors in general, but not in the time period during or immediately following the comment. In contrast to these findings, strong sequential links were found between parent behaviors and parent coach commenting. This provides evidence that the parent coaches are not simply commenting randomly throughout the session, but rather providing comments that are carefully targeted in both timing and topic.

#### **A comparison to previous studies**

Previous ABC studies explored the effect of ITM comments on parent behavior in the children adopted internationally and a population of high-risk families in Hawaii samples to find significant positive correlations between parent coach

commenting and parent behavior (Meade & Dozier, 2012; Meade, Bernard, & Dozier, 2014). This study with children in foster care replicated their results, which is exciting considering potential obstacles associated with the foster population. First, internationally adopting parents and biological parents may be more motivated than foster parents to change behavior (Dozier & Lindhiem, 2006). Also, foster parents may have gotten other parenting classes or workshops in the past, thus making them less open to new information included in ABC.

In addition to representing a new sample, the children in foster care participated in an adapted ABC intervention, with the adding of calming behavior. The positive significant correlations found in the Foster Toddler sample are important because they show that ITM comments are working successfully.

The summary statistics available through Noldus were different than summary statistics available in other ITM studies using the original coding system. Specifically, coding on Noldus allowed for the analyses of parent behavior and parent coach comment duration and percentage of observation. Parent behavior and parent coach commenting duration and percentage of observation are more strongly related than parent behavior and parent coach commenting rate and instances, which are the summary statistics available through the original ITM coding scheme. In the original ITM coding, one parent behavior may last 1-20 seconds, so parents who are better at following the lead may look similar to parents who go back and forth between following the lead and not following the lead, in terms of following the lead behavior counts and parent coach commenting rate. Also, a parent coach comment always breaks up an ongoing behavior into two different behaviors, so accounting for behavior duration is not possible on the original ITM coding sheet.

### **Clinician implications**

This study justifies the training and supervising of parent coaches, and ultimately, increases our confidence that ITM is an important mechanism of the ABC intervention. In ABC, parent coaches not only engage in clinical supervision, but also, ITM supervision, which consists of coding and commenting review, practice, and guidance. ITM supervisors meet with assigned parent coaches on a weekly basis to review a 5-minute clip from the parent coach's current ABC case. A heavy emphasis is placed on helping parent coaches increase their comment frequency, level, and accuracy. A majority of supervision time is spent on practicing comments, brainstorming strategies to comment more, and viewing video for missed commenting opportunities. Additionally, coaches' coding is compared with supervisors' coding, which is thought to help coaches learn to better recognize and label ABC-targeted behavior. Thus, by demonstrating the links between ITM comments and parent behavior at the micro-analytic level, these findings reinforce the importance of ITM supervision. Specifically, since ITM comments appear to be linked to parent behavior change, focusing on this component of intervention in training and supervision should improve ABC outcomes for families.

Additionally, these findings suggest specific methods for ITM supervision. For example, supervisors may help coaches to compare clips with frequent commenting to clips with lower rates of commenting, with the goal of observing how a coach's commenting rate affects the parent's behavior. Given the findings of this study, parent coaches may be able to notice that their comments' increase rates of positive parent behavior. Further, these results also support having coaches code their own sessions, as the results suggest that maintenance of commenting after certification may be key to maintaining effects of ABC. Becoming a reliable coder will give parent coaches the

ability and tools to continue administering ABC with high fidelity after their year of coding supervision ends. Coaches will know the protocol of coding and reviewing sessions, and be able to reflect on their sessions independently. Thus, helping coaches to notice the significant effects of their comments by coding their own sessions, and training coaches to continue coding fidelity to reflect on sessions after completing training, should increase parent coach learning, motivation, and independence.

### **Noldus advantages**

The Noldus adapted ITM coding system is more time efficient than the original fidelity coding system. Using the original coding system, a 5- minute ITM clip takes 20 minutes to code because of extensive behavior and coach comment transcriptions. On Noldus, a 5-minute clip takes an average of 8 to 10 minutes to code. The quick-pace coding time in Noldus is advantageous because it allows for more videos to be coded while maintaining the key coding elements of the original system. Specifically, ITM clips on Noldus are coded for all the original ITM coding sheet's elements, including the specifics of comment level and on-/off-target.

Noldus allows for second-by-second coding which makes it more appealing for micro-analytic level research purposes than the original coding sheet. Specifically, second-by-second coding allows for recording of start and stop times, and coding of overlapping parent behaviors/parent coach comments. These additions allowed for the first micro-level analysis of ITM so far.

### **Noldus in ABC supervision**

The ABC intervention is being disseminated nationwide and keeping high intervention fidelity is a concern. A drop in intervention fidelity is notorious when

intervention leaves its origin site (Moncher & Prinz, 1991). Time spent in ABC training and parent coach supervision sessions must be used efficiently and effectively in order to keep up with the demand for ABC and maintain fidelity. In a two-day training, parent coaches are taught how to identify, comment on, and code ABC target behaviors. The intervention developer, Dr. Mary Dozier, and her co-investigator, Dr. Caroline Roben, lead the training by showing video, teaching target behaviors, and role-playing as in-session parent coaches. Then, parent coaches begin supervision when they start their first ABC case. Receiving a year of supervision is ample time for the parent coach to develop, practice, and master commenting and coding; however, this achievement is not possible without sufficient supervision. The promising implications from this study support trainers' and supervisors' approach that focuses on comment rate, comment level, and coding.

In the future, supervision approaches could be explored to see which supervision approaches produce the most successful parent coaches. Although guidelines for supervision are consistent among all supervisors, each one has a different way of leading the weekly meetings. Supervisions could vary in a variety of ways. First, amount of time spent on coding compared to commenting could be explored. Also, some supervisors review video during session, while others discuss the clip utilizing the coding sheets only. Supervisors may have parent coaches practice comments on-the-spot (i.e., have coaches "role-play"), supervisors may suggest comments to the parent coach (i.e., "modeling"), and some use a combination of the two. Previous research has suggested that both role-play and modeling are helpful practices in clinical supervision (e.g., Heaven, Clegg, & Maguire, 2006), but we have not yet explored supervisory processes in ABC. Exploring the ways ABC is

taught and monitored is the next step in ensuring high intervention fidelity as ABC is disseminated. Further, the results of this study suggest that Noldus may be an effective tool to measure these processes of supervision, as the duration and percentage of observation variables were strongly correlated with comments. Additionally, coding in Noldus was efficient and not time consuming, as one might fear micro-analytic coding to be. Thus, future work might apply similar coding systems to study other processes of implementing and disseminating ABC.

### **Limitations and future directions**

Data suggest the 4-second lag after the parent coach comment may have been too short to find significant correlations between parent coach comment and parent behavior. Following the lead and nurturance behaviors are contingent on behaviors from the child. These behaviors may take longer than 4 seconds after the comment to reoccur. Restricting reoccurrence of the target behavior to the comment duration and 4 seconds after is a limitation of this study because it is a too short lag time.

In the future, a longer lag time can be used to analyze the already collected data. Using the same data set seems logical in this case given the significant results found with delight commenting and delight behavior. The significant link between parent delight behavior and delight comments are promising because delight is the only parent target behavior that is not dependent on a child behavior to occur. For this reason, one would hypothesize that delight would be the quickest recurring parent behavior. Finding significant links between delight comments and parent delight behavior with a short lag window makes looking at the other parent target behaviors with a longer lag worthwhile. In the future, experimenters can look back at their sequential analyses (see Figure 1) to estimate which lag time they could try next in



order to find significant links between parent coach commenting and the other parent target behaviors.

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