

Consequences of Interest-Based Learning on the social-affective behavior of young children with autism

Carol M. Trivette¹ & Carl J. Dunst²

Abstract

The extent to which variations in the interest-based learning opportunities afforded young children with autism were related to changes in the children's social-affective behavior was the focus of an exploratory study. The participants were 17 children and their mothers. Mothers first identified their children's interests and then selected everyday activities that provided opportunities for engagement in interest-based learning. Based on investigator assessments of the children's participation in the activities, children were divided into high and low interest-based learning opportunity groups. Results showed that after 12 weeks of intervention, the high interest-based group demonstrated more positive and less negative social-affective behavior compared to the low interest-based group. Implications for research and practice are described.

Keywords: Autism, Child interests, Everyday learning, Social and affective behavior

* Received: July 26, 2010; Revised: October 17, 2011; Accepted: October 20, 2011.

© 2011 Associazione Oasi Maria SS. - IRCCS / Città Aperta Edizioni

¹ Orelena Hawks Puckett Institute, 128 South Sterling Street, Morganton, North Carolina 28655. E-mail: ctrivette@puckett.org

² Orelena Hawks Puckett Institute, 8 Elk Mountain Road, Asheville, North Carolina 28804. E-mail: cdunst@puckett.org

Corresponding author: Carol M. Trivette, Ph.D., Orelena Hawks Puckett Institute, 128 South Sterling Street, Morganton, North Carolina 28655.

The study reported in this paper was supported, in part by, the U.S. Department of Education, Office of Special Education Programs, Research to Practice Division (Grant #s H024S96000S and H324C010062). The opinion expressed, however, are those of the authors and do not necessarily reflect the official position of the Department or Office.

1. Introduction

This brief report includes findings from a pilot study examining the influences of interest-based everyday learning on the social-affective behavior of young children with autism. Children with autism as young as two or three years of age often have problems with social relatedness, including, but not limited to, attenuated positive social behavior (e.g., minimal amounts of social smiling), more than normal negative behavior (e.g., excessive crying or becoming easily upset), and poor interpersonal communication behavior (Barrett, Prior, & Manjiviona, 2004; Dawson, Toth, Abbott, Osterling, Munson, Estes, & Liaw, 2004). The consequences of poor social functioning include the inability to initiate interactions with or respond to initiations by adults and other children (Doussard-Roosevelt, Joe, Bazhenova, & Porges, 2003; Warreyn, Roeyers, & De Groot, 2005).

Recent research indicates that the negative consequences of the social behavior associated with autism can be attenuated when the children's interests are made part of either or both informal and formal learning activities. For example, studies by Boyd, Conroy, Mancil, Nakao and Alter (2007), Vismara and Lyons (2007), and others (e.g., Koegel, Dyer, & Bell, 1987; Adams, 2000) have shown that incorporating the interests of children with autism into behavioral interventions has positive consequences and outcomes on different aspects of the children's behavior, including, but not limited to, joint attention, peer interactions, and communicative abilities.

Findings from a line of research on young children's everyday learning in family and community activities (e.g., Dunst, Hamby, Trivette, Raab, & Bruder, 2000; Trivette, Dunst, & Hamby, 2004; Dunst, Bruder, Trivette, & Hamby, 2006) led us to test the hypothesis that the more children participated in interest-based learning activities, the more positive and less negative were the children's social-affective behaviors. Observations of the children in our previous studies, including children with autism, indicated that when the everyday opportunities afforded the children had interest-based features and elements, more positive were the behavioral and developmental consequences. The analyses reported in this paper used both investigators' and parents' ratings of children's social-affective behavior as outcome measures, and differences in the children's interest-based everyday child learning opportunities as the independent variable, to test the hypothesis that higher levels of interest-based learning opportunities would be associated with more positive and less negative children's social-affective behavior.

2. Method

2.1 Participants

The participants were 13 males and 4 females with autism and their mothers. All of the children had autism as a diagnosis prior to the study, which were made by professionals from highly regarded programs serving children with autism, diagnostic centers specializing in the assessment and treatment of autism, and as part of eligibility determination for preschool special education. The majority ($N = 14$) of children's diagnoses were made using the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1993), while two of the children's diagnoses were made using the Autism Diagnostic Interview-Revised (Rutter, LeCouteur, & Lord, 2003) and one using the Autism Behavior Checklist (Krug, Arick, & Almond, 1980). Most of the children were recruited from the programs and centers where the diagnoses were made, while the rest were recruited from organizations for parents of children with autism.

