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A MESSAGE FROM THE PUBLISHER

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The Behavior Analyst Online organization expresses its heartfelt sympathy for the people affected by Hurricane Katrina. We hope that all of our readership will stop by our site at www.behavior-analyst-online.org for information on how to donate money to charities that will help survivors of the recent disaster in New Orleans and the other affected areas.

As part of its response to the disaster wrought by Hurricane Katrina, St. Joseph's University wishes to try to ease some small portion of the pain.

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- using digits for numbers (except at the beginning of sentences)
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Thank you!
The Journal of Early and Intensive Behavioral Intervention Editorial Board
Editorial:
The Growth of the Journal of Early and Intensive Behavioral Intervention

Joseph Cautilli, Ph.D.

The Journal of Early and Intensive Behavioral Intervention continues to grow. Currently, we have over 40 manuscripts still in the review process for this year issues and every day brings one or two more. The sheer number of manuscripts has been both blessing and curse. It has been a blessing in showing that online journals have come of age. When I began online publishing of psychological journals, the American Psychological Association was in the middle of its failed experiment to bring psychological journals online. APA eventually abandoned its journal, “Prevention and Treatment,” after three years. The editor called the experiment a failure and reported that the journal was over $100,000 in debt. The reason their attempt failed was that authors were concerned that online publications were new and not very well accepted. Concern existed that such journals would not be highly ranked or would not positively effect tenure and merit pay evaluations. Time has proved these concerns to be without merit.

As to the curse aspects of online publishing, moving such large numbers of manuscripts has overwhelmed our small editorial board. For the last issue, we placed a call for guest reviewers and we received about 12 people who wished to join the team. Many highly respected professionals in the field honored us with coming on board as permanent editorial board members. However, we still need more help, so I would like to extend that call in this issue. If you would like to be a guest reviewer or join the review board for the journal, please contact me directly at jcautilli2003@yahoo.com. Additionally, we are proud to announce that David Richman has agreed to become an associate editor for the journal. Dave is already hard at work on getting out a special issue this December on prevention.

It should be noted that we will be publishing four issues this year. The Journal of Early and Intensive Behavioral Intervention had originally planned to only do three issues this year (and this was an expansion from our original commitment of two issues a year), but given the large number of high quality articles that we have received (over 100 this year), the editorial team decided to publish four issues. So this will be a bonus issue for our valued readers.

The current issue is loaded with high quality and very interesting articles. We start off with an article on a three tiered model of evaluating children. Many of our U.S. readers know that the federal government has proposed that before children are diagnosed with a learning disability, they are tried on a researched based form of reading instruction that has empirical support. The article by Stewart, Martella, Marchand-Martella, and Benner suggest a three tier model to meet the regulations. Their model proposes an integration of behavioral interventions with reading interventions to help children not be left behind. In addition, the model points out a gating process from less restrictive to more restrictive interventions.

Along the lines of meeting federal regulations, the new Individuals with Disabilities Education Improvement Act is calling for greater use of positive behavioral support. Tobin and Sugia’s Preventing Problem Behaviors: Primary, Secondary, and Tertiary Level Prevention Interventions for Young Children look at the response of kindergarten and first grade children with internalizing and externalizing disorders to positive behavioral support programs. I believe that this article represents an excellent method of evaluating such school wide programs.
Moving from system support to early identification and treatment, Manno, Fox, Eicher and Kerwin, in an article titled "Early Oral-Motor Interventions for Pediatric Feeding Problems: What, When and How," explore oral motor problems. They provide a conceptual framework for understanding oral-motor skill development. Additionally, they highlight the problems that can occur in any infant and young child in oral motor development. They review the range of treatment techniques to help intervene in these problems, especially as they impact feeding and the empirical support for the techniques. The core of this conceptual framework offers much to researchers and practitioners.

To the world of early intervention, conceptual frameworks move not only the science but provide a method to integrate technology. Holth’s "An Operant Analysis of Joint Attention Skills" argues the need for behavior analysts working in language intervention to begin to read the research on joint attention. He offers a very clear rationale and how such research can be practically used with children with autism to enhance tact and mand training procedures.

While on the subject of autism, Romanczyk, White, and Gillis hold that at the core autism is a problem in social development. Their article, entitled "Social Skills versus Skilled Social Behavior: A Problematic Distinction in Autism Spectrum Disorders," proposes a model of social competence that is derived from a behavioral molecular analysis approach, but which is presented in a broad ecological context of social competence. I believe this model will generate a lot of interest and research in the future.

Moving from specific interventions to social policy, the role of television and television violence in our society has not received the attention it deserves. The role of T.V. has a major impact on not just aggressive behavior in children but also issues of activity levels and indeed may have a role in the rising rates of childhood obesity. Jason, Danielewicz, and Mesina in their article "Reducing Media Viewing: Implications for Behaviorists," explore these issues. The article reviews behavioral interventions to help parents facing these problems and cautions parents on the continued need to monitor children’s television viewing behavior.

While on the subject of helping parents, Fernandez and Eyberg, in the article entitled "Keeping Families In Once They’ve Come Through the Door: Attrition in Parent-Child Interaction Therapy," look at parent child interaction therapy, an empirically supported treatment based on integrating behavioral interventions into a play therapy context to lessen disruptive behavior in children. They observe the factors that lead families to complete the program and those factors that lead families to drop out of the program. Since early treatment is so critical for these families, behavioral practitioners would do well to understand these factors and to try to attenuate their effects in treatment.

Our final article this issue continues the theme of parent training for children with special needs. Bahadourian and Greer, in “CABAS Parent Education: Increasing Child Compliance Via Parental Emission of Unflawed Commands and Contingent Consequations During Play,” explore the use of a parent training program to increase parental use of unflawed commands and consequences.

So that’s the latest issue. We thank you for your continued support and readership as we continue to put out the highest quality international journal in behavior analysis and behavioral psychology.

Sincerely,

Joseph Cautilli, Ph.D.
Lead Editor/Publisher, Journal of Early and Intensive Behavioral Intervention
Three-Tier Models of Reading and Behavior

Rachel M. Stewart, Ronald C. Martella, Nancy E. Marchand-Martella
And Gregory J. Benner

Abstract

This paper provides a description of three-tier intervention models for reading and behavior. Although there is scientific evidence that the implementation of interventions at one or more levels of these models leads to improved reading or behavior performance, there is a paucity of research detailing the integration of three-tiered reading and behavior models. A future direction in the area of reading and behavior intervention models should be the integration of these models. This future direction is briefly discussed.

Keywords: Gating, Model of reading intervention, model of behavioral intervention.

Students must learn to read to be successful in our educational system and society as a whole. Kame’enui, Carnine, Dixon, Simmons, and Coyne (2002) noted, “reading opens up the world for children and is the doorway to learning. Unlike any other ability, the capacity to read allows children access to the collective knowledge, history, and experiences of our shared symbolic humanity” (p. 54). Even though reading is one of the most valued skills in the nation, many students continue to struggle learning to read. When students can’t read, precious resources in schools are devoted to remediating the skills of struggling readers, which is estimated to be as high as 70% of older students (Biancarosa & Snow, 2004). Additionally, 80 to 85% of students identified with learning disabilities have reading as their primary area of difficulty (Kame’enui et al., 2002). Deficits in reading achievement are associated with a host of negative outcomes including below grade level performance across the curriculum, grade retention, and failure to graduate (U. S. Department of Education, 2003). It is no wonder why reading has been the focus of instruction in the classroom, especially since the No Child Left Behind Act was passed.

As with reading difficulties, student behavior problems remain a primary concern to the general public and teachers. Not only is the proportion of individual students with severe behavior problems continuing to grow, but the severity and frequency of the antisocial behaviors displayed by these students continues to erode school climate and slow progress toward boosting academic achievement (Department of Health and Human Services, 1999; Walker, Ramsey, & Gresham, 2004). Effective methods for managing and responding to student misbehavior are critical. Walker, Ramsey, and Gresham (2003) noted, “aggression, disruptive, and defiant behavior wastes teaching time, disrupts the learning of all students, threatens safety, overwhelms teachers – and ruins their own chances for successful schooling and a successful life” (p. 6). Without the use of effective management programs, schools can expect to observe more than 20% of their students exhibiting problem behaviors (Scott, 2001). Additionally, Walker et al. (2003) noted, “schools can do a lot to minimize bad behavior – and in doing so, they help not only antisocial children, they greatly advance their central goal of educating children” (p. 6).

The purpose of this paper is to describe three-tiered models under which reading and behavior programs are designed. Additionally, the need to integrate reading and behavior models will be discussed.

Reading

There is an urgency in schools to eliminate or to prevent reading failure using research-validated programs. Torgesen (2000) noted, “children who become adults with low levels of
literacy are at an increasing disadvantage in a society that is creating ever higher demands for effective reading skills in the workplace” (p. 55). To aid in the elimination or prevention of reading failure, Vaughn and Linan-Thompson (2003) discussed the three-tier reading model. The authors noted that “to optimize learning opportunities for students, instruction at each level (primary, secondary, and tertiary) is more intense and explicit and the instructional group is reduced” (p. 144). Progress monitoring is an essential component of this model. This monitoring ensures students are making adequate progress and mastering concepts of newly learned skills.

The three-tier reading model, comprised of Tiers I (primary), II (secondary), and III (tertiary), uses explicit and systematic instruction to address or to prevent reading difficulties and to bridge the gap between students who struggle with reading and those who are successful. It should be noted that the three-tier model is a continuum where students enter and exit levels as needed. The primary goal is for students to succeed in reading and to be reading by third grade, which has become the national conversation about beginning reading instruction and intervention (Coyne, Kame’enui, & Simmons, 2004).

Tier I is the core reading program and is designed for all students in the school. This level does not exclude any student based on his or her reading skill. Further, Coyne et al. (2004) noted that a school-wide Tier I prevention program developed for all students in the school can optimize the individual reading outcomes for students with disabilities. Instruction using the core reading program is conducted by the classroom teacher in the general education classroom (Vaughn & Linan-Thompson, 2003). The core program must be researched-based and target phonemic awareness, phonics, fluency, vocabulary, and comprehension (Coyne et al., 2004). Furthermore, progress monitoring is conducted using a benchmark test three times per year. For example, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is an effective assessment system that is easy to administer and is sensitive to growth (Coyne et al., 2004). These tests are administered to kindergarten through third-grade students in the fall, winter, and spring. The core program should result in approximately 70-80% of the students meeting DIBELS benchmarks (Good, Kame’enui, Simmons, & Chard, 2005; Vaughn Gross Center for Reading and Language Arts, 2005). Those students who continue to struggle with reading and do not demonstrate adequate progress will move to Tier II.

At Tier II, supplemental reading instruction is provided to students who are not making progress in their core reading program. These students account for 20-30% of the school population (Coyne et al., 2004; Vaughn Gross Center for Reading and Language Arts, 2005). Furthermore, Coyne et al. noted that “schools also need supplemental and intervention programs and materials to support and reinforce the core program. Because one size does not fit all in beginning reading instruction, schools need to offer a continuum of instructional programs” (p. 238). Supplemental instruction to the core reading program is used such as double dosing the core reading program or using research-validated strategies including graphic organizers, repeated reading, and/or reciprocal teaching, to help students become successful and fluent readers. Tutoring may also be provided to small groups of students for 20-40 min per day (Vaughn & Linan-Thompson, 2003). The intent is that through small group instruction the students will “catch up” with their grade-level peers and exit Tier II. Those who need additional reading instruction move to Tier III.

Tier III is for students (5-10%) who did not make progress during Tier II instruction (Vaughn Gross Center for Reading and Language Arts, 2005). Often students are already failing in school (e.g., students with learning disabilities) or are seriously at-risk for reading failure. Early intervention is critical to bring students to grade level. Further, progress is monitored weekly and instruction changes if needed (Coyne et al., 2004; Vaughn & Linan-Thompson,
Reading instruction can be provided in small groups and/or one-on-one, and lessons are conducted for longer periods of time (60 min or more).

To ensure the success of a three-tiered reading model, five stages must be accomplished (Kame’enui & Simmons, 1998). Stage I assesses student performance using dynamic indicators of “big ideas” (e.g., phonemic awareness, alphabetic understanding, and automaticity with the code). Kame’enui et al. (2002) noted, “we use big ideas in reading to refer to a set of unifying curriculum activities necessary for successful beginning reading” (p. 57). The purpose of this stage is to identify students at-risk for reading difficulties. All children grades K-3 are screened with measures corresponding to the big ideas of reading.

Stage II analyzes individual performance and plans instructional groups. Using each student’s individual performance, teachers can identify those children who are at the greatest risk (“Intensive care” students), are at some risk (“Strategic” students), or are making adequate progress (“Benchmark” students). Children are grouped according to reading performance for strategic intervention.

Stage III sets ambitious instructional goals and monitors formatively. Ideally, assessment should take place on a weekly basis for the intensive care group and monthly for students in the strategic group. Using each student’s individual performance teachers should set 4-week and long-term instructional goals.

Stage IV analyzes intervention contexts and prioritizes intervention dimensions. Kame’enui and Simmons noted, “Stage IV activity focuses on the multiple contexts that must be considered when designing intervention and the importance of instructional fit with the host environment” (p. 19). Dimensions of intervention models include: setting (school and classroom), teacher situation organizer, and curriculum materials.

Finally, Stage V is comprised of evaluating interventions formatively and making instructional adjustments. During this stage teachers evaluate student progress toward established goals and determine if an instructional change is needed.

In a review of literature by Stewart, Martella, Marchand-Martella, and Benner (2005), five investigations that targeted only reading interventions as part of a three-tier model were analyzed (i.e., Coyne, Kame’enui, Simmons, & Harn, 2004; Gunn, Smolkowski, Biglan, & Black, 2002; Nelson, Benner, & Gonzalez, 2005; O’Connor, 2000; Vaughn, Linan-Thompson, & Hickman, 2003). Findings included the following. All five studies were conducted at the elementary level. Disability classifications included learning disabled, at-risk (i.e., reading disabilities, qualified for free and reduced lunch, and/or emotional disturbance), and high-risk (identified for special services). Three of the five studies implemented Tier II reading programs; one investigation examined the effects of using a Tier III intervention; the remaining study addressed all tier levels. Reading interventions consisted of explicit programs including: Open Court, Read Well, Reading Mastery, Write Well, Stepping Stones to Literacy, Harcourt, and Ladders to Literacy. Overall, the three-tier reading model demonstrated impressive results regarding reading improvement (e.g., comprehension, word attack, oral reading fluency, and rapid naming skills) across all five investigations.

Behavior

Underachievement often produces social functioning difficulties and is associated with behavior problems (Bower, 1995; Walker, Colvin, & Ramsey, 1995). Therefore, schools need to
develop and maintain a school-wide positive behavioral intervention and support program to create a safe environment and maximize student learning (Martella, Nelson, & Marchand-Martella, 2003). By implementing a school-wide program, schools can decrease the number of problem behaviors exhibited by students and provide a clear focus for intervention on the students with the greatest support needs (Scott, 2001). Gresham (2004) noted, “Schools are unique because they are the one place that teachers and students spend a significant amount of time together in both structured and unstructured contexts thereby creating numerous intervention-related opportunities” (p. 326). Additionally, Eber, Sugai, Smith, and Scott (2002) noted, “consensus is growing that prevention and early intervention must be prioritized, agencies must collaborate, and family-school partnerships must be improved so that effective interventions are actually implemented” (p. 171). It is crucial that all staff in the school is “on board” with a school-wide behavior management program. Commitment and consistency is essential for a successful program.

