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ORIGINAL PAPER

The Sequential Relationship Between Parent Attentional Cues and Sustained Attention to Objects in Young Children with Autism

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Abstract This study examined the sequential relationship between parent attentional cues and sustained attention to objects in young children with autism during a 20 min free-play interaction session. Twenty-five parent–child dyads with a preschool child with autism participated. Results indicated that (a) parent attentional cues that maintained the child's focus of attention were more likely to support child sustained object attention than parent attentional cues that redirected the child from his or her focus of attention or introduced a new focus of attention ($d = 4.46$), and (b) parent attentional cues that included three or more parent behaviors were more likely to support child sustained object attention than parent attentional cues that included one or two parent behaviors ($d = 1.03$).

Keywords Autism · Parent–child interactions · Object attention · Attentional cues

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Introduction

Adamson and Bakeman (1991) described the process wherein infants learn from interacting with their caregivers as learning through "episodes of shared attention." A condition for early shared attention is the child demonstrating attention to an object which parents can then "follow". Unfortunately, sustaining attention to objects may be particularly challenging for young children with autism. Pierce and Courchesne (2001) found that children with autism spent less time engaged in object exploration than CA-matched typically developing peers ($d = -1.4$) and explored fewer objects than CA-matched typically developing peers ($d = -.93$). This challenge may pose a problem when interacting with young children with autism because naturalistic teaching methods (e.g., incidental teaching and pivotal response training) depend on following the child's attentional lead. If the child has difficulty sustaining attention to an object or activity, the parent's opportunity to provide developmentally facilitating input will be limited. Determining the types of attentional cues that parents of children with autism may use successfully to support sustained object attention may help us understand how we can extend these developmentally enriching opportunities to a variety of objects.

Transactional Model of Child Development

A transactional model of child development posits that the child affects his environment and interactive partners, which, in turn, affects the child (Sameroff and Chandler 1975). In this way, both the child and his environment change over time and affect each other in a reciprocal fashion. Applying the transactional model to child object attention, the child's attention to an object provides an

opportunity for the parent to provide information to the child. For example, the parent may move a toy in the child's visual field. The response that the child makes upon receiving this input influences the ensuing response from the interactive partner. For example, if the child smiles and reaches for the toy, the parent may say "Oh, you want the ball" and then hand the ball to the child. If the child turns away from the ball, the parent may either select a different toy or use a different attentional cue, e.g., rolling the ball toward the child. In either case, the response the parent receives from the child informs the subsequent adult action, which, in turn, influences the ensuing child response, and so on. The effects on child development may be both immediate (e.g., the child says "ball" in response to the adult's verbal cue) and cumulative (e.g., the history of the parent–child play interaction influences the child's knowledge of objects).

Information Processing Theory

Information Processing Theory (Atkinson and Shiffrin 1968; Miller 1956) directly relates to how successfully children may process attentional cues. One of the basic premises of Information Processing Theory is an assumption of the limited capacity of the mental system. In other words, the amount of information that can be processed by the brain at any one point in time is limited. If the attentional cue is ambiguous or lacks salience, the child is required to spend some of his or her limited information processing capacity to disambiguate the cue, which in turn leaves the child with fewer cognitive resources to establish or sustain attention to an object. Conversely, if the parent attentional cue is very salient, then the child may have sufficient cognitive resources to maintain or establish sustained object attention after processing the attentional cue.

Attention and Executive Function in Children with Autism

Difficulties with orienting and shifting attention in children with autism may also affect their ability to follow parent attentional cues. In their review of neuropsychological and neuroimaging research in autism, Sanders et al. (2008) conclude that while children with autism show deficits in set shifting and orienting of attention, research on sustained attention is indicative of functioning within normal parameters. As part of the array of executive function deficits (Happé and Frith 1996), shifting attention requires the individual to disengage from the current focus of attention and orient to a new stimuli. Therefore, a parent's lack of success in orienting his child to a novel object could be due to the child's deficits in orienting attention or executive function rather than any lack of salience on the part of the parent's attentional cue.