The children were between 23 and 71 months of age ($M = 56$, $SD = 12$) and had a mean developmental age of 44 months ($SD = 18$). The children's mean developmental quotient was 77 ($SD = 24$). The mothers were between 25 and 47 years of age and had completed 12 to 20 years of formal education. The socio-economic status of the families covered the full spectrum from low to high with most having middle class backgrounds.

2.2 Procedure

An investigator-developed protocol employed in previous studies (Dunst, Bruder, Trivette, Hamby, Raab, & McLean, 2001; Dunst, Trivette, & Cutspec, 2007) was used to first interview the mothers to identify the things a child liked to do, enjoyed doing, preferred to do, and the people and events that made a child laugh, smile or vocalize. The protocol included a series of main questions (e.g., "Who are the people who get your child to smile or laugh?" "What are the things that get your child excited?") and follow-up probes to elicit a complete description of a child's interests. The protocol also included a series of main questions and follow-up probes to identify those activities (parenting routines, child routines, play activities, etc.) that constituted a child and family's everyday routines. Each mother was then asked to select 8 to 10 activities that would provide her child learning opportunities everyday or almost everyday that were contexts for interest-based learning.

Every other week for 12 weeks, staff met with the mothers to review what had been done since the previous session and to help each mother plan which activities would be used to provide their child interest-based learning opportunities during the following two weeks. During each session, the mothers were also asked to indicate how often their child participated in different activities during the past week and indicated on a 5-point scale, ranging from *not-at-all* to *always*, how much participation in each ac-

tivity was something the child enjoyed or was interested in doing. The total number of activities that were rated a five on this scale was divided by the total number of activities a child experienced multiplied by 100 to obtain each child's interest-based learning opportunity score. The children were divided into low and high interest-based learning opportunity groups by assigning the children with the lowest interest scores to the low group and assigning the children with the highest interest scores to the high group. The two groups differed significantly in their interest-based learning opportunity scores as evidenced by a significant between group statistical test ($t = 4.60, df = 15, p < .0004$) and a very large Cohen's d effect size ($d = 2.23$) for the between group differences.

2.3 Measures

Both investigator-administered and parent completed rating scales were used as the outcome measures. The investigator-administered scale assessed both positive and negative child affect, and the parent completed scale assessed child social responsiveness. The scales were each completed on four occasions during the course of the study.

The investigator-administered scale included five positive child affect indicators (smiling, laughter, vocalizations, animated expression, excitement) and five negative child affect indicators (crying, fussing, apprehension, withdraw, avoidance) each rated on a 5-point scale based on observations of children during visits to the families' homes. The children and their parents were observed while they engaged in everyday activities (feeding, dressing, play, etc.) where the children's social-affective behavior manifested during the activity was the focus of the behavioral ratings. The sum of the ratings of the positive and negative behavior indicators were used as dependent measures. Inter-rater agreement was determined for more than one-fourth of the observations and ranged between 87% and 94%.

The parent-completed scale asked the mothers to indicate on a 5-point scale how often their child manifested seven different social behaviors on a typical day (enjoys being around other people, smiles or laughs, easily upset, fusses or cries, intense social engagement, communicative initiation, tries to get others' attention). The scoring of the negative behavior items was reversed to determine each child's social responsiveness score. The sum of the ratings on the seven indicators was used as the dependent measures in the analyses described next. The internal consistency estimates (coefficient alpha) for the scale responses at each assessment were all .88 or higher.

2.4 Method of Analysis

The independent variable was high vs. low interest-based group membership and the dependent variables were the summated scores on the two investigator-rated outcome measures and the one parent completed outcome measure. Linear growth curve analysis (Dixon, 1992) was used to

evaluate the relationship between variations in interest-based learning opportunities and changes in child social-affective behavior. The methodology first calculated a linear growth curve estimate (regression parameter) for each child using their repeated measures data and then evaluated the influence of group membership (low vs. high interest-based) on differences in the slopes of the outcome measures. Three analyses, one for each dependent measure, included a test for linear trends, a test for the average between-group differences, and a test for the interaction between groups and linear trends. The latter was the main focus of analysis.