Therefore, it seems likely that implementing a school-wide behavior intervention and support program is critical to successful behavior management. As with reading, the three-tier intervention model for behavior addresses school-wide and individual student behavior problems. The three-tier model for behavior includes: Tier I (primary/universal), Tier II (secondary/selected), and Tier III (tertiary/targeted or intensive) (Walker et al., 2003). This model has also been referred to as the “three-tier prevention model” consisting of students without chronic behavior problems (primary prevention), those students at-risk for problem behavior (secondary prevention), and students with intensive behavioral needs (tertiary prevention) (Eber et al., 2002).

Tier I implements behavioral procedures for all students (Gresham, 2004; Walker et al., 2003). These procedures usually include a well-enforced school discipline code, school-wide discipline plans, district-wide bully prevention programs, and social skills training in the general education classroom (Gresham, 2004; Walker et al., 2003). Approximately 80-90% of students will respond to these procedures (Sugai, Sprague, Horner & Walker, 2000). These students do not exhibit any chronic problem behaviors. Students who are at risk for more severe problem behaviors are provided Tier II (secondary) interventions. These interventions are designed for students who are unresponsive to universal approaches (Eber et al., 2002; Sugai, Horner, & Gresham, 2002). At the Tier II level, behavioral interventions are implemented in small groups. Interventions such as behavior contracts, social skills training in a group, self-management strategies, and token systems can be used at this level (Gresham, 2004; Martella et al., 2003; Sugai et al., 2002; Walker, 2004). Students in the secondary level comprise 5-10% of the school population and are considered “at-risk” for future behavioral problems (Sugai et al., 2002). There may be some students who still do not respond to these behavioral interventions and will need to proceed to Tier III interventions.

Approximately 1-5% of students (treatment resisters) will need Tier III interventions and exhibit chronic patterns of violent, disruptive, or destructive behavior (Gresham, 2004; Sugai et al., 2002). Gresham stated, “the most intense level of intervention focuses on students that are the most recalcitrant to change and who exhibit chronic academic and/or behavioral difficulties” (p. 330). The use of functional behavioral assessments and implementation of behavior plans are often required at the Tier III level. Students need to be taught positive behaviors that replace the unwanted behavior being exhibited. Any behavioral interventions implemented at this level are highly individualized. Additionally, Walker et al. (2003) indicated that interventions need to be “family focused, with participation and support from mental health, juvenile justice, and social services agencies, as well as schools” (p. 13). Furthermore, it is imperative students at the tertiary
level receive effective interventions because they are responsible for 40-50% of all behavior disruptions in the school (Sugai et al., 2002).

A key to making this model work in schools is the use of a multiple gating procedure. Sprague and Walker (2000) described multiple gating procedures that are used for screening and identification of middle school age students who are severely at-risk for committing juvenile offenses. Martella et al. (2003) also described multiple gating procedures as part of a school-wide program. Walker et al. (2003) noted, “multiple gating is a process in which a series of progressively more precise (and expensive) assessment or ‘gates’ are used to identify children who need help with their behavior” (p. 14). The screening procedure generally includes three gates. Gate 1 is comprised of teacher nominations. During this first screening, teachers nominate students who match each of two patterns of behavior. The two patterns of behavior include externalizing (e.g., aggression, tantrums, violent outbursts) and internalizing (e.g., depression, lack of social skills, and/or extreme shyness). (Note: the two sets of lists will rarely have any overlap of students.) In Gate 2, teachers rank the students based on their externalizing and internalizing behavior patterns. Walker et al. (2003) noted that teachers could use rating scales that measure the frequency of adaptive and maladaptive behaviors. For example, one rating scale assesses whether students have exhibited any of 35 externalizing and internalizing behaviors within the past 6 months. Two to three top-ranked students move to Gate 3. During Gate 3, school psychologists, guidance counselors, or social workers observe and record the classroom and playground behavior of these students. If students are determined to be in need of specialized support, they are provided a Tier III program. Implementing a multiple gating procedure is critical for the early identification of students who exhibit problem behaviors (e.g., antisocial and violence).

In the review by Stewart et al. (2005), eight investigations that targeted only behavior interventions as part of a three-tier model were analyzed (i.e., Colvin & Fernandez, 2000; Eber, Lewis-Palmer, & Pacchiano, 2002; Lewis, Sugai, & Colvin, 1998; Nelson, 1996; Scott, 2001; Sprague et al., 2001; Sugai et al., 2000; Turnbull et al., 2002). Findings included the following. The level of schooling targeted across investigations included: elementary (n = 4), middle school (n = 1), elementary and middle school (n = 2), and all levels including high school (n = 1). Classification of disability included at-risk (i.e., free and/or reduced price lunch, behavioral difficulties, receiving specialized services, disadvantaged students, and antisocial), high-risk (i.e., severe behavior problems and acts of aggression and violence), autistic, and emotional behavioral disordered. Six of the eight investigations implemented a school-wide (Tier I) prevention or intervention strategy, and the remaining two investigations addressed all three-tier levels. There were a variety of behavioral interventions used across all eight studies including: social skills instruction, discipline plans, school rules and expectations, functional behavioral assessments, and Second Step Violence Prevention Curriculum. Overall, results across behavioral studies revealed a decrease in problem behaviors including office referrals, in-school suspensions, and out-of-school suspensions.

Integrated

Although most often discussed separately, reading and behavioral difficulties tend to covary (Martella et al., 2003). In other words, reading failure and behavior problems do not always occur in isolation. Often, these difficulties coexist in students and are key targets for intervention to ensure long-term success. Research findings confirm a strong link between reading failure and behavioral difficulties. For example, Gable, Hendrickson, Tonelson, and Van Acker (2002) noted that students with emotional and behavioral disorders exhibit a wide range of academic and behavioral problems. Additionally, they emphasized the growing support for
integrating instruction to address both reading and behavior problems. Further, Malgreen and Leone (2000) found “a disproportionate number of incarcerated youth demonstrate poor reading skills. While poor academic performance does not directly cause delinquent behavior, rates of re-offending and recidivism are highly correlated with low levels of academic achievement” (p. 239).

In the past, reading and behavior have been viewed within separate three-tier models. However, an integrated three-tier model addressing both issues is needed due to the coexisting relationship between reading and behavior problems. Many students enter school without the needed social or academic skills to attain success in our educational system. Horner, Sugai, Todd, and Lewis-Palmer (2005) noted, “The basic message is that academic and behavioral supports must be intertwined. Children will not learn to read by being taught social skills, but they also will not learn to read if a good curriculum is delivered in a classroom that is disruptive and disorganized” (p. 382). Thus, O’Shaughnessy, Lane, Gresham, and Beebe-Frankenberger (2003) posed the following question: “How can schools better assist children who enter school without the necessary knowledge, skills, or attitudes they need to be successful?” (p. 27). An integrated three-tiered reading and behavior model would target those students who lack the necessary academic and behavioral resources for a successful education. Additionally, Horner et al. (2005) noted, “Combining behavior support and effective instruction may be an important theme for school reform in the United States” (p. 382).

Gable et al. (2002) discussed integrating academic and non-academic instruction for students with emotional/behavioral disorders (E/BD). The authors proposed implementing an integrated planning model for students with E/BD. Using the three-step planning model teachers can identify and prioritize group or individual instruction for these students. This model would include: a Classroom Diversity Profile Form (teachers record information related to student academic functioning), a Class Profile and Management Form (teachers summarize information on strategies regarding classwide interventions, targeted interventions for subgroups of students at-risk, and student-specific interventions for students with special needs), and an Individual Instructional Plan Form (allows school staff to identify strategies that are aligned with individual student academic and non-academic needs). The overall purpose of this model is to integrate instruction to address both academic and behavioral deficits. Further, Gable et al. noted, “we have attempted to draw a parallel between what defines academic and non-academic success and to blur distinctions regarding planning to address common learning versus behavior problems of students with E/BD” (p. 464).

Based on a review of the literature by Stewart et al. (2005), there were only five investigations found that targeted both reading and behavioral difficulties as part of a three-tier model (i.e., Fulk, 2003; Lane & Menzies, 2003; Lane, O’Shaughnessy, Lambros, Gresham, & Beebe-Frankenberger, 2001; Lane et al., 2002; Nelson, Martella, & Marchand-Martella, 2002). However, it should be noted that two of the five integrated studies used only a reading intervention to reduce reading and behavioral difficulties (i.e., Lane et al., 2001; Lane et al., 2002). The level of schooling across investigations included elementary (n = 4) and high school (n = 1). Participants were classified as at-risk (i.e., learning difficulties, behavioral problems, antisocial behavior, high transience rates, and free and/or reduced price lunch). Intervention levels included Tier I (n = 1), Tier II (n = 2), Tiers I and II (n = 1), and all tier levels (n = 1). Interventions implemented included: tutoring, smaller homeroom classes, explicit phonics programs, Sound Partners, Talk It Out, SOS! Help for Parents, and Think Time. Results of implementing an integrated multi-level system revealed an increase in reading skills and a decrease in disruptive classroom behavior. Additionally, results indicated positive effects on social adjustment and academic performance among participants.
Future Direction

Overall, the goals of three-tiered reading and behavior models are to provide prevention and intervention simultaneously. The level of intensity increases as students move from Tier I to Tier III. A student’s response to the provided intervention will correspond to entering or exiting various tier levels. However, there is a need to integrate reading and behavior into a cohesive model given the strong correlation between low academic achievement and behavior problems (Heward, 2006). For example, approximately 67% of students with behavior problems cannot pass competency exams for their grade level and have the lowest GPAs (Heward). Additionally, approximately 75% of individuals in prison are poor readers (Kamps, Wills, Greenwood, & Thorne, 2003).

Unfortunately, an integrated model of reading and behavior is not being conducted on a large scale. As previously stated, only five investigations were found that integrated reading and behavior as part of a three-tier model. Two of the five investigations only focused on reading interventions and assessed corresponding changes in both reading and behavior.

Reading and behavior experts need to combine their expertise to form a three-tiered integrated model to reach students who are having significant difficulty in both areas. Results from integrated studies show improved academic performance and the reduction of behavior problems. An integrated system would be beneficial to both administrators and teachers as it saves time, money, and has been shown to be effective. Walker et al. (2003) noted, “the fact is, academic achievement and good behavior reinforce each other: Experiencing some success academically is related to decreases in acting out; conversely, learning positive behaviors is related to doing better academically” (p. 10). Given the fact that research strongly supports a link between reading and behavioral difficulties it becomes imperative that schools address these issues simultaneously.

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Preventing Problem Behaviors: Primary, Secondary, and Tertiary Level Prevention Interventions for Young Children

Tary J. Tobin and George Sugai

Abstract

The purpose of this report is to compare changes in social skills, problem behaviors, and academic competence for kindergarten or first grade students identified as being at risk for serious behavior problems who received primary, secondary, or tertiary level preventive interventions. Of the 93 participants in this study, 73% were male; 86% were Caucasian, and 65% were characterized as having externalizing behavior problems. A repeated measures analysis of variance indicated statistically significant differences (p < .01) between the groups based on type of intervention received the Self-Control subscale (e.g., controlling temper, responding appropriately to teasing) of the Social Skills Rating System (Gresham & Elliott, 1990). School-wide Positive Behavior Support is an effective primary prevention intervention, even for young children with serious internalizing or externalizing behavior problems.

Key words: Social skills, positive behavior support, self-control, externalizing problem behaviors, prevention.

Behavior problems interfere with success in school for many children and create unpleasant situations for teachers and other children. Although traditionally schools often responded reactively to problem behaviors, with punishments and exclusion, today many educators are seeking to prevent problem behaviors by using proactive, early interventions.

A three-tiered model of prevention, popular in many fields, involves primary, secondary, and tertiary levels of prevention. When problem behaviors at school are the concern, Positive Behavior Support (PBS) is an approach that offers these three levels of prevention (see http://pbis.org). Schoolwide discipline, at the primary prevention level, emphasizes teaching, prompting, and reinforcing appropriate behavior proactively and universally, to all children in the school (Sugai & Horner, 2002). When well implemented, it can be expected to enable most students to behave well in school.

Some students may be given additional, support, at the secondary prevention level, if they are considered “at risk” for problem behaviors. Decisions about who is “at risk” may be based on a variety of factors and assessed in different ways. One way of deciding that a child needs some extra behavioral support is simply to notice that the child seems to have some difficulties with peers or in following instructions. In the early elementary grades, teachers often notice behaviors that, while in themselves not particularly severe, might lead to greater problems later, and the teachers may decide to implement some type of early intervention. A more formal way of making this decision is to use a rating scale or other instrument that indicates which children have known risk factors.

A few children come to school, from the beginning, with serious behavior problems that are already well established. These children are in need of tertiary level prevention interventions, which are preventive in the sense of preventing the problem from getting worse.

What evidence supports the use of three levels of preventive interventions in Positive Behavior Support in schools? Although the concept is logical, data are needed to show specific effects. In addition, other questions beg for answers:

• What is the nature of secondary and tertiary level prevention of problem behavior?
• How does secondary and tertiary level prevention relate to other factors in the educational environmental context?
• How should the assessment of the effects of behavioral interventions be similar to, and different from, assessment of academic interventions?

Information is needed to clarify the relative effects of primary, secondary, and tertiary prevention level behavioral interventions and to identify unique aspects of applying this approach to behavior problems. A 3-tiered model that works well for changes in academic skills, such as learning to read, may not generalize to situations where resistance to behavioral interventions can only be understood in the relationship to the environmental context. For example, increasing the dosage, or amount, of secondary or tertiary interventions might be related to improved academic outcomes, but not necessarily to behavioral outcomes. One can see how additional instruction in reading would likely lead to improved reading skill. However, additional behavior support typically is related to resistance to intervention (RTI) shown by individuals with chronic and serious behavior challenges. Behavior problems, particularly school discipline problems, unlike reading problems, tend to increase in frequency as children get older, at least through elementary and middle school.

Across the United States, a number of Centers are developing and testing K-3 Behavior and/or Reading Intervention Models, funded by the Office of Special Education Programs (OSEP). Special studies of “Tracking Samples” (i.e., students identified as being at high risk of internalizing or externalizing behavior problems) have been added to larger research projects involving three-tiered, school-wide approaches to PBS that have primary, secondary, and tertiary levels of interventions to prevent behavior problems (CCE, 2003). In Oregon, the larger research that provides the foundation for the Behavior Tracking Study (BTS) is examination of the Positive Behavior Support (PBS) approach (e.g., Horner, Sugai, Todd, & Lewis-Palmer, 1999-2000; Sugai & Horner, 2002; Sugai, Horner, & Gresham, 2002) in what has come to be known as the 90 Schools Study, or, more formally, as the Research and Demonstration Center on School-Wide Behavior Support. Although the larger study involves 90 schools and a randomized design with a delayed start control group, BTS is focused on seven schools known to have well-established school-wide, primary interventions in place. In line with the PBS approach recommended by the Oregon Behavior Center, these schools that have demonstrated effective implementation of school-wide positive behavior support and are in an excellent position to turn their attention to the development and implementation of systematic secondary and tertiary interventions for students who need more support than school-wide systems can provide. In addition, these seven schools are in districts that have worked with the University of Oregon for several years to provide staff development, consultation, and inservice training related to the types of secondary and tertiary behavioral interventions used in the PBS approach (e.g., Crone & Horner, 2003; Crone, Horner, & Hawken, 2003; Tobin, Lewis-Palmer, & Sugai, 2002; Todd, Horner, Sugai, & Colvin, 1999).

The purpose of this preliminary analysis at the local level is to compare changes in social skills, problem behaviors, and academic competence for students who had been identified as having serious problem behaviors and who received different types of preventive interventions.