Parent Attentional Cues

Attentional cues that adults may use to orient the child toward an object or sustain child attention to an object may include, but are not limited to eye gaze, head turns, pointing, gesturing, vocalizing, touching, handling, moving, showing, tapping, and placing the child's body in contact with the object (Carpenter et al. 2002; Hollich et al. 2000; Leekam et al. 1997; Leekam et al. 1998; Leekam et al. 2000; Mundy et al. 1986; Whalen and Schreibman 2003). Adult attentional cues may be classified by whether they continue the child's focus of attention and also by how many behaviors adults combine when they direct or support their children's attention.

When we classify attentional cues by whether the adult is trying to maintain the child's focus of attention, the contrasting category is whether he or she is attempting to direct the child to a new focus of attention. In a study conducted with infants with Down syndrome and MA-matched high-risk preterm infants, Landry and Chapieski (1989) demonstrated across both groups that parent attentional cues which maintained the child's focus of object attention during a 10 min free play session resulted in a greater proportion of toy manipulation time than parent attentional cues that introduced a new focus of object attention *or* redirected the child from his or her current focus of attention. Theory suggests that shifting attention may come at a cost to the child that is manifested in the lower quality or reduced length of attention to the new object (Bloom 1993). No studies have examined whether maintaining the child's focus of attention influences the child's attention to objects in children with autism.

Attentional cues may also be characterized by whether the cue contains single or multiple behaviors. An examination of the literature on typically developing children indicated that the coordinated use of multiple adult attentional behaviors to redirect children's attention increased the likelihood that children will follow these cues. For example, Deák et al. (2008) found no statistically significant differences in the accuracy of child response (measured as the child orienting to the object) when the parent used an eye gaze plus distal point as opposed to an eye gaze plus directing vocalizations (e.g., "Look at the ball!") during a structured task. However, both of these behavioral combinations were more effective at accurately directing infant attention than eye gaze plus an eliciting vocalization (e.g., calling the child's name); and all behavioral combinations were significantly more effective at directing infant attention than eye gaze alone. No studies have examined

whether combining attentional cues influences the child's attention to objects in children with autism.

Using Sequential Analysis to Examine Parent and Child Behavior

By examining the antecedents and consequences of behavioral events, the researcher may generate hypotheses about why an individual behaves in a certain way and how manipulating environmental variables may serve to modify that behavior (Thompson et al. 2000). Sequential analysis allows the researcher to examine the extent to which one behavior occurs after another behavior, controlling for the base rates of those behaviors (Bakeman et al. 1989). The nexus of sequential analysis as applied to this study is the comparison of how often child attention to objects occurred after a particular type of parent attentional cue with that expected by chance. Time window analysis is the most appropriate sequential method to utilize when attempting to quantify the sequential association between parent attentional cues and child attention to objects when both the duration of the child's attention to objects and the time between the parent attentional cue and the child's attention to objects is of interest (Yoder and Tapp 2004).

Twenty-five parent–child dyads were observed during a 20 min free play interaction session. Time-window sequential analysis was used to determine if: (1) There was a stronger sequential association between child sustained attention to object and parent attentional cues when the parent matched the child's focus of attention than when the parent attempted to redirect the child from his or her current focus of attention or when the parent introduced a new focus of attention to a child who was not attending to an object. (2) There was a stronger sequential association between child sustained attention to objects when the parent coordinated three or more behaviors in the attentional cue than when the parent demonstrated one or two behaviors in the attentional cue. We predicted that the sequential associations between parent attentional cues and object attention for young children with autism would follow the same pattern as identified in previous work that investigated parent attentional cues and children with Down syndrome (Landry and Chapieski 1989) and parent attentions cues and children with typical development (Deák et al. 2008).