The three tests were each evaluated by the *Z* statistic which was used to compute a Cohen's *d* effect size (Rosenthal, 1994) for substantive interpretation of the results because of both the small sample size in the study and the now generally accepted practice of using effect sizes rather than statistical significance for interpretation of study results (Thompson, 2001; Valentine & Cooper, 2003). Inasmuch as no prior research has been conducted on the influence of interest-based learning on the social-affective behavior of young children with autism to provide guidance about an expected size of effect, we used Cohen's (1988) guidelines for interpreting the results: $d = .20$ to $.45$ is small, $d = .45$ to $.75$ is medium, and $d = .75$ or higher is large (Vacha-Haase & Thompson, 2004).

3. Results

The findings are shown in Table 1. The effect sizes for the linear trends were medium to large for the negative child affect and social responsiveness measures, and the effect size for the positive child affect measure was small. In all the analyses, the children demonstrated incrementally more positive and less negative social-affective behavior between Weeks 1 and 12.

The effect sizes for the between group comparisons were medium to large. In all three analyses, the high interest-based group showed more positive affect and more social responsiveness, and displayed less negative affect, compared to the low interest-based group.

The three between-group differences were qualified by group by linear trend interactions as evidenced by the large effect sizes for these tests. The high interest-based group demonstrated incrementally more positive and less negative social-affective behavior between Weeks 1 and 12. In contrast, the low interest-based group demonstrated less positive and more negative social-affective behavior during the same period of time. Additionally, the high interest-based group demonstrated incrementally more social responsiveness over the course of the study, whereas the low interest-based group showed no changes on this outcome measure.

Table 1 - *Linear Growth Curve Analysis Results for Changes in the Children's Social-Affective Behavior*

	Linear Trend		Between Group Differences		Group X Trend Interaction	
	Z	d	Z	d	Z	d
Child Behavior						
Positive Affect	0.57	0.28	2.02**	1.12	2.01**	1.11
Negative Affect	1.03	0.52	1.81*	0.95	3.09***	2.20
Social Responsiveness	2.49**	1.50	1.36	0.70	1.42	0.72

* $p < .07$. ** $p < .05$. *** $p < .01$.

4. Discussion

Findings showed that child participation in everyday learning activities that was interest-based showed discernable relationships with measures of child social-affective behavior as assessed by research staff and as reported by the children's parents. Whereas previous research has found child factors such as child-preferred activities decrease the social avoidance of children with autism (Koegel *et al.*, 1987), the results presented in the brief report show how children's interests, a development-enhancing child characteristics (Bronfenbrenner, 1992), increases both the positive and decreases the negative social-affective behavior of children with autism. Development-enhancing characteristics are those personal (as well as environmental) factors that can stimulate and sustain interactions with objects and people in a manner that result in environmentally interesting or reinforcing consequences. The findings suggest that incorporating child interests into everyday learning opportunities can positively affect children's social and emotional behavior of young children with autism. It is significant to note that the relationships between children's interests and the child behavior consequences found in our pilot study are very similar to those found in other studies of young children with and without special needs (Raab & Dunst, 2007).

It has been established that the poor social-affective behavior associated with autism interferes with child learning (Koegel & Covert, 1972; Koenig, Rubin, Klin, & Volkmar, 2000) and often negatively influences the behavior of peers and adult caregivers (El-Ghoroury & Romanczyk, 1999; Warreyn *et al.*, 2005). Although children with autism vary considerably in

the severity of and symptoms associated with this disorder, deficits in social-affective functioning are common (Lord & Bishop, 2009). Findings from this pilot study showed that the interest-based everyday learning opportunities afforded children were related to the children's social-affective behavior as expected. That is, the children demonstrated more positive, and less negative social-emotional behavior, from the beginning to the end of the study, when everyday learning opportunities were interest-based.

Despite the positive and encouraging results reported in this brief report, there are nonetheless limitations that need to be mentioned. These include the way in which the independent variables were measured and the types of outcome measures that were used for assessing child social-affective behavior. The aggregate measure of child interests could potentially be problematic because it may have masked variations in the day-to-day differences in children's interest-based everyday learning. The use of behavior observations rather than rating scales for assessing child social-affective behavior would have provided a more direct measure of child behavior. Both limitations are partly offset by findings from other studies where direct measures of child social-affective behavior mapped onto children's interests in a manner similar to that found in this study (e.g., Raab, Dunst, Wilson, & Parkey, 2009).