Method

In this section, we first describe the behavioral measures, because they are key to understanding how and why the participants were selected and the procedures that were used.

Key Behavioral Measures

Systematic Screening for Behavior Disorders (SSBD). The SSBD (Walker & Severson, 1990) identifies children who are at risk for behavioral disorders. A special version of the SSBD, the Early Screening Project (ESP) is used for kindergarten students (Walker, Severson, & Feil, 1995; Feil, Severson, & Walker, 2002). Two main categories of behavior disorders are addressed: internalizing and externalizing. The
internalizing concept is based on earlier work with preschool screening of children at risk for social withdrawal (Greenwood, Walker, Todd, & Hops, 1979). The externalizing concept is based on earlier work in the identification of adolescents at risk delinquency (Loeber, Dishion, & Patterson, 1984).

For the SSBD, teachers are given a description of typical characteristics of these two behavioral categories, asked to look at the list of children in their classroom, to consider each child’s characteristics, and then to list the ten children who best exemplify a description of externalizing characteristics and the ten who best exemplify a description of internalizing characteristics. The two lists are mutually exclusive, so a child can only be put on one of the lists. This is a universal procedure because each student is considered and thus has an equal chance to be identified for further assessment. The students in the lists of 10 are then ranked according to how closely they match the profile of an internalizer or externalizer. In this project, for each classroom, the three students with the highest ranks for internalizers and the three students with the highest ranks for externalizers are said to pass through Gate 1. These six students per class, who are nominated by their teachers as being potentially at-risk for behavior problems, form the intended sample for Tracking Study, and enter Gate 2 assessment. At Gate 2 of the SSBD, each student is rated by his/her teacher on both the SSBD Adaptive Behavior Scale and the SSBD Maladaptive Behavior Scale. The teacher marks a Likert-like scale for occurrence and frequency of specific behaviors. Normative data from the development of the SSBD indicates that, typically, at least one student per classroom is at risk for severe externalizing type behavior problems (e.g., aggressive, disruptive, oppositional) and one student at risk for severe internalizing type behavior problems (e.g., fearful, depressed, anxious, neglected by peers) in every two or three classrooms. The original SSBD included a third “gate” involving direct observations but that was not used in the identification of students for the tracking study. Instead, students who scored in the 30% percentile for “at-risk” on either the Adaptive (i.e., were lacking in adaptive social behavior skills) or the Maladaptive (i.e., had excessive maladaptive social behaviors) scales of the SSBD (or ESP) become eligible for on-going participation in the Tracking Study, and formal informed consent was recruited from their family.

Social Skills Rating System (SSRS). The SSRS provides norms for boys and girls from ages 3 to 18, based on a large national sample and it is designed to assist educators in planning interventions (Gresham & Elliott, 1990). Three behavioral domains are covered: competing problem behaviors (e.g., externalizing, internalizing, and hyperactivity problems) that interfere with the performance of appropriate behaviors, academic competence (e.g., reading, mathematics, motivation, and general intelligence), and social skills. Three social skills domains are included: cooperation, assertion, and self-control. Examples of these domains are given in Gresham (2001): (a) “Cooperation” includes “follows classroom rules; complies with teacher instructions” (p. 344); (b) “Assertion” includes “introduces self, questions rules that may be unjust” (p. 344); and (c) “Self-control” includes “controls temper in conflict situations, responds appropriately to teasing” (p. 344). Items are rated by frequency. The SSRS has forms for teachers, parents, and students. In this project, only teacher ratings were used. In addition, we used a developer-approved short form that contains only 18 key items.

Student Intervention Record (SIR, CCE, 2003). This instrument collected information from the teachers regarding the interventions the students received for behavioral support. Of particular interest for this analysis was the prevention level of the support provided.

Participants and Setting

The study took place in a medium sized city in the Northwest, during the 2002-2003 and 2003-2004 school years. Seven elementary schools, three from one school district and four from another school district, participated. All had previously documented fidelity with implementation of school-wide PBS on the SET. Figure 1 shows the SET scores for one of the schools; these types of scores were typical for all seven schools.
All children in kindergarten and in Grade 1 in these schools, a total of 1066 students, were screened using Gates 1 and 2 of the SSBD or ESP. Informed consent for participation was obtained by the schools for students who qualified, in accord with a protocol approved by the participating university’s Institutional Review Board. Of the 93 students who received permission and were eligible to participate at the time the study started, 25 (27%) were female and 68 (73%) were male. The ethnic distribution was as follows: 86.02% White, 5.38% Latino/Hispanic, 3.23% Pacific Islander/Asian, 1.08% Black, and 4.30% Other. Most of the students, 60 (65%), qualified as Externalizers; 33 (35%) qualified as Internalizers. In order to qualify, students had to meet certain “cut off” scores on the adaptive and/or the maladaptive behaviors scales of the SSBD (or ESP). An indication of the seriousness of the students’ behavior problems was that 76.34% of the sample met the cut off scores on both the adaptive and the maladaptive scale. About eleven percent met criteria only on the basis of maladaptive behaviors and about thirteen percent, only on the basis of a lack of adaptive behaviors. As of January, 2004, the percentage of the sample at each grade levels was: Kindergarten, 48.39%, first grade, 34.41%, and second grade, 17.20%. Over the course of time during the first two years of the project, due to school transfers, 7 students (all from the Externalizing group, 6 male) were lost to attrition, leaving a total of 86 at the end of the 2003-2004 school year.

**Independent Variable: Prevention Level of Intervention**

Using information from the SIR, four groups of students were identified, based on the level of intervention needed and/or received:
Primary Only: The school-wide PBS universal intervention (Sugai & Horner, 2002) was the only behavior support needed (n = 52).
Secondary: Added Behavior Education Plans (Crone, Horner, & Hawken, 2003), more commonly known as the “Check In, Check Out (CICO)” intervention (n = 8).
Tertiary: Added individualized function-based support (n = 22).
Time Lacking: Needed more than the primary prevention level intervention but time & resources were lacking so did not receive special intervention (n = 4)

Dependent Variables: Subscales of the Social Skills Rating Scale (SSRS)

The dependent variables were the raw scores on the seven SSRS subscales:
- Cooperation, Assertion, Self-Control (the Social Skills)
- Externalizing, Internalizing, Hyperactive Behaviors (the Problem Behaviors)
- Academic Competence

Interventions Described in More Detail

Primary Only. The following description of the primary prevention intervention is taken from School Climate and Discipline: Going to Scale (Sugai & Horner, 2001), a paper presented at the National Summit on the Shared Implementation of IDEA, in Washington, DC, June 23, 2001:

“Schools that adopt a school-wide PBS approach have the following features:

- An agenda of primary prevention has priority and is visible school-wide.
- All students and staff members are taught the school-wide expectations and received regular and frequent opportunities to practice them and to be positively acknowledged when they use them.
- A majority (>80%) of students, staff, and families can state the school-wide positive expectations and give a specific behavioral example for each.
- Positive school-wide behavioral expectations are defined, taught, and encouraged for all students using a range of positive and negative examples.
- Most contacts between teachers and students are prosocial (positive and preventive) rather than corrective and punishing (i.e., 5-8 positives for every negative interaction).
- A full continuum of PBS is available for all students at the school and district levels.
- Behaviorally competent personnel are readily available.
- A function-based approach serves as the foundation for addressing problem behaviors.
- All staff members actively participate in the implementation of school-wide PBS approach.
- Accurate and consistent implementation of PBS practices by all staff members is emphasized.
- The school administrator is an active participant and leader in the PBS effort.
- A school-wide leadership team guides the systemic adoption and sustained use of research-validated practices.
- School data are reviewed at least monthly to guide decision making and planning.

Schools that adopt a school-wide PBS approach consider four distinct and necessary implementation elements: (a) specification of clearly defined and measurable results, (b) use of data for decision making, (c) adoption of evidence-based practices and processes, and (d) provision of supports for high fidelity implementation.” (Sugai & Horner, 2001, p. 3).

Secondary. Check-in/Check-out (CICO), also known as “Behavior Education Plan” (Crone, Horner, & Hawkins, 2004), is a type of secondary prevention or targeted behavioral support that is widely used in various forms with students whose behavior problems do not respond sufficiently to primary prevention in the form of
universal, school-wide positive behavior support. Key features of the CICO intervention are (a) being readily available, (b) increasing monitoring and adult contact, (c) providing contingent and frequent feedback, and (d) increasing coordination between school and home support. Previous studies have indicated that many students benefit from CICO as shown by higher rates of academic engagement and fewer office discipline referrals (Hawken & Horner, 2003; March & Horner, 2002). CICO is relatively cost-effective and efficient, in comparison with comprehensive, individualized, tertiary prevention level interventions, for several reasons. First, CICO can be implemented quickly with minimal training for staff. Second, it does not require extensive assessments or consultations prior to use. Third, although the amount of time and resources may vary, generally it requires only a few minutes per day of staff time and only materials that most schools have on hand. After a brief, initial meeting of a behavior support team or a teachers’ assistance team, to clarify the nature of the behavioral issues for this student, students participating in CICO typically follow a routine, described by Crone, Horner, and Hawken (2004) as follows:

- Each morning the student will check-in with a designated school staff person (e.g., teacher, secretary, counselor, educational assistant). That check-in will determine if the student has materials needed for class and if the student is physically prepared to attend classes. The student is given a form (e.g., point sheet or card) to use throughout the day that lists the student’s behavioral goals and a matrix showing classes or time periods. This check-in usually takes less than 5 minutes and includes verbal prompts and encouragement.
- A key feature of CICO is that the teachers continually monitor the behavior of the student throughout the day. Each class period (or at other designated times), the student brings the form to the teacher, who marks a rating of how well the student met his or her behavioral goals. In some cases, the student also self-monitors.
- At the end of the school day, the student takes the form back to the staff person who conducted the morning check-in, for the afternoon check-out, which consists of a quick review of the form, verbal feedback, and, in some cases, small reinforce rs if certain goals have been met (e.g., 80% of possible points on the teachers’ ratings). The afternoon check-out typically takes less than 5 minutes.
- Students take the form (sometimes called a daily behavior report card) home to show their parents, who will sign it. It will be returned to school the next day.
- The school staff member who is monitoring the child maintains a record of progress, which can be charted and used to make decisions about maintaining, fading, or strengthening the intervention over time.

Tertiary. A tertiary prevention intervention would begin with a functional behavioral assessment (FBA) to identify the function or need underlying a student’s challenging behavior and enable teachers and other school personnel to develop individualized positive behavior support (Crone & Horner, 2003; Sugai, 1998; Sugai et al., 2000). FBAs vary according to individual needs and local school circumstances. The process of FBA may include a student interview (Ervin et al., 98; Kern, Dunlap, Clarke, & Childs, 1994; Jolivette, Lassman, & Wehby; 1998; Kearney & Tillotson, 1998; Reed, Thomas, Sprague, & Horner, 1997). Descriptive information often is obtained from other sources, such as: teacher or parent interviews; rating scales, direct observations in natural settings, and a review of school records and incident reports (Artesani & Mallar, 1998; Fox, Gunter, Davis, & Brall, 2000; McConnell, Hilvitz, & Cox, 1998; Todd, Horner, & Sugai, 1999). Descriptive assessments, which depend on naturally occurring variations in environmental factors, are valuable for “planning treatments that will succeed in the natural environment” (Schill, Kratochwill, & Gardner, 1996, p. 93).

Using FBA, adults can understand a child’s perspective and, with that in mind, develop interventions that will effectively decrease occurrences of inappropriate behavior while at the same time, provide the child with respect and consideration. Function-based support takes into account what Montague and Warger (1997) called “the desired outcome from the student’s perspective (e.g., attention from peers, teacher attention,
avoidance of a math task because the student lacks the skills” (p. 7). Many students who behave inappropriately have found that it provides quick access to powerful reinforcers, such as attention (even if negative) or opportunities to avoid difficult tasks. Teaching an alternative behavior that is functionally equivalent to the inappropriate behavior, in that it leads to the same consequence, eliminates problem behavior when the replacement behavior is a more efficient and/or more effective way to meet the need associated with the problem behavior (Carr, 1988; Carr, Reeve, & Magito-McLaughlin, 1996; Horner & Billingsley, 1988; Horner & Day, 1991; Neef, Bicard, & Endo, 2001; Neef & Lutz, 2001a, 2001b). In some cases, teachers include elements of CICO within a multi-component intervention based on an FBA (e.g., Condon & Tobin, 2001). The teachers in the schools involved in this study had access to assistance from a district behavior specialist and support from school and district behavior teams in conducting FBAs and developing interventions based on them. In addition, many of the teachers had previously received enough training and support that they were able to develop and implement basic function-based support on their own.

How does a student become eligible for a secondary or tertiary level behavioral intervention?

- Teachers decide to implement these interventions, either on their own or with the help and advice of a behavior support team or specialist.
- There is not a “formula” or “score” for making these decisions about interventions for individual students.

Results

The primary prevention level intervention, schoolwide PBS, met the behavioral support needs of most of the students in the tracking study. The majority (60%) of the tracking study participants did not need secondary or tertiary level interventions, according to their teachers. Some teachers commented that, although the child had a behavior problem, their typical classroom management strategies were sufficient. Thirty-five percent were given some type of additional behavioral support, either secondary or tertiary level prevention. Five percent were considered to be in need of some type of additional support but time and/or resources were lacking so no special intervention was developed. Of the students who received additional support, 27% were at the secondary prevention level and 63% at the tertiary. The targeted intervention used for secondary prevention was CICO. The intensive intervention used for tertiary prevention was function-based support. Of those at the tertiary prevention level, 26% received CICO as one part of a multi-component intervention based on an FBA.

What were the behavior problems? Teachers selected from a list of types provided on the SIR; more than one behavior could be selected. Self-control was always listed, either alone or with other behavior problems. Cooperation was listed 16 times, always in combination with some other behaviors. Attention/Hyperactivity was mentioned 9 times. Externalizing difficulties were listed 14 times but Internalizing difficulties, only twice. Other was used 4 times (e.g., group participation, talk outs, following directions, and transitions).

Some of the students (n = 47), at the end of Year 2, had been rated on the SSRS twice. The SSRS was administered to students in the first cohort in the Spring of Year 1 and again in the Spring of Year 2. Of the students in the second cohort, some attended schools where the SSRS was given in the Fall and in the Spring of Year 2; others attended schools where it was given only in the Spring of Year 2. To study changes over time, the students who had been rated twice on the SSRS were grouped by their SIR category. The number of students with Time 1 and Time 2 SSRS ratings in each group was as follows: 26 in the Primary Only group, 6 in the Secondary group, 13 in the Tertiary group, and 2 in the Time Lacking group.

Changes in Self-Control Social Skills

A repeated measures analysis of variance indicated statistically significant differences (p < .01) between the groups on raw scores for the Self-Control subscale of the SSRS (Table 1).
Table 1. Repeated Measures Analysis of Variance for Self-Control

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*Note. Values enclosed in parenthesis represent mean square errors.*

*p < .01

Tukey’s Studentized Range Test was used to control the Type I experimentwise error rate, while following up the ANOVA to identify mean differences. For the Self-Control subscale, statistically significant differences (p < .05) between the means were found for Tertiary and Primary at Time 2 (but not at Time 1). Figure 2 illustrates the changes for the different groups on the Self-Control measure.
Figure 2. Changes in Average Self-Control Scores on the SSRS by SIR Intervention Category

Other SSRS subscales, while not showing statistically significant change ($p < .05$) on mean scores, given the small n with two SSRS scores at this time, show interesting trends.