Method

Participants

Twenty-five parent–child dyads with a preschool child with autism participated in this study. The child participants met the following inclusion criteria: (a) a diagnosis of Autistic Disorder or Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS); and (b) chronological age between 18 and 60 months. Because the children were randomly selected from a larger communication intervention study (Yoder and Stone 2006), they also used fewer than ten words across three communication samples administered by research project personnel and the child's parent at entry into the study. Children were excluded from the intervention study if they demonstrated severe sensory or motor deficits, if they failed a hearing screening administered outside of the project, or if English was not the primary language spoken in the home.

Research diagnoses in the communication intervention study were based on results from the Autism Diagnostic Observation Schedule (ADOS; Lord et al. 2000) and clinical diagnosis by a licensed examiner familiar with young children with autism. The ADOS was administered by examiners who had been trained and certified to use Module 1. The children received ADOS scores consistent with a classification of autism. Table 1 presents descriptive information for the sample examined by the research questions.

The median formal educational level of the primary parent was 3–4 years of college (range = 10th grade—over 2 years of graduate school). Twenty-four primary parents were female; one primary parent was male. Sixty-eight percent (17) of the children were Caucasian, 16% (4) were African American, and 16% (4) reported "Other". Eighty percent (20) of the children were males.

Procedures

Each parent–child dyad was observed during one 20 min free-play interaction session in a university laboratory setting. Parents were allowed to select five toys from a larger toy set and were given the following instructions: "We are interested in observing what it is like when you try to join your child in doing the things that he/she likes. We are also interested in how your child will communicate with you during this time." After the first 10 min, parents

Table 1 Means and standard deviations for child descriptive variables

Variables ($N = 25$)	Mean	SD	Range
Chronological age (months)	31.9	8.5	18–50
Visual receptive age equivalent (months)[a]	17.5	4.6	8–26
Composite standard score[a]	52	6.7	49–74
Receptive language age equivalent (months)[a]	11.6	3.9	4–24
Expressive language age equivalent (months)[a]	11.3	4.1	4–22

[a] Based on the Mullen scales of early learning (Mullen 1992)

were given the option of changing toys, if desired. Both parent and child behaviors were coded from digital recordings of this procedure using ProcoderDV computer software (Tapp and Walden 1993). Please see the Table 2 for the coded categories and definitions.

Timed-event data (duration) were recorded for child behaviors because the onset and continuation of sustained object attention was the target variable of interest. Event data (onset only) was recorded for parent behaviors because the presence, not the duration, of certain types of parent attentional cues was the focus of the current investigation. ProcoderDV computer software (Tapp and Walden 1993) allowed recording of both the onset and offset time of coded events. The event data collected through ProcoderDV was subsequently analyzed using MOOSES computer software which allowed the observer to derive Yule's Q scores (Tapp et al. 1995).

Data Analysis

Deriving an Appropriate Index of Sequential Association

Because the magnitude of the difference between sequential frequencies between events is influenced by the base rates of the behaviors of interest (Yoder et al. 2004), we used an index of sequential association that allowed comparison across sequential patterns in which base rates differ: Yule's Q. A Yule's Q score was computed for each antecedent-target pair within each participant. These scores were then treated as dependent variables in group analyses (i.e., a paired t test). The range of Yule's Q is from -1 to $+1$, with a value of zero representing no effect (Bakeman and Gottman 1997). A negative Yule's Q indicates that the target behavior occurred after the antecedent behavior at less than chance levels. A positive Yule's Q indicates that the target behavior occurred after the antecedent behavior at greater than chance levels.