A next step in this line of research is to investigate the specific characteristics of interest-based child learning that affects child social-affective behavior and how that behavior in turn affects other people. Recent advances in theories of children's interests are available to guide this type of research (e.g., Hidi & Renninger, 2006; Alexander, Johnson, Leibham, & Kelley, 2008). For example, Hidi and Renninger (1992) differentiate between a person's personal interests and those events experienced by a person that are situationally interesting, and postulate how each influences learning opportunities and the consequences of those opportunities. It would therefore be potentially illuminating to compare and contrast the effects of personal and situationally interesting child learning opportunities on social-emotional behavior as well as other outcomes (communication, engagement, joint attention, etc.). In addition to measuring specific features of interest-based child learning, this research would be strengthened if it included direct behavioral measures of outcomes of investigative interest.

The findings have at least several implications for practice. Incorporating interests into both formal and informal learning activities or using interests to select and engage children in interest-based learning activities would seem indicated based on the results reported in this paper as well as elsewhere (Adams, 2000; Boyd *et al.*, 2007; Warreyn, Roeyers, Van Wetswinkel, & De Groote, 2007). Guidelines for these kinds of interest-based learning opportunities can be found in Boyd, Alter, and Conroy (2005), Dunst, Herter, and Shields (2000), and McCormick and Mason

(1986). The interested reader is referred to Raab and Dunst (2007) for a description of the different ways child interests have been measured and used to influence the behavior and development of young children with and without disabilities, including young children with autism.

References

- Adams, L. W. (2000). Incorporating narrow interests into the school tasks of children with autism (Doctoral dissertation, University of North Carolina, Chapel Hill, 1998). *Dissertation Abstracts International*, 60(09), B4872.
- Alexander, J. M., Johnson, K. E., Leibham, M. E., & Kelley, K. (2008). The development of conceptual interests in young children. *Cognitive Development*, 23, 324-334.
- Barrett, S., Prior, M., & Manjiviona, J. (2004). Children on the borderlands of autism: Differential characteristics in social, imaginative, communicative and repetitive behavior domains. *Autism: The International Journal of Research and Practice*, 8, 61-87.
- Boyd, B. A., Alter, P. J., & Conroy, M. A. (2005, Spring). Using their restricted interests: A novel strategy for increasing the social behaviors of children with autism. *Beyond Behavior*, 3-9.
- Boyd, B. A., Conroy, M. A., Mancil, G. R., Nakao, T., & Alter, P. J. (2007). Effects of circumscribed interests on the social behaviors of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 37, 1550-1561.
- Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (pp. 187-248). Philadelphia: Jessica Kingsley.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Dawson, G., Toth, K., Abbott, R., Osterling, J., Munson, J., Estes, A., & Liaw, J. (2004). Early social attention impairments in autism: Social orienting, joint attention, and attention to distress. *Developmental Psychology*, 40, 271-283.
- Dixon, W. (Ed.). (1992). *BMDP statistical software manual: Volume 2*. Berkeley: University of California Press.
- Doussard-Roosevelt, J. A., Joe, C. M., Bazhenova, O. V., & Porges, S. W. (2003). Mother-child interaction in autistic and nonautistic children: Characteristics of maternal approach behaviors and child social responses. *Development and Psychopathology*, 15, 277-295.

Dunst, C. J., Bruder, M. B., Trivette, C. M., Hamby, D., Raab, M., & McLean, M. (2001). Characteristics and consequences of everyday natural learning opportunities. *Topics in Early Childhood Special Education, 21*, 68-92.

Dunst, C. J., Bruder, M. B., Trivette, C. M., & Hamby, D. W. (2006). Everyday activity settings, natural learning environments, and early intervention practices. *Journal of Policy and Practice in Intellectual Disabilities, 3*, 3-10.

Dunst, C. J., Hamby, D., Trivette, C. M., Raab, M., & Bruder, M. B. (2000). Everyday family and community life and children's naturally occurring learning opportunities. *Journal of Early Intervention, 23*, 151-164.

Dunst, C. J., Herter, S., & Shields, H. (2000). Interest-based natural learning opportunities. In S. Sandall & M. Ostrosky (Eds.), *Natural Environments and Inclusion* (Young Exceptional Children Monograph Series No. 2) (pp. 37-48). Longmont, CO: Sopris West.