Cooperation Social Skills. The group that received the secondary prevention level intervention stood out as making the greatest change in on the Cooperation subscale, in comparison with the other groups, as shown in Figure 3.
Figure 3. Changes in Average Cooperation Scores on the SSRS by SIR Intervention Category

Assertion Social Skills. The Primary and the Tertiary groups improved more than the other groups on the Assertion subscale, as shown in Figure 4.
Internalizing Problem Behaviors. The Primary, Secondary, and Tertiary groups all decreased internalizing problem behaviors. The two students in the “Time Lacking” group, however, increased internalizing problem behaviors. In addition, this group had the highest scores on the SSRS internalizing subscale at Time 1 (Figure 5).
Figure 5. Changes in Average Internalizing Scores on the SSRS

Externalizing Problem Behaviors. The Primary, Secondary, and Tertiary groups all slightly decreased externalizing problem behaviors. The two students in the “Time Lacking” group, who initially had low scores on the externalizing SSRS subscale, were rated as having increased externalizing problem behaviors, surpassing the Primary group and almost reaching the level of the Secondary group (Figure 6).
Figure 6. Changes in Average Externalizing Scores on the SSRS

Hyperactive Problem Behaviors. The Secondary and Tertiary groups decreased their average scores on the SSRS subscale for hyperactive problem behaviors (Figure 7).
Figure 7. Changes in Average Hyperactivity Scores on the SSRS

*Academic Competence.* All of the groups improved, slightly, on the Academic Competence subscale of the SSRS. The Tertiary group, although the lowest at both Time 1 and Time 2, still improved the most and at Time 2, almost caught up with the Primary group (Figure 8).
Changes in Average Academic Competence Scores on the SSRS

**Figure 8.** Changes in Average Academic Competence Scores on the SSRS

*Out of School Suspensions and Discipline Problems*

Although young children in kindergarten and Grades 1 and 2 typically are not often sent to the principal’s office for disciplinary reasons or suspended out of school, some of the students in the tracking study had these types of problems. Table 2 shows the number of student in each SIR group who were suspended and Figure 9 shows the range and distribution of office discipline referrals (ODRs) for the tracking sample students, by grade level.

SEE FIGURE 9, NEXT PAGE
Table 2. Number of Students Receiving Out of School Suspensions by SIR Category

<table>
<thead>
<tr>
<th>SIR Category</th>
<th>Suspended</th>
<th>Not Suspended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Only</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>Secondary</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Tertiary</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Time Lacking</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>81</td>
</tr>
</tbody>
</table>

Discussion

The results indicate that (a) school-wide PBS is a beneficial intervention, particularly for increasing the social skill of self-control, even for children identified on the SSBD as having serious behavior problems and (b) students identified by their teachers as needing Tertiary interventions are resistant to interventions – the amount of support they needed must be adjusted accordingly.
Description of a New Tool

A new tool is being used to study systems level implementation of positive behavioral support in schools for students who need more than the universal schoolwide primary intervention. The Individual Student Systems Evaluation Tool (I-SSET) (Lewis-Palmer, Todd, Horner, & Sugai, 2003) measures the extent to which a school has the capacity to provide secondary (e.g., Behavior Education Plans such as those described in Crone et al., 2003) and tertiary (e.g., function-based support, see Crone & Horner, 2003) preventive interventions related to positive behavior support. It includes an administrator interview and a behavior specialist interview. Also, about five teachers or other staff members are briefly interviewed. In addition, there is a review of written documents related to individualized support.

Big Ideas

- Most of these young students, even though identified as having serious behavior problems (by inclusion criteria), did not need secondary or tertiary level prevention interventions.
- Of those who did need secondary or tertiary level interventions, most received support.
- Receiving support at a higher level and for a longer period of time does not necessarily translate immediately into improved behavior because intensive support is given to the students with the most serious and most resistant, chronic behavior problems.
- School-wide Positive Behavior Support is an effective primary prevention intervention, even for young children with serious internalizing or externalizing behavior problems.

References


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Author Note

George Sugai was at the University of Oregon when this research was conducted and is now at the University of Connecticut. Dr. Sugai continues in his role as co-director of the Center on Positive Behavior Interventions and Supports (http://pbis.org). Preparation of this manuscript was funded, in part, by the Office of Special Education Programs, Award #H324X010015. Portions of the report were presented by Tary Tobin at the Second International Conference on Positive Behavior Support, in Tampa, Florida (March, 2005) in “Research at the tip of the triangle from K to 12.”

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Early Oral-Motor Interventions for Pediatric Feeding Problems: What, When and How

Cecilia J. Manno, Catherine Fox, Peggy S. Eicher and MaryLouise E. Kerwin

Abstract

Children with developmental delays often have feeding difficulties resulting from oral-motor problems. Based on both clinical experience and a review of published studies, oral-motor interventions have been shown to be effective in improving the oral function of preterm infants and children with neuromotor disorders, such as cerebral palsy. However, oral-motor problems may be under identified in other populations of children with developmental difficulties. The purpose of this paper is to provide a conceptual framework for understanding oral-motor skill development and problems that can occur in any infant and young child and to review oral-motor treatment techniques and their empirical support.

Keywords: dysphagia, feeding behavior, oral stimulation, oral-motor, behavioral intervention.

Oral-motor problems in children are easy to recognize when the child coughs and chokes while eating. However, the majority of feeding problems present initially in more subtle ways, such as difficulty introducing spoon feedings or advancing texture, or limited variety of foods accepted (Kerwin, 1999). For some children, these more common feeding problems may reflect a specific oral-motor problem, such as uncoordinated tongue movement during lateralization or dysfunctional oral transport of the food bolus to the back of the mouth to initiate the swallowing reflex. Children with neurological disorders, or those born prematurely often exhibit oral-motor problems (Gisel, Alphonce, & Ramsay, 2000; Lau & Hurst, 1999; Sullivan, Lambert, Ford-Adams, Griffiths, & Johnsen, 2000). Increasing evidence suggests that oral-motor problems are under-recognized in children with problems other than cerebral palsy (Ramsay, Gisel, McCusker, Bellavance, & Platt, 2002; Reilly, Skuse, Wolke, & Stevenson, 1999), including children with autism disorders (Amato & Slavin, 1998).

Oral motor skills develop within a system that changes rapidly both in structural growth and neurological control during the first three years of life (Arvedson & Lefton-Greif, 1996; Bosma, 1986). During this period, children engage in a great variety of oral motor experiences as they satisfy their basic needs for food and comfort and begin to explore their world. Developmentally, a feeding problem exists when a child is “stuck” in their feeding pattern and cannot progress (Eicher, 2002; Kerwin, 2003; Palmer & Horn, 1977). Because oral motor skills represent a sequential progression of increasingly complex movement patterns, any disruption in practice can interfere with or limit positive oral motor practice, resulting in the loss of advancement in skill development and the learned behaviors that ensue (Illingworth & Lister, 1964). The challenge of treating children with feeding problems comes in identifying the specific areas that interfere with skill advancement for the individual child (Rudolph & Link, 2002; Stevenson & Allaire, 1991). Understanding each of the active factors interfering with skill advancement and the interaction of those factors enables the treating team to: 1) identify the specific factors contributing to the feeding problem; and then 2) ameliorate them to allow the child successful practice leading to positive learning, skill advancement and mastery (Kerwin & Eicher, 2004).

The following case history will serve as an example of some of the common, but more subtle, oral motor problems in children that require early, intensive intervention: bottle dependence, difficulty advancing texture, food refusal and food selectivity. Joey is a 4-year-old boy with hypotonia (i.e., low muscle tone), mild cognitive and motor delays, severe speech delay, poor social relatedness, and a
tendency to perseverate. He will eat only yogurt, Dutch apple dessert and pureed banana baby foods, and will drink only apple juice from a sippy cup. Joey’s mother reports that Joey always loved bottle-feeding, but preferred to drink lying down rather than while being held. He gagged and vomited every time spoon-feeding was attempted. At 15 months, his parents were able to introduce cream soups with a tablespoon while semi-reclined in a bouncy seat. Through the efforts of weekly feeding therapy, yogurt and the two fruit baby foods were successfully introduced. He has recently become interested in the green colored small fish crackers, but he only shaves the tails down with his front teeth. At age 2, the pediatrician advised getting rid of the bottle. When his parents stopped offering the bottle, Joey no longer accepted milk. Desperate to get fluids into him, his parents resorted to apple juice via dropper. He now accepts only apple juice and only through a sippy cup while lying down.

Joey’s feeding patterns demonstrate components of food refusal, food selectivity, failure to advance texture, and bottle dependence. Despite being four years old and having only mild motor and cognitive delays, Joey is stuck in a very abnormal feeding pattern with high risk of serious short- and long-term health and developmental consequences. The purpose of this paper is to elucidate the contributing factors to oral-motor skill development and practice, review the existing literature for empirical evidence regarding these interventions, and elaborate on possible intervention strategies that could be used to treat these feeding difficulties.

Development of Oral-Motor Skills

Oral-motor ontogeny follows a stepwise progression building on the suckle reflex to acquire the more complex oral-motor milestones suck, munch, and chew (Bosma, 1986; Ogg, 1975). Just as with gross motor skill development, milestone acquisition is not driven by maturation alone. Rather, the emergence of each oral-motor milestone is also dependent upon successful practice (Eicher, 2002; Illingworth & Lister, 1964; Pinnington & Hegarty, 2000). Infants are born with a biologically driven suckle reflex which fades around four months of age (Ingram, 1962). When the infant uses the reflex successfully with breast or bottle feedings, they master suckling and its coordination with breathing (Herbst, 1983). In addition, this practice occurs contemporaneously with neuronal growth and development that together enable the infant to acquire volitional control over the suckle response (Arvedson & Lefton-Greif, 1996; Bosma, 1986; Miller, 1993). If an infant does not experience successful practice with the suckle reflex before the reflex fades at four months of age, the suckle pattern may not be mastered (Illingworth & Lister, 1964). As a result, the infants may not be able to successfully initiate nutritive sucking (i.e., nipple feeding) without the propelling effect of the suckle reflex even if the child practiced non-nutritive sucking. This reciprocal, dynamic influence between the child’s practice during feeding and oral-motor skill development continues until the child has accomplished the most advanced skill, rotary chewing (Smith, Weber, Newton, & Denny, 1991).

Oral-motor skill development is integrally linked with increasingly complex tongue movements (Gisel et al., 2000; Morris & Klein, 2000). In the typical pattern of development, the tongue first moves liquids through a nipple in an anterior/posterior (in/out) pattern (i.e., suckling); and then liquids and pureed foods with a superior/inferior (up/down) pattern (i.e., sucking; Ayano, Tamuro, Ohtsuka, & Mukai, 2000; Tamura, Matsushita, Shinoda, & Yoshida, 1998). The tongue moves chewable foods with a lateral (side to side) pattern over to the molar surface and back to the center, splitting and separating the food until it is ground down enough and recollected to swallow (Ayano et al., 2000). As the child’s oral motor function advances, s/he learns to stabilize the jaw, working the tongue off this stable base first centrally with sucking and then laterally with munching (Meyer, 2000; Morris & Klein, 2000). Range of movement increases to allow sweeping anteriorly, posteriorly, laterally, and with tongue tip elevation.

In summary, the child’s feeding experience and practice directly influence oral-motor pattern and oral-motor pattern directly influences feeding response (Bosma, 1986). If the utensils or food taste and
texture do not change, the child does not learn to accept new foods and does not practice the new patterns necessary to manipulate the new food and transport it through the pharynx safely and efficiently (Gisel et al., 2000). Lack of appropriate and successful practice may result in the loss of previously acquired oral-motor skills and/or failure to acquire more advanced skills.

Factors Influencing Oral-Motor Skills

In addition to appropriate and successful practice, other factors can also negatively influence oral-motor skill development. Feeding and swallowing movements and behaviors are very complex and clearly involve much more than just activities in the mouth, throat, and stomach (Gisel, Birnbaum, & Schwartz, 1998). The sensory motor systems provide both the structural foundation and the sensory information that enable a child to practice and master oral-motor skills (Morris & Klein, 2000). Because the dynamic feeding process involves internal activities such as breathing, digestion, and elimination; structural alignment, control and sensory input are important from top to bottom.

Structural Alignment

In the clinical feeding lore, there is an old adage, “If you want the lips, you must first get the hips,” meaning that support for function in the mouth comes from structures below (Morris & Klein, 2000). Biomechanical alignment means that structures of the body are aligned to allow the most efficient muscular interaction. For example, when the pelvis is in a neutral position, the structures of the spine line up biomechanically. A neutral position of the pelvis not only makes sitting up straight much easier, but also provides the spinal alignment and base of support for the rib cage, shoulder girdle, and head position. Figure 1 depicts a typical head-forward position resulting from loss of the biomechanical alignment of the spine that in turn results in poor head-shoulder-trunk alignment. In the head-forward position, the tongue and jaw muscles are helping to stabilize the child’s neck. As a result, the jaw is depressed and food and liquid are often lost during meals because the tongue and jaw are not able to move as freely for oral-motor function compared to a head in a neutral position (Patrick & Gisel, 1990). Several studies have demonstrated that proper biomechanical alignment is associated with improved swallowing, feeding and speech functioning (Gisel, Schwartz, Petryk, Clarke, & Haberfellner, 2000; Hulme, Gallacher, Walsh, Niesen, & Waldron, 1987; Kumin & Bahr, 1999; Larnert & Ekberg, 1995).

Figure 1. Typical head-forward position that results from poor head-shoulder-trunk alignment
Biomechanical alignment becomes even more important when we consider that many muscle groups cross multiple joints and can work together or in competition with one another to adapt and complete a desired task (Howle, 2002). For example, muscles of the neck can function in several ways: 1) as respiratory muscles to assist with breathing, 2) as swallowing muscles, and 3) as postural muscles to help maintain head and neck alignment. These muscle groups learn to work together to maintain all of these functions (Mcfarland, Lund, & Gagner, 1994; Palmer & Hiemae, 2003). However, when life-sustaining activities, such as breathing, become more difficult, muscles will be recruited from other functions to complete the desired task. For example, when breathing is challenged, muscles of the neck are automatically recruited to help, impacting head alignment and swallowing control. In this situation, less efficient or “compensatory” motor patterns develop. If these compensatory motor patterns persist, skill refinement will be difficult and lack of mastery will result in persistent immature oral-motor patterns (Macie & Arvedson, 1993; Pinder & Faherty, 1999).

Sensory Motor Input

The motor and sensory systems work together in an exchange that creates proactive and reactive responses to sensory input from the environment (e.g., tactile, kinesthesia and proprioceptive cues) and internal sensory information from the body (e.g., arousal, hunger, satiety, pain, fatigue, “lump in the throat”, or the need to stool). When used in combination, the child is able to generate an appropriate response for the desired task, resulting in positive practice. Integrated sensory information is essential for developing motor planning skills that incorporate both motor control and motor learning (Roley, Blanche, & Schaaf, 2001). All of these factors must work in a coordinated process for the child to receive positive feedback from safe oral motor and swallowing skill development. This positive feedback provides information to help the child develop the internal desire that will enable the child to develop self-generating progress towards mastery of feeding and swallowing skills.