While there are no widely accepted conventions for the size of Yule's Q, a Q value = .82 is very large, a Q value = .6 is large, a Q value = .43 is moderate and a Q value = .2 is small based on Rosenthal's (1996) conventions for the odds ratio. Yule's Q has been used as an index of sequential association in studies that have examined the relationship between successive tests of word recognition, antiphonal laughter between social partners, clinical staff interaction and responsiveness in people with intellectual disabilities, and active support and resident engagement in community-based homes for adults with severe mental retardation (Felce et al. 2000; Hayman and Tulving 1989; Smith et al. 2002; Smith et al. 2004; Smith et al. 2002; Smoski and Bachorowski 2003). Please see Fig. 1 for an illustration of the 2 × 2 contingency table that was used to compute Yule's Q.

Testing Whether There are a Sufficient Number of Behavioral Events

A sufficient number of events must be tallied in the row and column totals (i.e., marginals) of the 2 × 2 table for the researcher to be able to interpret a Yule's Q. Similar to the process used to determine whether or not a chi-square test may be used, one may calculate the expected value of each cell in the 2 × 2 table and compare this expected value to a pre-determined level of acceptability. While researchers have not come to a consensus on this level of acceptability, Bakeman and Gottman (1997) suggest that a

Table 2 Definitions of variables coded during parent–child free play session

Code	Definition
Child attending to object	Active manipulation of an object, or attention to an object as evidenced by directed movement, eye gaze or verbalizations about an object for three consecutive seconds
Parent attentional cue	Parent behavior used to maintain, redirect or introduce the child's attention to an object. The parent must be demonstrating coordinated attention to the child and the object for the parent behavior to be deemed an attentional cue. The following list of attentional cues is exhaustive: Parent behaviors that bring the object into contact with the child, or parent vocalizations, or parent movement of object, or parent making the object produce visual or auditory "effects", or parent moving their hand/arm within the child's immediate visual field
Relation of parent cue to child focus of attention	Maintain: The parent demonstrates coordinated attention between the object and the child with the inferred intention of maintaining the child's focus of attention
	Redirect: The parent demonstrates coordinated attention between the child and object with the inferred intention of redirecting the child from his focus of attention to another activity or object
	Introduce: The parent demonstrates coordinated attention between the object and the child with the inferred intention of introducing a new focus of interest when the child is not attending to an object
Number of attentional cues	One attentional cue (see above for definition of parent attentional cue and exhaustive list)
	Two different, nonredundant attentional cues
	Three different, nonredundant attentional cues

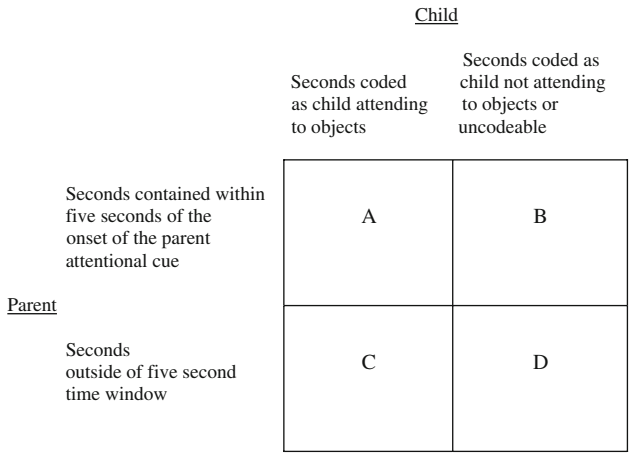

Fig. 1 Sample 2 × 2 table

minimum of an expected value of five events in each cell of the 2 × 2 table may be sufficient to detect the sequential association of interest. As there were an insufficient number of events in 14 dyads for parent attentional cues that introduced a new focus of attention or redirected the child from his or her current focus of attention, these categories were lumped together for subsequent analysis. Similarly, as there were an insufficient number of events in 13 dyads, parent attentional cues that included one or two parent behaviors in the attentional cue were lumped together for subsequent analysis.

Interobserver Reliability

Interobserver reliability estimates for independent raters were calculated for a randomly selected 20% of the parent–child sessions. Intraclass correlation coefficients (ICC) were used to estimate interobserver reliability for the Yule's *Q* scores that represent the sequential associations being tested. A five-second time window was selected for analysis because the interobserver reliability using a two-second window was unacceptably low.