Dunst, C. J., Trivette, C. M., & Cutspec, P. A. (2007). *An evidence-based approach to documenting the characteristics and consequences of early intervention practices* (Winterberry Research Perspectives Vol. 1, No. 2). Asheville, NC: Winterberry Press.

El-Ghoroury, N. H., & Romanczyk, R. G. (1999). Play interactions of family members towards children with Autism. *Journal of Autism and Developmental Disorders, 29*, 249-258.

Hidi, S., & Renninger, A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*, 111-127.

Koegel, R. L., & Covert, A. (1972). The relationship of self-stimulation to learning in the autistic child. *Journal of Applied Behavior Analysis, 5*, 381-387.

Koegel, R. L., Dyer, K., & Bell, L. K. (1987). The influence of child-preferred activities on autistic children's social behavior. *Journal of Applied Behavior Analysis, 20*, 243-252.

Koenig, K., Rubin, E., Klin, A., & Volkmar, F. R. (2000). Autism and the pervasive developmental disorders. In C. H. Zeanah, Jr. (Ed.), *Handbook of infant mental health* (2nd ed., pp. 298-310). New York: Guilford Press.

Krug, D. A., Arick, J. R., & Almond, P. G. (1980). Behavior checklist for identifying severely handicapped individuals with high levels of autistic behavior. *Journal of Child Psychology and Psychiatry, 21*, 221-229.

Lord, C., & Bishop, S. (2009). The autism spectrum: Definitions, assessment and diagnoses. *British Journal of Hospital Medicine, 70*, 132-135.

McCormick, C. E., & Mason, J. M. (1986). Intervention procedures for increasing preschool children's interest in and knowledge about reading. In W. H. Teale & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. 90-115). Norwood, NJ: Ablex.

- Raab, M., & Dunst, C. J. (2007). *Influence of child interests on variations in child behavior and functioning* (Winterberry Research Syntheses Vol. 1, No. 21). Asheville, NC: Winterberry Press.
- Raab, M., Dunst, C. J., Wilson, L. L., & Parkey, C. (2009). Early contingency learning and child and teacher concomitant social-emotional behavior. *International Journal of Early Childhood Special Education*, 1 (1), 1-14. Retrieved June 12, 2009, from <http://www.int-jecse.net/INT-JECSE-1.pdf>.
- Rosenthal, R. (1994). Parametric measures of effect size. In H. Cooper & L. V. Hedges (Eds.), *The handbook of research synthesis* (pp. 231-244). New York: Russell Sage Foundation.
- Rutter, M., LeCouteur, A., & Lord, C. (2003). *Autism Diagnostic Interview, Revised (ADI-R)*. Los Angeles: Western Psychological Services.
- Schopler, E., Reichler, R., & Renner, B. R. (1993). *Childhood Autism Rating Scale (CARS)*. Los Angeles: Western Psychological Services.
- Thompson, B. (2001). Significance, effect sizes, stepwise methods, and other issues: Strong arguments move the field. *Journal of Experimental Education*, 70, 80-93.
- Trivette, C. M., Dunst, C. J., & Hamby, D. (2004). Sources of variation in and consequences of everyday activity settings on child and parenting functioning. *Perspectives in Education*, 22 (2), 17-35.
- Vacha-Haase, T., & Thompson, B. (2004). How to estimate and interpret various effect sizes. *Journal of Counseling Psychology*, 51, 473-481.
- Valentine, J. C., & Cooper, H. (2003). *Effect size substantive interpretation guidelines: Issues in the interpretation of effect sizes*. Washington, DC: What Works Clearinghouse.
- Vismara, L. A., & Lyons, G. L. (2007). Using perseverative interests to elicit joint attention behaviors in young children with autism: Theoretical and clinical implications for understanding motivation. *Journal of Positive Behavior Interventions*, 9, 214-228.
- Warreyn, P., Roeyers, H., & De Groot, I. (2005). Early social communicative behaviours of preschoolers with autism spectrum disorder during interaction with their mothers. *Autism*, 9, 342-361.
- Warreyn, P., Roeyers, H., Van Wetswinkel, U., & De Groot, I. (2007). Temporal coordination of joint attention behavior in preschoolers with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 37, 501-512.