Muscle Tone & Oral-Motor Patterns

Low muscle tone in the facial muscle can result in an open mouth posture. Because stability of the jaw allows the tongue to dissociate movement patterns within the mouth, this open lax jaw precludes dissociation resulting in an immature anterior/posterior pattern in which the tongue and jaw move together. Moreover, wide jaw excursions decrease the ability to manipulate food within the oral cavity increasing the possibility of food falling out of the mouth or failure to chew smaller pieces of food due to the inability to grade movement. Because their tongue moves in and out, as opposed to side to side, these children are not exhibiting the oral-motor pattern that would enable them to adequately chew foods. The lips and cheeks work together providing enough tension within the mouth to contain the food and with the lips provide negative pressure to begin the swallowing process. If the lip and cheek muscles become shortened through compensatory motor movements and/or lack of practice, they will not be able to attain full muscle length required for lip closure. Therefore, tonal and muscle imbalance of these structures can leave the lips in an open position. This can result in losing food anteriorly or the inability to contain the food while manipulating it (Alper, & Manno, 1996; Ernsperger, & Hanson, 2004). The resulting pattern appears as though the child is pushing food out the front of the mouth, such as the oral-motor pattern that is typical of many children with Down Syndrome (Kumin & Bahr, 1999).

Medical Influence on Oral-Motor Patterns

Although any medical illness, if severe enough, can interrupt successful practice with feeding and contribute to development of a feeding problem, the two most common medical issues that interfere with feeding are respiratory and gastrointestinal (Eicher, 2002). Sensory inputs from the respiratory and gastrointestinal tracts directly influence oral motor patterns through the swallowing center in the brainstem (Miller, 1986). Because the upper respiratory tracts use the same structures as the upper
digestive tracts (i.e., back of the mouth, and throat), breathing is neurologically programmed to supercede feeding (Daniels, Devlieger, Minami, Eggermont & Casaer, 1990). Any respiratory illness that makes breathing more difficult will negatively impact feeding and swallowing. For example, a child with asthma whose rate of breathing is increased may drool and refuse to swallow because the increased respiratory rate does not allow enough time for swallowing between breaths (Timms, DeFiore, Marin, & Miller, 1993).

Recent research is beginning to document the impact of respiratory problems on the feeding and growth of preterm children (Lau, Smith, & Schanler, 2003). Although full-term and preterm infants did not demonstrate significant differences in feeding difficulties at their first oral feeding, by the time solid foods were introduced, preterm children were more likely to demonstrate feeding difficulties (Burklow, McGrath, Valerius, & Rudolph, 2002). Regression analysis indicated that medical factors, especially breathing assistance, accounted for more of the variance in feeding difficulties than preterm status alone. However, pacing the bottle feedings in a sample of preterm infants with respiratory diagnoses resulted in the development of more efficient sucking patterns, increased weight gain, decreased incidence of bradycardia during feeding and shorter hospital stays compared to infants bottle-fed traditionally (Law-Morstatt, Judd, Snyder, Baier, & Dhanireddy, 2003).

In addition to respiratory issues, gastrointestinal issues can also influence oral-motor functioning (Henderson, Woolf, & Marryatt, 1976; Hyman, 1993; Sivit, Curtis, Crain, Cruess, & Winters, 1988). Frequent nausea, fullness from constipation, delayed emptying, or discomfort from gastroesophageal reflux or other irritants reduce the child’s interest in eating as well as impacting the timing and degree of contraction of the muscle pattern required to complete the swallowing process (Mendell & Logemann, 2002; Waring, Feiler, Hunter, Smith, & Gold, 2002). As a result, the child becomes more protective of the airway and mouth; s/he may pull the tongue up or back to minimize entry into the mouth, and tongue movement is restricted (Mendell & Logemann, 2002). These changes may result in the use of more immature tongue movement patterns, less efficient tongue transport, and increased residual after the swallow (Mendell & Logemann, 2002). This can lead to preference for purees and foods that do not require increased tongue manipulation.

Case Illustration

When a child presents with a feeding problem, a comprehensive assessment needs to evaluate what oral motor pattern the child is using, and also what factors (medical, motor or learned patterns of behavior) are contributing to maintain the child’s use of that pattern. Let’s return to the example of Joey. Joey’s first symptoms of a feeding problem occurred with the introduction of spoon feedings. Gagging and vomiting prevented him from successful practice with a spoon. At that point, gastrointestinal issues should have been considered as interfering with feeding development. However, his history of wanting to drink the bottle lying down suggests the possibility of sensorimotor issues also playing a role. Perhaps his low tone increased his difficulty with head control when upright, his perception of alignment or orientation in space, or impacted his respiratory efficiency. Each or all could have been contributing factors to his difficulty practicing spoon-feeding. Any child who is unable to initiate spoon-feeding after 3-4 months of practice should be evaluated. Because Joey vomited when the spoon touched his tongue, caretakers changed the food on the spoon to enable him to practice without putting the spoon in his mouth. With liquid soups, they could pour the “food” in without touching his tongue. Sensorimotor issues were not addressed, as he remained reclined in a bouncy seat. With practice he was able to transition to a couple of smooth baby foods. However, his pattern was not changing since he never really accepted the spoon into his mouth and on top of his tongue. Thus he continues to use an immature nipple pattern for spoon feedings because that is all he has practiced.
At this point, the oral-motor pattern Joey has practiced dictates what foods he will accept; they all have to be able to be transported like a liquid. Foods that do not flow like a liquid are refused resulting in his food refusal. He can’t advance texture because he doesn’t let pieces of food into his mouth, and doesn’t have the tongue pattern necessary to manipulate them resulting in failure to advance texture. In addition, he has no experience eating in an upright position, which influences appropriate alignment and the muscle groups necessary to eat and swallow. Thus Joey now has multiple feeding problems resulting from medical and sensorimotor issues that initially prevented normal spoon practice. His lack of practice with normal patterns and increased experience with abnormal compensatory patterns in turn resulted in his food selectivity, failure to advance texture and ultimately food refusal.

**Treatment**

Treatment is most successful when the history of the child’s feeding progression is understood and a thorough assessment of the contributing factors has been done. Oral motor treatment should not start until medical issues are identified and controlled or stabilized, and issues of postural alignment and support have been addressed. To be most successful in providing oral motor stimulation, any medical issues need to be stable. This will help the child be more amenable to accepting any stimulation in the oral cavity and practice the oral-motor patterns that are needed. Since oral movements are refined motor movements, and they are distal to the pelvis and trunk, trunk alignment must be obtained to gain the best practice. Improving neck elongation and jaw stability will set the other oral structures in the correct alignment for active acceptance, manipulation and transport of food through the pharynx.

Oral stimulation should be viewed as preparation for eating; therefore, oral-motor practice with food should follow oral stimulation so that the movements facilitated during oral stimulation can be coordinated to practice food manipulation, transport and swallow. In other words, oral stimulation is a means to an end, and should not typically be done in isolation. Oral stimulation is typically begun periorally (i.e., outside the oral cavity) then transitioned to intraoral facilitation (e.g., Rendón-Macías, et al., 1999). More detailed descriptions and illustrations are contained in Alper and Manno (1996), DeGangi (1994), Gisel et al. (1998), Palmer and Heyman (1993) and Morris and Klein (2000).

**Specific Oral-Motor Techniques**

**Facial/Oral Muscle Tone.** If there are facial muscle tone issues, the use of tapping, pressure, vibration and speed of input can change tone (Morris & Klein, 2000). Figure 2 depicts a diagram of the facial muscles. Fast tapping, light touch, vibration and a fast pace alerts the system and can increase tone while slow tapping, deep pressure, vibration and a slowed pace tends to decrease tone. When the facial muscles are shortened or inactive, such as in children who are defensive about foods and utensils entering the mouth, stretching these muscles will improve the muscle length to enable a more mature movement patterns. For example, many children who refuse food will hold the upper lip in retraction showing their top teeth. The lips are in extension and there is tension throughout the face. In this position the child will not be able to use the upper lip actively to remove food from a spoon, drink from a cup without spillage, or place the tongue behind the teeth to receive the food. When the labial elevator muscles (i.e., levator labii superior, levator anguli oris and risorius) are stretched downward throughout the entire muscle, the upper lip can become more active.
Figure 2. Diagram of facial muscles

Stimulation of the orbicularis oris muscle improves flexion of the lips for mouth closure and puckering. Active use of this muscle assists in food containment, straw drinking and closure to provide the negative pressure necessary for transporting food through the oral cavity and swallowing. Active closure of the lips is needed to attain a single bolus swallow as opposed to a sequential swallow (i.e., multiple swallows in a row on a single bolus). Sequential swallowing is typical in children who are not transitioning to higher textured foods or who transport their food to the back of the mouth to swallow. This existing oral-motor pattern may be functional (i.e., the child successfully gets the food into the esophagus); however, prolonged practice with this type of pattern limits the child’s ability to advance to more mature oral-motor patterns.

Tongue & Transport. Stimulation to the tongue can be effective to change the movement of the tongue. Initially, implements (e.g., NUK, Ark probe) can be utilized to facilitate these movements. Then, modifying the method used to present the spoon with food and/or presenting small amounts of meltable foods (e.g., cheerio, cheese puffs) should be introduced to all the children to practice the new tongue movements with food.

When a child presents with a midline pattern (i.e., the tongue moves in and out with little side to side motion), s/he will not be able to efficiently chew and swallow a variety of foods. He may not be able to move the food laterally to the molars to grind down the food in preparation for swallowing. This will lead to the child learning to swallow foods whole or partially chewed. If the tongue movements are not altered, the child will continue to practice this less efficient movement and will not be able to advance to higher textured foods. The use of pressure on the middle of the tongue or the lateral sides of the tongue can facilitate the intrinsic and extrinsic lingual muscles to widen, thin out, narrow, elongate and flatten. Pressure on the lateral borders of the tongue can thin out the muscle and the tongue will move to that side. Stimulation to the anterior part of the tongue will facilitate a tongue tip. This serves to facilitate movement, increase acceptance of tactile sensation and acceptance of implements in the mouth.
Doing oral stimulation techniques alone provides sensation and movement but typically does not translate into accepting foods. Once the movement is active, food must be presented to use the pattern. For children who don’t accept foods other than purees, the lateral movement pattern can be practiced by placing purees over the molar surface so that the tongue will shift to either side of the mouth to accept the food, and then to transport the food to the back of the mouth in preparation for a swallow. Foods such as lollipops or lifesavers on a string can be presented to the child to practice moving the tongue from midline, to side and across midline so that the tongue practices moving food within the oral cavity. The meltable foods, such as cereals, can be placed over the molar surface for the tongue to get and then move over to the other molar for several sequences before softening, chewing and swallowing. As the child becomes more facile with this technique, foods are added into meals to practice these patterns for entire meals or for therapeutic meals.

Swallowing. Shifting from a sequential swallowing pattern to a single bolus swallow in spoon-feeding can be practiced using the spoon. Many therapists are taught to use Nuk brushes and other similar implements to present tastes and foods to children that refuse foods. Since we use a spoon to eat with, practicing the oral-motor pattern needed with the appropriate utensil will lead to more efficient learning.

To facilitate a single bolus swallow, the entire bowl of a dry spoon can be placed on the tongue applying downward pressure to encourage the tongue to make a bowl then move back to initiate a swallow. If the child does not close his lips around the spoon, he is asked to and/or his lips are closed around the spoon to learn the correct sequence (Chigira, Omoto, Mukai, & Kaneko, 1994). All presentations of the spoon should be done with the child’s head in a neutral position and with him facing forward. Since there is no food on the spoon and no threat of aspiration, he is learning the correct sequence of movement for a single bolus swallow in a safe manner using the utensil that is used for feeding. As he becomes more proficient with this pattern, a small amount of food is placed on the spoon. The amount of food on the spoon is increased gradually until he can accept a level spoonful of food while always ensuring that he is continuing to exhibit the appropriate oral-motor pattern.

Grading Jaw Movement. Some children have difficulty grading the amount of mouth opening and closing needed for a variety of foods. When a child demonstrates wide jaw excursions, he will have difficulty using his tongue to manage the food. Providing jaw stability by placing your hand under the jaw will help the child to take bites and to keep the mouth closed while the tongue does the work of manipulating the food. As the child practices, thinner foods can be placed between the molars to chew using minimal jaw excursions.

Empirical Support for Oral Stimulation and Oral-Motor Therapy

Oral-Motor Therapy

While the majority of published studies report on the efficacy of oral-motor therapy for high-risk infants born prematurely or children with neuromotor difficulties, a few case studies suggest the promising use of oral-motor treatment techniques for children with low muscle tone (Kumin, Von Hagel, & Bahr, 2001) and retardation/autism (Larrington, 1987).

High-Risk Infants. Sensorimotor interventions (e.g., proper positioning and external support of the cheeks and mandible during bottle feeding) improve oral feeding of preterm infants (Case-Smith, 1988; Einarsson-Backes, Deitz, Price, Glass, & Hays, 1994). Using a two-group design, Gaebler and Hanzlik (1996) compared 5 minutes of pre-feeding stroking to 5 minutes of pre-feeding stroking and introral prefeeding stimulation in a sample of 18 premature infants. Assessments occurred on days 1, 3 and 5; the group that received oral stimulation fed significantly better than the control group on day 3 only. A more recent study has demonstrated that those preterm infants who received daily 15-minute oral
stimulation program consisting of stroking the peri- and intraoral structures for 10 days before the start of oral feedings, achieved full oral feedings seven days sooner than the infants in the control group (Fucile, Gisel, & Lau, 2005). In addition, infants in the experimental group demonstrated greater overall intake, rate of milk transfer, and amplitude of the expression component of sucking. In contrast, there were no differences between experimental and control infants on sucking stage maturation, sucking frequency, amplitude of the suction component of sucking or endurance of sucking.

Children with Neuromotor Disorders. An elegant series of studies investigating sensorimotor intervention on eating skills of children with cerebral palsy (average age ~ 5 years) has been conducted by Gisel and colleagues (Gisel, 1994; Gisel, Applegate-Ferrante, Benson, & Bosma, 1995, 1996). Oral-motor therapy, which was designed to increase tongue lateralization, lip control, and vigor of chewing, was delivered before the lunch meal for 5-7 minutes/day, 5 days/week for 10-20 weeks. Using a between subject experimental design, children’s spoon feeding, biting, and chewing improved with oral-motor therapy (Gisel, 1994). Using a within-subject design, spoon feeding, chewing, and swallowing improved after oral-motor therapy (Gisel et al., 1996). In addition, more children advanced food texture with oral-motor therapy (Gisel et al., 1995). One interesting finding was the discovery that eating efficiency (i.e., meal duration) was not a good outcome measure but rather is a diagnostic indicator of the severity of the feeding impairment.

A relatively new type of intervention for oral-motor difficulties in children with neuromotor impairments is an intraoral appliance, Innsbruck Sensorimotor Activator and Regulator (ISMAR; Gisel, Schwartz, & Haberfellner, 1999). The ISMAR was designed to achieve two goals: 1) jaw stabilization, and 2) activation/mobilization of the oral and pharyngeal structures. Although there were some difficulties in achieving tolerance and compliance with ISMAR (see Johnson et al., 2004), children with neuromotor disorders demonstrate significant improvements in spoon-feeding, biting, chewing, cup drinking, swallowing, and drooling after one year of ISMAR (Haberfellner, Schwartz, & Gisel, 2001; Johnson et al., 2004). These functional changes in feeding skills appear to be a function of jaw stabilization. Furthermore, these improvements in feeding were maintained for one year after ISMAR therapy was stopped (Gisel, Haberfellner, & Schwartz, 2001). Finally, use of ISMAR was associated with significant improvements in sitting and ambulation providing preliminary evidence for the dynamic interplay among oral-motor, postural, and ambulatory functions (Gisel et al., 2000).