Table 3 provides the ICC by dependent variable.

Note that the ICC for the Yule's *Q* for all sequential associations was sufficient, except for the association of child attention to object following the collapsed parent redirect/introduce cue category (ICC = .27). The consequence of this low reliability is a higher probability of not finding the predicted condition differences (Bartko 1966).

Results

Parent and Child Variables

The means, standard deviations and ranges for the parent and child variables are presented in Table 4.

It is noteworthy that the children spent a mean of 972.9 s in sustained object attention per 20 min session, meaning that approximately 80% of the total session was spent attending to objects. Perhaps due in part to the high rate of child object attention, the hypothesized superior type of attentional cue (parent maintain) is also the cue type that parents used most frequently, $t(24) = 4.965$ ($p = .000$). On average, parents provided about 50 attentional cues per session.

Parent Attentional Cues

Paired *t*-tests were used to test the difference in Yule's *Q* scores of the sequential dependencies between the different types of parent attentional cues and child object attention. We also computed the effect size for the within-participant differences of the sequential associations in the contrasting conditions. We considered an effect size over .5 as

Table 4 Means and standard deviations for parent and child variables

Variables	Mean	SD	Range
Duration of child attention to object (seconds)	972.9	181.6	567–1,163
Number of parent maintain cues	33.7	9.5	18–53
Number of parent redirect cues	6.3	6.1	0–19
Number of parent introduce cues	10.2	6.7	1–24
Number of one behavior parent cues	8.8	6.1	1–20
Number of two behavior parent cues	10.8	8.0	2–34
Number of three or more behavior parent cues	30.6	8.7	12–54
Proportion of maintain parent cues	0.69	0.11	.53–.89
Proportion of redirect parent cues	0.11	0.09	0–.29
Proportion of introduce parent cues	0.20	0.11	.02–.37
Proportion of one parent behavior cues	0.17	0.11	0–.50
Proportion of two parent behavior cues	0.20	0.10	.05–.39
Proportion of three or more parent behavior cues	0.64	0.15	.39–.90

Table 3 Interobserver reliability

Variable (Yule's *Q*)	ICC*
Child attention to object following parent maintain cue	.89
Child attention to object following parent redirect/introduce cue	.27
Child attention to object following one or two behavior parent cue	.91
Child attention to object following three or more behavior parent cue	.83

* Intraclass correlation coefficient

clinically important. According to Cohen (1988) a medium effect size is associated with a $d = .5$; and a large effect size is associated with a $d = .8$. In addition to testing the mean difference between conditions, we also examined the proportion of dyads who demonstrated the predicted pattern of results and the proportion of dyads with a positive Yule's Q for the superior condition (e.g., maintain; three or more parent behaviors in cue) and a negative Yule's Q for the inferior condition (e.g., redirect/introduce; one or two parent behaviors in cue). A positive sequential association is consistent with the hypothesis that the occurrence of a specific parent attentional cue improved the probability of child attention to objects while a negative sequential association is consistent with the hypothesis that the occurrence of a specific parent attentional cue decreased the probability of child attention to objects (Bakeman et al. 1989).

The mean Yule's Q scores are presented in Table 5.

Parent Attentional Cues that Maintained the Child's Focus of Attention

The strength of the sequential association between child sustained attention to object and parent attentional cues which maintained the child's focus of attention was greater than the strength of the sequential association between child sustained attention to object and the collapsed category of parent attentional cues which either redirected the child from his or her current focus of attention or introduced a new focus of attention, $t(24) = 23.369$ ($p = .000$). The Cohen's d for this difference was 4.46. All 25 dyads (100%) showed the predicted pattern of results in that the association between child sustained attention to objects and parent maintain cues was greater than the association between child sustained attention to objects and parent redirect/introduce cues. Ninety-two percent (23/25) of the dyads had a positive Yule's Q for parent maintain cues and 96% (24/25) had a negative Yule's Q for parent redirect/introduce cues. Using a binomial test, we determined that all of these proportions were significantly different from .5 at $p = .000$.