Behavioral Interventions Targeting Oral-Motor Problems

Within the field of applied behavior analysis, several researchers have designed interventions using behavioral principles to improve specific oral-motor problems, such as swallowing dysfunction (Hagopian, Farrell, & Amari, 1996; Hoch, Babbitt, Coe, Duncan, & Trusty, 1995; Lamm & Greer, 1988), cup drinking (Patel, Piazza, Kelly, Ochsner, & Santana, 2001), and failure to advance texture (Luiselli & Gleason, 1987; Shore, Babbitt, Williams, Coe, & Snyder, 1998). The hallmark of all these interventions is 1) analyzing the “task” into small, discrete steps, 2) manipulating the antecedent condition by presenting food or liquid in a way that allows the child to complete the behavior expected successfully, and 3) clear consequences for completing or not completing the task. For example, in the swallowing induction procedures, swallowing was broken down into its component steps from food entering the mouth to the initiation of the swallowing reflex at the faucal arches. The researchers used forward or backward chaining with prompts (verbal and physical prompts on the tongue) to initiate swallowing. Although the data suggest that the intervention is promising (Kerwin, 1999), the technique assumes competent oral-motor tongue and jaw movements. Although the children had increased swallow frequency, increased food acceptance and increased quantity of food consumed orally, it is unclear from the study results if the oral-motor pattern acquired indirectly would allow the child to continue advancing oral-motor skills with other food textures. The current research literature suggests that a more expedient intervention might be direct targeting of the oral-motor movements.
Combined Use of Oral-Motor Therapy and Behavioral Techniques

Successful eating requires effective oral-motor patterns. The behavior analyst can be instrumental in assisting members of other disciplines in teaching children these skills. Because behavior analysts are skilled in task analyses, they can also help members of the other disciplines task analyze their interventions and learn to look for and document specific responses that they expect from each procedure (see Kumin et al., 2001 for example of task analysis of oral-motor treatment). Perhaps an ideal avenue for future investigation is combining the best of both approaches together to maximize the child’s benefit from systematic, gradual steps with clear instruction and consequences in the context of meaningful oral-motor facilitation and therapy (Bailey & Angell, 2005). Peterson and Ottenbacher (1986) demonstrated this combined approach in teaching lip closure to three children with mental retardation.

Conclusion

Children requiring early, intensive intervention often have complex feeding and swallowing issues that require a team approach in order to fully evaluate and treat the underlying issues. Low tone, abnormal sensory processing, altered postural alignment and movement patterns are often present in these populations. These issues place them at risk for having abnormal postural alignment of the pelvis, trunk, shoulder girdle, which leads to a forward head posture. This alters the biomechanics of breathing and swallowing and the corresponding sensory input. With altered sensory perception the child may have difficulty motor planning postural alignment and control for acquisition and mastery of feeding and swallowing behaviors. Once medical stability and postural alignment have been obtained, oral stimulation can be an effective adjunct to feeding treatment. Oral stimulation should provide the child with the necessary sensory and movement input to adequately prepare the child for controlled practice with food. The use of varying foods in multiple therapeutic practice situations a day is the key to increasing the frequency of positive practice and thus increasing the acceptance of variety and volume of foods consumed in children exhibiting oral-motor difficulties.

References


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An Operant Analysis of Joint Attention Skills

Per Holth

Abstract

Joint attention, a synchronizing of the attention of two or more persons, has been an increasing focus of research in cognitive developmental psychology. Research in this area has progressed mainly outside of behavior analysis, and behavior-analytic research and theory has tended to ignore the work on joint attention. It is argued here, on the one hand, that behavior-analytic work on verbal behavior with children with autism needs to integrate the research body on joint attention. On the other hand, research on joint attention should integrate behavior-analytic principles to produce more effective analyses of basic processes involved. An operant analysis of phenomena typically considered under the heading of joint attention is followed by examples of training protocols aimed at teaching joint attention skills, such as social referencing, monitoring, gaze following, and such skills interwoven with mands and with tacts. Finally, certain research questions are pointed out.

Keywords: Joint attention, Language training, autism.

During the last 25 years, there has been an increasing preoccupation with ‘joint attention’ as a crucial area in children’s ‘social-cognitive development.’ Research has focused on normative patterns of emergence of joint attention skills (e.g., Corkum & Moore, 1995) and on how such skills are related to later developing skills summarized as ‘symbolic abilities’ (Hobson, 1993; Mundy, Sigman, & Kasari, 1993), ‘language abilities’ (Baldwin, 1995; Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Bruner, 1975; Tomasello, 1988), and ‘general social-cognitive processes in children’ (Baron-Cohen, 1995; Bruner, 1975; Mundy, 1995; Tomasello, 1995). Moreover, it appears that children diagnosed with autism may display a syndrom-specific deficit in joint attention skills (e.g., Baron-Cohen, 1989, Mundy & Crowson, 1997; Sigman & Kasari, 1995; Sigman, Kasari, Kwon, & Yirmiya, 1992). It seems strange, then, that behavior analysts, and even those working in the field of autism, have not paid much attention to the work on joint attention.

Research within the cognitive-developmental tradition has typically focused on identifying characteristic patterns of responding in different groups of children and on the consistency of responding across situations and over time (cf., Moore & Dunham, 1995). In spite of the fact that the whole body of “cognitive” research on joint attention focuses on behavior that needs to be analyzed in great detail, this field appears to have developed almost completely apart from behavior analysis. Some researchers have even argued specifically against behavior-analytic interpretations in this area (e.g., Bruner, 1995; Tomasello, 1995).

Recently, however, other researchers have occasionally called for some joint ventures of traditional joint-attention researchers and behavior analysts in an effort to develop intervention programs that might effectively remedy joint attention deficiencies in children with autism (e.g., Mundy, 2001; Mundy & Crowson, 1997).

The general aim of the present article is to show that an operant analysis is basically relevant to research on joint attention and to the aim of developing procedures that might help remedy basic deficiencies in joint attention typically displayed by children with autism. Specific aims of the current presentation are (1) to decompose the concept of joint attention sufficiently to make it amenable to an operant analysis, (2) to show how certain well-established basic behavioral processes can be utilized in interventions that attempt to correct deficiencies in joint attention skills in children with autism, and (3) to outline additional basic operant research that is needed in order to account for the variables of which joint attention skills are a function.

The concept of ‘joint attention’

Issues treated under the heading of ‘joint attention’ range from the early work by Bruner and colleagues on gaze following (e.g., Scaife & Bruner, 1975) to issues related to children’s so-called development of a “Theory of Mind” (e.g., Baron-Cohen, 1991; Mundy, Sigman, Ungerer, & Sherman,
1986). Therefore, ‘joint attention’ may not be particularly useful as a technical term unless the diversity of phenomena currently referred to by the concept prove to covary as a unitary phenomenon. In order to evaluate the concept as such, we need to analyze the different behavioral phenomena now listed as examples of ‘joint attention.’ Before turning to an overview of some of the phenomena typically treated within this realm, let me just briefly consider some attempted definitions.

**Defining ‘joint attention’**

According to Baldwin (1995), “technically speaking, joint attention simply means the simultaneous engagement of two or more individuals in mental focus on one and the same external thing” (p. 132). Very often, however, a lot more may be implied by ‘joint attention.’ Sigman and Kasari (1995) distinguished between a narrow and a broad definition of ‘joint attention.’ The narrower definition refers simply to “looking where someone else is looking.” Their broader definition includes what they called “responsive and initiating behaviors as well as the checking of another person’s face that occurs while the infant is playing with something, when the infant has accomplished some task, after the infant has pointed to something, or in an ambiguous situation” (p. 189). Further, according to Bruner (1995), “joint attention involves knowing that another is looking at and experiencing something in the visual world” (p. 7). Tomasello (1995) includes in his definition that “both participants are monitoring the other’s attention to the outside entity,” and that “the coordination that takes place in joint attentional interactions is accomplished by means of an understanding that the other participant has a focus of attention to the same entity as the self” (p. 105-107). Finally, Sarria, Gomez, & Tamarit (1996) observed that although joint attention “typically refers to coordination of visual attention, . . . [it] may be achieved through other sensory modalities, such as vocalizations or physical contact” (p. 49).

In *A Preliminary Manual for the Abridged: EARLY SOCIAL COMMUNICATION SCALES (ESCS)*, Mundy, Hogan, & Doehring (1996) suggested that “the function of [joint attention] behaviors is to share attention with the interactive partner or to monitor the partner’s attention. They differ from Requesting bids in that they do not appear to serve an instrumental or imperative purpose.” However, it is clear according to Corkum & Moore (1995), “joint attention plays an integral part in both the protodeclarative and protoimperative gestures” (p. 64).

Although empirical studies usually rely on some narrower operational definition of joint attention such as those specified in the ESCS by Mundy et al. (1996), people working in this area seem to agree that the concept of ‘joint attention’ implies something in addition to those operationalized skills. This additional implication has been described as “knowing that another is looking at and experiencing something in the visual world” (Bruner, 1995, p. 7), “understanding that the other participant has a focus of attention to the same entity as the self” (Tomasello, 1995, p. 107), or “the recognition that mental focus on some external thing is shared” (Baldwin, 1995, p. 132). Such “knowing,” “understanding,” or “recognition” is, of course, harder to specify. Dunham and Moore (1995) predicted that research will, eventually, lead to the decomposing of joint attention into “the series of transformations that are presumably occurring in social cognition across developmental time” (p. 23). From a behavior-analytic perspective, a decomposition may be required in order to bring the phenomena under investigation within reach of its scientific principles.

**Phenomena treated under the heading ‘joint attention’**

In order to take on the task of pinpointing the behavioral phenomena of which such phenomena can consist, let us start by delineating some of the cruder categories that are typically conceived of as involving ‘joint attention.’ These include ‘gaze following,’ ‘social referencing,’ ‘protoimperative gestures,’ ‘protodeclarative gestures,’ and ‘monitoring.’

(a) Look or gaze following. Perhaps the simplest examples of joint attention skills are those referred to as ‘responsive joint attention,’ in which one looks where someone else is pointing or touching (following proximal point/touch) or is looking in the direction of someone’s gaze or beyond the end of someone’s index finger (following line of regard; see Mundy, Hogan, & Doehring, 1996). However, not even in these cases is
joint attention a purely formal class. As pointed out by Tomasello (1995), there are two common types of adult—child interactions that may look like joint attention, but which lack the criterion of “knowing,” “understanding,” or “recognition.” These are “onlooking” and “cued looking,” in which something may catch the attention of two people simultaneously, but without one person’s attention influencing the other person’s attention.

(b) Social referencing. When confronted with some novel stimulus, a child (typically) will look toward a familiar person and subsequently react to the novel stimulus in accord with the displayed expression of the familiar person. As in the case of gaze following, however, joint attention in such ‘social referencing’ requires that the child “understands” that the familiar person is attending to the same thing or event as the child attends to. If, for instance, the child simply looks to a familiar person as a kind of ‘comfort seeking,’ this will not count as ‘joint attention’ (cf. Baldwin, 1995).

(c) Protoimperative. Protoimperative gestures have been described as “gestures intended to make another person do something for one’s benefit” (Sarriá et al., 1996). However, a simple contingency between a gesture and a ‘beneficial effect’ can occur without ‘joint attention.’ Sometimes, the term ‘protoimperative’ has been preserved for cases that involve some type of “coordination of attention with other people” (Sarria et al., 1996). In accord with this, Tomasello (1995) wrote: “My interpretation of protoimperative pointing in the 12- to 14-month period, therefore is that the child is attempting not just to obtain the object but to change the adult’s intentions so as that they become aligned with its own” (p. 111).

(d) Protodeclarative. Bates, Camaioni, and Volterra (1975) defined the protodeclarative as a preverbal effort to direct other’s attention to an object or event. Tomasello (1995) interpreted the protodeclarative as having “the purely social motive of sharing attention to something” (p. 111).

(e) Monitoring. Gaze or attention monitoring can take place in a simple responsive manner, as it certainly does when we are just observing other people, as in a movie. However, such monitoring can be interactive and involve acting to influence the other person’s attention. It appears that an emerging criterion for using the term ‘joint attention’ or ‘true joint attention’ in all types of cases mentioned above is exactly the interactive monitoring of another person’s attention. In developmental psychology, researchers have tried to capture the essence of ‘joint attention’ in social-cognitive terms.

Why behavior analysts should study joint attention

There are, at least, three specific, good reasons why behavior analysts should be interested in studying performances typically grouped under the heading of “joint attention.” We will explore each in this section.

First, because children diagnosed with autism seem to display a syndrome-specific deficit in joint attention skills (e.g., Baron-Cohen, 1989, Mundy & Crowson, 1997; Sigman & Kasari, 1995; Sigman, et al., 1992), outcome studies of applied work with children with autism should include measures of relevant joint attention skills. Until intervention studies (e.g., Lovaaas, 1987; McEachin, Smith, & Lovaaas, 1993) include outcome measures that address the cardinal social and social-cognitive symptoms of the syndrome, their results will remain open to the criticism that no children have been shown to even nearly “recover” from autism. Even the best-outcome children of behavioral interventions, who do demonstrate major gains on measures of IQ and social development, may continue to exhibit equally important difficulties on specific social and cognitive skills (Mundy & Crowson, 1997).

Second, because research has linked joint attention skills to later developing ‘symbolic abilities’ (Hobson, 1993; Mundy, Sigman, & Kasari, 1993), ‘language abilities’ (Baldwin, 1995; Bates et al., 1979; Bruner, 1975; Tomasello, 1988), and ‘general social-cognitive processes in children’ (Baron-Cohen, 1995; Bruner, 1975; Mundy, 1995; Tomasello, 1995), the development of intervention technologies specifically aimed to produce joint attention holds the potential of a significant breakthrough in interventions for children with autism.
Third, some cognitive psychologists have insisted that joint attention is not amenable to a learning explanation and that behavior analysis is essentially irrelevant to this field of inquiry (e.g., Bruner, 1995; Tomasello, 1995). The demonstration of how basic behavior principles may be involved in the establishment of phenomena treated under the heading of ‘joint attention’ will be a substantial support to behavior-analytic view that the role of behavior principles in ‘psychological development’ has been vastly underestimated in the field of developmental psychology.

As noted by Schlinger (1993), “developmental psychologists have provided valuable information about child development. Unfortunately, such information lacks a strong unifying theoretical background and fails to impart practical knowledge that can enable psychologists to reliably change behavior in natural settings” (p. viii). In many recent psychology textbooks and articles, the discussion of learning, not to mention behavior analysis, is almost nonexistent, and even when sections on learning principles are included, authors rarely refer back to these principles in analyses of complex phenomena. It is quite astonishing to observe that not even the basic, well-documented principle of operant reinforcement is incorporated in developmental psychology. In order to more fully appreciate the potential of an operant analysis of joint attention phenomena, some knowledge of behavior principles and technical terms are required. These will be briefly outlined here.

**Behavior principles and some technical terms**

A widespread misconception suggests that behavior analysis confines itself to what can be directly observed and to responses that result from a direct conditioning history. For instance, according to Bruner (1973) there is a tradition in psychology that prefers to stop at the level of behavior, dispensing with notions like intention, “but it is a necessity for the biology of complex behavior, by whatever label we wish to call it” (p. 2). The field of “intention” is, of course, the very field of operant behavior. An operant analysis will never stop at the level of behavior, by whatever label we may wish to call it. On the contrary, an operant analysis will instantly move on to the variables of which the behavior is a function.