Table 5 Yule's Q scores for sequential analysis

Variable (Yule's Q)	Mean	SD
Child attention to object		
Following parent maintain cue	.68[a]	.32
Following redirect/introduce cue	−.66[a]	.23
Following three or more behaviors in cue	.27[b]	.47
Following one or two behaviors in cue	−.22[b]	.32

[a,b] Statistically significant difference in Yule's Q

Parent Attentional Cues that Included Multiple Behaviors

The strength of the sequential association between child sustained attention to objects and parent attentional cues which included a combination of three or more parent behaviors was greater than the strength of the sequential association between child sustained attention to objects and the collapsed category of parent attentional cues which included one or two parent behaviors, $t(24) = -5.129$ ($p = .000$). The Cohen's d for this difference was 1.03. Eighty-eight percent (22/25) of the dyads demonstrated the predicted pattern of results in that the association between child sustained attention to objects and parent attentional cues which included three or more behaviors was greater than the association between child sustained attention to objects and parent attentional cues that included one or two parent behaviors. Sixty percent of the dyads (15/25) had a positive Yule's Q for three or more parent behaviors in the cue and 76% (19/25) had a negative Yule's Q for one or two parent behaviors in the cue. The proportion of dyads that demonstrated the predicted pattern of results ($p = .000$) and the proportion of dyads that had a negative Yule's Q for one or two parent behaviors in the cue ($p = .015$) were significantly different from .5.

Discussion

Findings of the Study

Parent attentional cues that maintained the child's focus of attention were more likely to support sustained child object attention than parent attentional cues that redirected/introduced a new foci of attention for all dyads. The vast majority of the dyads also demonstrated a positive relationship between parent maintain cues and child object attention and a negative relationship between parent redirect/introduce cues and child object attention. These data extend the work of Landry and Chapieski (1989) who similarly found that parent attentional cues which maintained the child's focus of object attention resulted in a greater proportion of object attention than parent attentional cues that introduced a new focus of object attention or redirected the child from his or her current focus of attention. Recall from an earlier discussion that children with autism demonstrate difficulty shifting attention (Sanders et al. 2008). Parent attentional cues that either redirected the child or introduced a new focus of attention may have been more difficult for the child to process and follow; therefore, parent maintain cues were more likely to support object attention.

This study also extends the work by Deák et al. (2008) by demonstrating that parent attentional cues that included

the coordination of three or more behaviors were more likely to support child sustained object attention than parent attentional cues that included one or two behaviors in a majority of dyads. While certainly not as robust as the results for parent cues that matched the child's focus of attention, most of the dyads who demonstrated the predicted pattern of results for the coordination of behaviors in parent attentional cues demonstrated a positive sequential relationship between three or more parent behaviors in the cue and child sustained object attention and a negative sequential relationship between one or two parent behaviors in the cue and child sustained object attention. Attentional cues that combine multiple behaviors may provide more information to the child than cues that contain fewer behaviors. For example, if the parent points to an object without delivering any other attentional cue, the child may be confused as to which item the parent is referring. This confusion may reduce the probability that the child can immediately (within 5 s) establish or maintain sustained attention to an object. However, if the parent points to the object, labels it and then moves the object, the child is easily able to identify to which object that parent is referring.

Interestingly, parents also used a greater number of the attentional cue that had a stronger sequential association with child sustained object attention. Specifically, parents used more maintain cues than redirect or introduce cues and they used a combination of behaviors in their attentional cues more than single behaviors. This finding suggests that mothers may be consciously or unconsciously aware of the greater efficacy of these superior cue types (i.e., maintain and a combination of behaviors) when attempting to sustain their child's object attention. This finding adds to the body of transactional data (Sameroff and Chandler 1975) indicating that the reciprocal interactions parents and children have with each other effects how these interactions occur at a particular time period.

Limitations of the Study

Behavior Sample Size

A lack of sufficient events in several behavioral categories limited the scope of this study. We were unable to distinguish (a) the sequential effects of parent attentional cues that redirect the child from his or her focus of attention separately from the sequential effects of parent attentional cues that introduce a new focus of attention and (b) the sequential effects of the use of one parent behavior in the attentional cue separately from the sequential effects of the use of two parent behaviors in the attentional cue. Therefore, we strongly recommend that future investigation of the relationship between parent attentional cues and child object attention involve a larger behavior sample in terms of the number of dyads included in the investigation, the length of the parent–child interaction session, and additional interaction sessions.

Generalizability (G) and decision (D) studies may be used to help the researcher estimate the number of interaction sessions, raters and other aspects of measurement that are necessary to obtain scores that are stable across observation sessions (McWilliam and Ware 1994). One would need such information to conduct studies in which the sequential association between parental cue type and child sustained attention to object is expected to vary as a function of child or parental characteristics. This is the topic of suggested future research on the association between dyadic characteristics and the strength and direction of the sequential association between parental cue type and child sustained attention to object. While G studies help the researcher identify sources of error in an experiment, D studies help the researcher determine what combinations of experimental components minimize this error (Bruckner et al. 2006).

Correlates of Sequential Associations Between Parent Attentional Cues and Child Attention to Object

Another limitation of this study is the lack of examination of both parent and child correlates of the examined sequential associations. An examination of such correlates would help us specify the subgroups for whom attentional cues of a particular type have the predicted effects and thus improve both our ability to make recommendations to the field and to explain the few participants that did not show the predicted results.

While sequential analysis allows the researcher to quantify patterns of social interaction and determine whether one behavior improves the probability of another behavior to occur, sequential analysis does not justify a confident inference that the antecedent caused the target to occur (Bakeman et al. 1989). Therefore, while we are able to determine whether a specific type of parent attentional cue improves the probability of child object attention, we cannot claim that a specific type of parent attentional cue *caused* child attention to objects. Experiments that include the manipulation of parent attentional cue types are necessary to provide the basis for strong causal inferences.

Implications of the Findings

The results of the current study extended work by Landry and Chapieski (1989) to dyads that include parents and young children with autism spectrum disorders. First, parents in this study were more likely to attempt to maintain their child's object attention than redirect their child's attention or introduce a new focus of attention. Second,

parent maintain cues were more likely to support children's sustained object attention than were redirect/introduce cues. Based on this finding, we can recommend that most parents use maintain cues to sustain object attention in young children with autism.

While the combination of three or more behaviors in the parent attentional cue was more likely to support sustained child object attention that the use of fewer behaviors, forty percent of the dyads had a negative sequential association between parent cues that contained multiple behaviors and child sustained object attention. Therefore, we cannot recommend that parents use a coordination of behaviors in their attentional cues for all young children with autism. Further investigation into the specific combination of behaviors that result in a positive sequential association between parent attentional cues and child sustained object attention may be warranted.

Conclusion

This study adds important information to the study of the types of parent attentional cues that are likely to result in sustained attention to objects in young children with autism. We demonstrated that parent attentional cues that maintain the child's focus of attention or that include a combination of parent behaviors to direct the child's attention were among the most effective types of attentional cues studied. Further specification of the characteristics of parent–child dyads that affect the relative efficacy of various types of attentional cues is an important area for future study. Additionally, more detailed distinctions among the types of parental attentional cues and child attention to objects may be necessary to determine if parents aid their child's more elaborated attention to objects. Such future studies will require sampling more sessions or longer sessions than occurred in the present study.

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