**Operant reinforcement**

Whenever, colloquially speaking, someone *intends* to obtain an *effect*, we could say that the behavior *operates upon the environment* (social or otherwise) to produce that effect. The operant reinforcement principle is likely to be, at least partly, familiar to researchers in developmental psychology: When behavior is followed by certain consequences, the frequency of such responses increase as a result. Basic behavioral research has amply demonstrated the robustness of the reinforcement principle in human as in other animal behavior. Even so, authors sometimes reject a behavior-analytic view as “less plausible” and assert that some of the coordinated action in ‘joint attention’ is just an unlikely candidate for the conditioning explanation. For instance, Tomasello (1995) contended that:

. . . while the conditioning explanation can never be ruled out completely, children’s spontaneous gaze alternations, and the way they are coordinated with their ongoing social interactions at around 12 months of age, makes less plausible the conditioning explanation and more plausible the view that the child understands that the adult is a separate person who has intentions and attention that may differ from its own. (p. 109)

However, that the child “understands that the adult is a separate person” only sums up the current structure of behavior-environment relations and obviously does not preclude the relevance of a conditioning history. ‘Understanding’ can be considered as a summary label for complex sets of performances, but it does not point to independent variables of which performance is a function.

**Operant discrimination**

In an operant analysis, ‘attention’ boils down to ‘stimulus control.’ Whenever, in colloquial terms, we
say that a child attends to something, behavior analysts will move on to specify the child’s behavior that is controlled by that something. Why, then, would anyone prefer such a technical vocabulary? There is good reason for the focus on relations between behavior and events in the environment. When that is accomplished, a large body of research literature on how to establish and change stimulus control becomes directly relevant to our work in this field. This literature includes work on simple stimulus control (e.g., Herrick, Myers, & Korotkin, 1959; Blough, 1958; Reynolds, 1961), compound stimulus control (cf. Dinsmoor, 1995; Donahoe & Palmer, 1994), simultaneous and successive discrimination (e.g., Loess & Duncan, 1952; Zentall & Clemet, 2001). More recently, there is a growing body of experimental research on more complex stimulus control, to be noted below.

Conditioned reinforcement and behavior chains

There is sometimes a preconception regarding what can reasonably function as a reinforcer. For instance, some have indicated that on the basis of the observations of “how social or sharing or reciprocal such attentional activity is . . . it was . . . inevitable that we grew uncomfortable with learning theory explanations of how eye-to-eye contact came into being, or how it shifted over to shared attention on common objects. With respect to the former, there were even studies indicating that eye-to-eye contact itself was reinforcing in learning tasks” (Bruner, 1995, p. 2). Similarly, according to Tomasello (1995), “in [the case of declaratives] the child simply shows or shares something with an adult, which would not seem amenable to a conditioning explanation as there are no apparent rewards involved.” Although he admits that “if human beings are rewarded by smiles and other signs of acknowledgement from adults, then they might be conditioned in their use of protodeclaratives as well,” he adds that “this stretches the conditioning explanation somewhat out of shape” (p. 111). Why this should be stretching the conditioning explanation somewhat out of shape is not explained, and I can think of no other reason for this suggestion than some sort of preconception of what can possibly function as reinforcers, for instance couched in terms of a drive-reduction theory (cf. Chomsky’s 1959 review of Skinner’s *Verbal Behavior*).

The consequences of behavior that can function as reinforcers can be either: (1) purely material things, (2) social stimuli, or (3) stimuli correlated with access to other (high-probability) activities (i.e., the Premack Principle). Further, some reinforcers function as such without requiring any type of prior “learning,” while others come to function as such only after they appear in certain types of relation to other reinforcers.

Although the details of the principles involved in the establishment of new, conditioned, reinforcers may still need to be explored in some detail (cf. Fantino & Logan, 1979) we do know a lot about how to establish new things or events as reinforcers. The standard procedure that is suggested in the literature of applied behavior analysis (e.g., Lovaas et al., 1981; Maurice, Green, & Luce, 1996) is a “pairing” of stimuli that one wants to establish as conditioned reinforcers with unconditioned or primary reinforcers. A safer, and possibly more effective, procedure is to establish the new, to-be-conditioned, reinforcer as an $S^O$ for a response that produces the unconditioned reinforcer (e.g., Dinsmoor, 1950; Keller & Schoenfeld, 1950; Lovaas, Freitag, Kinder, Rubenstein, Schaeffer, & Simmons, 1966; Skinner, 1938). Behavior chains will then build up, in which the reinforcing consequence of one behavioral element constitutes the occasion for other behavior which typically produces reinforcement.

Generally, the effectiveness of conditioned reinforcers will depend on the presence of the establishing operation (e.g., deprivation) that the primary reinforcement effect depends on. However, if the conditioned reinforcer obtains its effect through a similar relation to a number of different primary reinforcers, it will become a *generalized conditioned reinforcer*. The effectiveness of such reinforcers is less dependent upon each specific establishing operation upon which each of the unconditioned reinforcers may depend.

Conditional discriminations

The three-term contingency $S^O \rightarrow R \rightarrow S^R$ is, perhaps, the most robust behavior-analytic formula, but behavior analysis is not limited to it. The three-term contingency can be placed under conditional or contextual control: A response may be followed by a reinforcing event in the presence of a particular stimulus,
but this relation may hold only in the presence of some additional stimulus (e.g., Sidman, 1986). For instance, you may dial a telephone number in front of you to produce the voice of some interesting person, but only when the dialing tone is present first. Similarly, in many social settings, responding to certain features in the environment will be reinforced by other people, but only when they, too, attend to those features of the environment as well. Features of conditional discrimination training have been studied in great detail over the last 20 years and have been reported in the literature on stimulus equivalence (e.g., JEAB, 1996; Sidman, 1994).

Joint control

Sometimes, behavior depends on the simultaneous, or joint, control by two different stimuli over a single response (e.g., Lowenkron, 1998). For instance, if somebody requests a 14 mm socket, you may repeat “14mm” as you scan a number of sockets until you see one which controls the same response (saying “14 mm”), such as one with “14mm” printed on it, before you stretch out and pick up that socket. In social interactions, when you try to locate an object or event to which another person attends, it may be helpful if you are told a name or otherwise given a description of that object or event. You may then visually scan the environment until you see something that controls the same verbal response in you. In the absence of a verbal description, you may simply respond, at least in part, like you observe the other person to do, and scan the environment in that other person’s visual field until you see something that controls that same response (e.g., smiling or frowning) in you.

Conjugate reinforcement

Reinforcement is not just an on-or-off issue. In what has been termed ‘conjugate reinforcement,’ there is a contingent relation between the intensity (e.g., frequency) of the response and the intensity of some continuously available stimulus, and changes in the intensity of the continuously available stimulus functions as a reinforcer. (e.g., Lovitt, 1967; Rovee-Collier & Gekoski, 1979). Much of what may function as social reinforcers, such as other persons’ attention may often not be an on-or-off matter, but a matter of intensity typically related to an intensity of responding. For example, when guiding someone else’s attention, we may be sensitive to small changes in the direction of the person’s looking in the right or wrong direction.

Continuous repertoires

Sometimes reinforcement is contingent upon a correspondence between response dimensions and stimulus dimensions, as in what has been referred to as continuous fields (Skinner, 1953). Such continuous fields may lead to continuous repertoires in which intermediate values on the stimulus dimension control intermediate values on the response dimension, and extreme values on the stimulus dimension control corresponding extreme values on the response dimension (Wildemann & Holland, 1972). Crude gaze following, for example, may result from the direct training of only a limited number of different exemplars.

Observing responses

Organisms are, of course, not only passively exposed to stimuli. They operate on the environment as if “gathering information” relevant to the issue of how to respond next. However, “gathering information” may not accurately describe the function of such behavior. In an experiment on observing behavior by Dinsmoor (1983), pigeons were exposed to a multiple schedule in which pecks on one key were extinguished in the presence of a red light and reinforced according to a variable ratio schedule in the presence of a green light. Under such circumstances, key pecking that produce either green or red light (that is correlated with reinforcement and nonreinforcement, respectively) will be maintained. In terms of information value, the red light and the green light should be equal. However, if responses on the observation key only produces green light when the reinforcement schedule operates, pecking the observation key is maintained, whereas if only the red light is produced when the extinction schedule is operating, responding to the observation key is not maintained (Dinsmoor, 1983). To the extent that this finding can be extrapolated to human behavior, monitoring the behavior of other persons is best maintained when some properties of their behavior serve as
positive discriminative stimuli, i.e., occasions for doing something that produces a reinforcing event. Correspondingly, such monitoring may not be well maintained when distinct properties of the other person’s behavior mainly function as negative discriminative stimuli ($S^D$) in the presence of which behavior is not reinforced.

An operant analysis of joint attention performances

In colloquial terms, joint attention can be said to involve the detection of what another person attends to. A fairly general principle seems to be that people particularly attend to things, events, or properties that are novel. Such preference for novel stimuli is well documented even in infants and utilized in experiments on so-called “recognition memory” using habituation procedures (e.g., Bornstein, 1976), paired-comparison (novelty preference) procedures (e.g., Fantz, 1964), or novelty discrimination procedures (e.g., Werner & Siqueland, 1978). Further, when it comes to verbal skills and listening skills, people tend to report on deviations from standard patterns of events and to listen to such reports with more interest than in reports on routine events or things that do not change, except when invariability itself is novel. Obviously, novelty does not exist by itself but only as a property of the history of each person with respect to particular things and events. Although some types of events are likely to be novel to most people, a detailed knowledge of what is novel to, and likely to exert stimulus control over some perceptual behavior of, a particular person will require a more detailed knowledge of the history of that person.

An operant analysis of gaze following.

Mundy et al. (1996) distinguished between a lower and a higher level of responding to joint attention. Lower level behavior consists of orienting head and eyes in accord with another person’s proximal point or touch. Higher level behavior involves following someone’s line of regard (beyond the index finger if pointing is involved) to some object or event.

In behavior-analytic terms, the lower-level behaviors can occur as standard discriminated operants – the product of a standard three-term contingency: The adult’s pointing or touching is the occasion upon which looking in that direction is typically followed by reinforcing consequences. These reinforcing consequences may very well be purely visual.

Higher-level performances can involve very much more complex skills. As Bruner (1995) pointed out, the child’s action must not only be started by the adult’s gaze, but it must also stop “when the infant finds a visual target out there” (p. 7). A relatively simple version of a higher-level behavior could consist of a two-component behavior chain in which an adult’s gaze in a particular direction serves as a discriminative stimulus for the child’s turning the head/eyes to look in that general direction. In that vicinity, something irregular is happening which functions simultaneously as a conditioned reinforcer for turning the head/eyes and as an $S^D$ for visual focusing and further looking. However, if the child, eventually, focuses on something for reasons totally apart from what the adult was initially attending to, this may not fulfill the stricter criteria of true joint attention adhered to by some authors. In true joint attention, the child must focus (and stop scanning) not just dependent upon seeing something that singularly reinforces the child’s seeing, but which is likely also to have functioned as an $S^D$ for the adult’s look. In traditional terms, then, we want to know the basis on which the child determines what the adult is attending to. More specifically, the child may focus (and stop scanning) when looking is jointly controlled by the adult’s gaze and some novel or irregular thing or event.

An operant analysis of ‘social referencing’.

Simple forms of social referencing may be built up similarly to observing behavior as studied in the laboratory (e.g., Dinsmoor, 1983). Again, if true joint attention is involved in the sense that the child can be said to “understand” that the familiar person attends to the same event as the child does, the principle of joint control must be involved. Hence, social referencing with joint attention requires that the child behaves in accord with the behavior of the familiar person towards a novel stimulus, but only contingent upon an event.
of joint control in which the child could be said to infer that the familiar person’s behavior is controlled by the same novel event as the child’s own behavior.

An operant analysis of the ‘protoimperative’.

A definition of protoimperative gestures as “gestures intended to make another person do something for one’s benefit” (Sarriá et al., 1996) may correspond closely to Skinner’s preliminary definition of a mand as “a verbal operant in which the response is reinforced [through the mediation of other persons] by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation” (Skinner, 1957, pp. 35-36).

Protoimperatives (or mands) can also occur without features of joint attention. A child may simply persist in doing what has previously produced reinforcers through the mediation of other persons without otherwise being sensitive to whether or not anyone attends at the moment. However, protoimperatives usually work more smoothly and reliably when the child engages in observing behavior that establishes another person’s attention to what the child is pointing at.

An operant analysis of the ‘protodeclarative’. Whereas protoimperatives correspond to Skinner’s (1957) definition of a mand, protodeclaratives may correspond to a rudimentary version of a tact, which is established by reinforcement “with many different reinforcers or with a generalized reinforcer” (Skinner, 1957, p. 83). Specifically, “the purely social motive of sharing attention to something” (Tomasello, 1995, p. 111), may imply that behavior is typically reinforced by social consequences, such as other persons’ nods, smiles, visual orienting, uttering “yes,” “oh,” “look at that,” or other relevant comments that in Skinner’s (1957) terminology constitute intraverbals. Thus, joint attention is central to the ‘protodeclarative’ in the sense that the joint attention of other persons constitutes the reinforcement that characterizes this function.

An operant analysis of monitoring

Instead of just responding to discrete instances of other persons’ looking or pointing, a child may “keep an eye on” someone in order to detect such instances. As lower-level joint attention, such continuing observing behavior, or vigilance, may be automatically and abundantly reinforced when the child is monitoring parents or others who may be particularly qualified at focusing on events that may reinforce the child’s perceptual behavior. On the other hand, true joint attention in such monitoring would seem to require a contingency of the type that characterizes the ‘protodeclarative’ or tact and involve similar social reinforcers.

In sum

The present operant interpretation of joint attention skills points out seven basic factors. (1) In social interactions that involve visual joint attention, the visual orienting of one person is under discriminative control of the pointing or visual orienting of another person. (2) Such discriminative control may be conditional upon other stimuli. For instance, such point or gaze following may be particularly likely in the presence of certain facial expressions, when someone says “Look!” or when you have asked for directions. (3) In a three-dimensional world, a great many different objects, events, or properties of objects and events may exist in the direction of someone’s look, so that identifying the particular stimuli at which someone else is focusing must be jointly controlled by the direction of the look and something else. (4) Both the extent to which someone follows another person’s orienting, and the extent to which one operates to get others to follow one’s own orienting depends on previous consequences of such behavior. (5) When one directs the attention of someone else, small changes in the right direction may function as reinforcers, and when following someone else’s direction, a novel stimulus may, typically, function as a reinforcer. (6) In both cases, the reinforcers may have gained in strength because they are typical precursors of the moment of joint attention which, in turn, constitutes an occasion upon which other behavior (e.g., verbal behavior) is likely to be reinforced. (7) A limited number of exemplars of successfully following and directing others’ attention may
suffice to produce a continuous repertoire of such joint attention skills.

Advantages of an operant analysis: Implications for the applied field

Generally, the focus on accessible variables in behavior analysis makes it directly applicable to practical issues. Having found that “joint visual attention is not spontaneously demonstrated by infants until about 10 months of age” and that, “given the appropriate feedback infants are able to acquire a gaze-following response from about 8 months on,” Corkum and Moore (1995, p. 78) concluded that “learning is a possible mode of acquisition for joint visual attention.” Such acceptance of “learning as a possible mode” may be a first step towards an analysis of the variables of which joint attention skills are a function. If joint attention skills are amenable to an operant analysis, learning protocols aimed at the establishment of such skills appear to be a rather straightforward matter. Here are some examples:

1. Social referencing: Establishing normal social stimuli as reinforcers

If social stimuli that function as reinforcers for behavior in most people, including children, do not do so for behavior in children with autism, a crucial step may be to establish such events as reinforcers. The following outline of a training procedure will focus on establishing others’ nodding and smiling as reinforcers.

Training: Trainer and child are seated face-to-face at opposite sides of a table. Spread approximately 10 small edible reinforcers around the table. Any attempt from the child to take pieces from the table should be blocked. When the child sits quietly, nod and smile before you let the child take one item. If the child does respond, repeat the nod and smile, and prompt the child to take one item from the table. Then, as long as you do not nod and smile, block any attempts the child may make to take things from the table, and when you nod and smile, let the child take another item, and so on. Let the time vary between each time you nod and smile. When the child takes items from the table only immediately following your nods and smiles, this constitutes a simple version of social referencing. Further, it is appropriate to say that your nods and smiles function as an S^D for the child’s response in taking items from the table, which is also a reliable indication that your nods and smiles will function as a conditioned reinforcer for any behavior in the child that produce your nods and smiles as consequences. An early change in the child’s behavior will be an obvious increase in the child’s visual attention to your face. Your nods and smiles can then be utilized to establish useful social behavior in the child, such as calling your name and, later, directing your attention to other objects and events.

Clearly, the simple procedure described above is only a start, and a large number of problems remain and will have to be solved. First, your nods and smiles are likely to function as reinforcers only when those edible reinforcers are visible at the table. Second, although your nods and smiles now function as a conditioned reinforcer, they will not be generalized: They will only function as reinforcers as long as those edibles are reinforcing, i.e., as long as relevant deprivation is maintained. Third, nods and smiles by others than the trainer may still go unnoticed by the child. Fourth, in addition to nods and smiles, other persons’ uttering “yes,” “oh,” “look at that,” and other relevant comments (intraverbals) will also need to be established as conditioned reinforcers in order to establish a general interest in the normal social consequences of engaging in standard “communication.”

2. Establishing monitoring

Additional monitoring may be established effectively by having the child actively guiding someone else’s behavior through several steps that are necessary in order for the child to make that other person locate and deliver a reinforcer. An example of a sequence of relevant tasks is the following: First, attach envelopes, say 5-6, on a horizontal line on the wall. Let the child sit and watch from a distance of 3-4m that someone puts some snack (or other potential reinforcer) into one of the envelopes. Then, tell the child to instruct you on where to find the snack for him or her. Start pointing to some random envelope and have the child prompted to guide you by pointing further to the left, further to the right, or by saying “stop” as your pointing
finger moves before the envelope in which the reinforcer is located. In a second version of the task, have the envelopes arranged in a vertical row and have the child guide you by pointing further up, further down, or saying “stop”. Next, combine the tasks by having envelopes pasted over a large area on the wall. In more advanced version of the task, the child may be taught to specify in more detail how you should move from your current pointing position, such as “next one to the right and two up!” Let the child confirm that you have the right position by saying “stop” or “yes, that’s the one” before you pick up the reinforcer, and to make “mistakes” occasionally, so that the child cannot successfully relax his/her monitoring of your behavior.

3. Establishing gaze or point following

Pretaining: Trainer and child are seated face-to-face at opposite sides of a table. The trainer shows the potentially reinforcing stimulus to the child, asks the child to turn around (or otherwise makes sure that the child cannot observe), puts a potentially reinforcing stimulus under one of two opaque cups turned upside down on the table. Next, the trainer says “ready” and makes sure that the child observes the cups and chooses one of them by pointing to it. The trainer lifts up the cup and, if the reinforcer is located under the cup to which the child pointed, the child is allowed to grab it. If the reinforcer is located under the other cup, the child is just allowed to observe it before it is removed by the trainer and a new trial is started. The pretraining continues until the child turns around within a couple of seconds when asked to do so, and turns back and chooses one of the cups within 5s when the trainer says “ready.”

Training: Use the same arrangement as during pretraining, except that the trainer moves his/her face as close to the cup that contains the reinforcer as is necessary to make the child look at the trainer’s face before being allowed to choose one of the cups. Repeat this until the child observes the trainer’s face and consistently (e.g., four successive times) chooses the object with the reinforcer placed under it. Next, the trainer fades his face away from the cup on successive trials until the child observes the trainer’s face and chooses the “correct” cup even when the trainer sits laid back and just looks at the cup under which the reinforcer is placed.

General ideas for training extensions: Hide the reinforcer behind different objects in different places, use different reinforcers and different trainers.

4. Establishing mands with joint attention

Mands (protodeclaratives and declaratives) without joint attention are evident when they typically occur indiscriminate of a listener’s attention. For instance, even a well developed for, such as “Can I have that chocolate?” may occur and simply be repeated even in the absence of evidence that any listener attends.

Training: Let the child observe you putting potential reinforcers away so that they are not accessible to the child without your participation. When the child produces the first mand, do not deliver the terminal reinforcer, but prompt an attention-getting response in the child, such as calling your name, which will typically be followed by your appropriate listener behavior, such as answering “yes,” and visually orienting in the child’s direction. Then, let this constitute the occasion upon which child’s mand is typically reinforced.

5. Establishing tacts

Joint attention appears to be particularly important to verbal behavior under stimulus control, such as tacts. Skinner (1957) defined the tact as “a verbal operant in which a given response form is evoked (or at least strengthened) by a particular object or event or a property of an object or event.” According to Skinner’s technical analysis, the unique relation to a discriminative stimulus, rather than to a specific establishing operation, is obtained by (1) many different reinforcers or (2) generalized reinforcers. However, additional analyses are required in order to work out an effective intervention plan regarding how to strengthen a tact repertoire in persons who demonstrate a distinct lack in that domain. First, a normal tact repertoire is not likely to be practiced and maintained if normal listeners’ responses do not function as generalized (conditioned) reinforcers. Hence, procedures for establishing generalized conditioned
reinforcement need to be based on naturalistic observations of the specific events that are likely to constitute listener reactions to tacts in the speaker’s natural language. A large literature on ‘joint attention’ seems particularly relevant to this issue. Another person’s joint attention, in the form of visual orienting, nodding, smiling, and uttering different types of ‘relevant comments,’’ constitutes the reinforcement that characterizes the tact function. Hence, unless those responses that can be summarized as joint attention from another person actually function as reinforcers for a child’s behavior, there is no basis for a development of tacts.

Numerous attempts to establish conversational skills (such as tacts and intraverbals) in children with autism appear to have succeeded mainly within the limits of an artificial training setting in which verbal behavior has been reinforced by characteristic consequences that typically produce mands. A successful tact training program, then, must ensure that the consequences that typically follow and maintain tacts in the natural environment do, in fact, function as reinforcers. Hence, training along the lines described in previous sections (1) Social referencing: Establishing normal social stimuli as reinforcers, and (2) Establishing gaze and point following, may turn out as pivotal (e.g., Burke & Cerniglia, 1990; Koegel, Koegel, Harrower, & Carter), or prerequisites, for successful tact training. Once normal consequences do function properly as reinforcers, it is possible that exposure to naturalistic conditions may suffice to foster commenting and other conversational skills. However, we may want to speed up such a development through additional training. First, there may be a large number of “names” of objects and events that may initially be most expediently established through traditional discrete trial training (e.g., as described in Lovaas et al., 1981).

Second, in order to produce a high frequency of “learn units” (e.g., Greer & McDonough, 1999), it may be preferable to establish child-initiated training during many different naturally occurring circumstances by initially reinforcing tacting abundantly whenever it occurs.

Third, it may be wise to teach the kinds of verbal skills that are most likely to be reinforced by standard listeners. What does seem more likely to be reinforced in natural settings over time is commenting on things or events that are novel in some way. A deficiency in this area may be particularly evident in many children with autism. As one parent wrote to an internet discussion group on applied behavior analysis for children with autism, “Does anyone have any ideas on how to develop a program on teaching a child to comment? My son . . . does not make comments. A purple cow could walk by and he wouldn’t mention it.” A series of tasks that may teach the necessary skills in discriminating novel stimuli may start with simple “What’s missing?” tasks (e.g., Lovaas et al.,1981) and similar training focused on “What’s added?”, “What’s changed?” and “What’s strange?” In order to increase the rate of spontaneous commenting in natural settings, instructions may be faded by increasing the time and the distance from instructions to opportunities to respond. Novel stimulus constellations can be arranged in other rooms and gradually in more distant places so that the child is given opportunities to respond in the absence of immediate instructions.

Research questions derived from an operant analysis

According to an operant analysis, it is entirely possible that normal development of behavioral repertoires in children exposed to normal environments relies fundamentally on normal social reinforcing stimuli to function as such from very early on. If even the parents’ visual attention and smiling does not function as reinforcers for the behavior of an infant, important early forms of social skills related to joint attention may not develop. A number of important research questions follow from this interpretation:

(1) Do other’s visual attention, nodding and smiling normally function as a reinforcer from birth, or does the reinforcing effect of such stimuli develop later, possibly mainly as a result of operant conditioning procedures? This could be investigated by using a conjugate schedule (see Rovee-Collier & Gekoski, 1979) in which the degree of visual orientation towards the child, nodding, and/or smiling of a human face on a monitor is changed contingent on the rate of sucking a non-nutritive nipple.

(2) Is there a difference even at birth in the extent to which visual attention, nods, and smiles function as reinforcers for the behavior of typically developing children as compared with children with autism? The conjugate schedule procedure just mentioned could, in principle, be used to investigate whether such a
difference between children with autism and normally developing children exists even shortly after birth. Diagnosis and a possible initiation of corrective measures within the first few weeks after birth would seem like an interesting option.

(3) If the reinforcing effect of other persons’ visual attention, smiling and nodding typically depends on other, primary reinforcers, what are those primary reinforcers, and what are the relevant procedures to which children are typically exposed in their natural environments?

To the extent that other’s visual attention, nodding and smiling normally function as a reinforcer already from birth on, social interaction may function as what has been termed an autocatalytic process (e.g., Skinner, 1953) in which the reinforcing effect of such social events gain in strength because such events, in addition to being reinforcing in the first place, also constitute occasions upon which additional behavior is likely to produce more of the same. It is possible that the reinforcing effect may typically increase over time because such social events are typically correlated with a higher rate of positive reinforcement, such as other’s compliance with requests (mands). Further, it seems likely that other’s visual attention combined with nodding and smiling is typically correlated with a low frequency of aversive social stimuli. Research in this field could include initial naturalistic observation of parent—child interactions and proceed with systematic exaggeration of these features of children’s environments.

(4) Can conditioned reinforcers established through contrived contingencies be maintained as reinforcers at near-normal rates of back-up (primary) reinforcement? When other persons’ nodding and smiling do not have a reinforcing effect, such an effect can be produced by differentially reinforcing some behavior in the presence of such nodding and smiling. However, such an arrangement may work only when visible, or in the presence of “therapists” with a history of using it. Moreover, such an arrangement with obviously contrived reinforcers is potentially stigmatizing, particularly as the child advances to otherwise more normalized social environments. Hence, explicit conditioning of normal social reinforcers can only lead to a lasting normalized social skills repertoire if the conditioned reinforcing effect is maintainable at near-normal rates of primary reinforcement. How far can contrived contingencies of primary reinforcement be faded towards a non-conspicuous level without losing their effect?

Conclusion

The literature on joint attention has identified elements of social interaction that appear to be crucial for normal social functioning in general, and for verbal behavior in particular. Joint attention deficits seem to characterize children with autism, and a thorough operant analysis seems required in order to identify variables of which joint attention skills are a function. Hopefully, the current operant interpretation will spark off experimental analyses from which more advanced and effective intervention plans can be developed.

References


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Social Skills versus Skilled Social Behavior: A Problematic Distinction in Autism Spectrum Disorders

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Abstract

The primary core deficit in autism spectrum disorders is social development. While frequently acknowledged as a critical aspect of intervention for improved functioning, research on the specifics of social development and effective models of intervention is not commensurate with the acknowledged importance. We present a model of social competence that is derived from a behavioral molecular analysis approach, but which is presented in a broad ecological context. We distinguish social skills from skilled social behavior and present specific clinical examples that are derived from the model.

KEYWORDS: skills training, social competence, model development.

Introduction

From the earliest writings of Leo Kanner concerning autism, the primary focus was on social development. In 1943 he wrote "The outstanding pathognomonic fundamental disorder is the children's inability to relate themselves in the ordinary way to people and situations from the beginning of life." This emphasis on social interaction development clearly persists through current diagnostic definitions (DSM-IV TR), in which, even under the criteria for communication impairment, one sees emphasis on the social aspects of communication. This is in addition to the primary category of "Qualitative impairment in social interaction."

Even from the various perspectives of individuals with Autism Spectrum Disorders (ASD), family and caregivers, researchers, and service providers, the development of social skills for individuals with ASD is critical for positive outcome. Yet it remains under-emphasized in most educational settings, often a relative weakness in behavioral intervention programs, and poorly addressed for individuals with ASD (particularly adults) who participate in psychotherapy and 'social skills groups'. The relatively poor outcome may be a function of research efforts that have focused on a specific behavior, skill development approach. This has resulted in a molecular analysis approach, particularly within a behavioral framework, at both the service provision and research level. What has become clear is that acquisition of specific social skills, comprised of sequences of specific behaviors, does not necessarily result in skilled social behavior. It is necessary to retain the molecular approach, which is essential in assisting individuals with impoverished repertoires, but this approach must also be placed in the full range of context and components of skilled social behavior.

Given the complexity of development of skilled social behavior, we will address the specific issues from not only a behavior analytic perspective, but also encompass important research findings and perspectives about social development from other disciplines. While behavioral intervention is arguably the most effective methodology for intervention, expansion of parameters and variables beyond what is typically addressed is necessary to improve outcome. One need not adopt the underlying theory or conceptualization of other approaches in order to benefit from a differing perspective and the observations associated with it. We feel more rapid progress can often be made on complex clinical problems when perspective is gained by broad knowledge of the literature and conceptual issues, which is then used to focus our efforts within a behavioral model. Absent this approach, we risk slowing potential progress, becoming insular, and attenuating the influence we could have outside our field. While at times uncomfortable for those strongly committed to empirical research, clinicians are continually faced with the problem of needing to deliver services immediately, often without the full benefit of comprehensive research on all of the complex areas of deficit for children with ASD. Researchers...
and clinicians must help balance and support one another given the reality of our current knowledge base and the contrasting demand for services.

Social Competence: A Definition of the Construct and its Components

The construct of social competence is referenced in the literature under a number of different labels, including interpersonal skills, interpersonal competence, social skills, and communication competence (Segrin, 2000). All of these terms refer to a similar construct, which can be defined as the ability to appropriately and effectively interact with other people (Baron, 2000). Appropriate and effective social skills consist of two main components: 1) organizing cognitions and behaviors into integrated actions based on socially and culturally acceptable interpersonal goals; 2) continuously assessing and modifying social behavior in order to maximize the likelihood those goals will be attained (Reed, 1994).

As is obvious from the above definition, social competence requires proficiency across a large number of behavioral domains, including specific social skills, social perception, and social motivation. In order to be perceived as socially competent, an individual must have competence in nonverbal, verbal, and paralinguistic social skills. Nonverbal behaviors hypothesized to be of importance in social interactions include affect appropriate to the conversational content, eye contact, body orientation, smiles, gestures, head nodding, maintaining appropriate interpersonal distance, and approaching others (Sheffer, Penn & Cassisi, 2001; Stokes & Osnes, 1986; Segrin, 2000). Verbal behaviors include asking questions, speaking on topic, and responding to questions (Sheffer et al., 2001; Stokes & Osnes, 1986), whereas paralinguistic behaviors include elements of speech other than content such as fluency, clarity, volume and prosody (Sheffer et al., 2001; Jackson, Moss & Solinski, 1985; Rourke, 1982). While all of these factors have been hypothesized to play a role in the rating of an individual’s overall level of skill, the relative importance of each variable to the overall rating of an individual’s social competence has not been investigated to date.

Social perception skills are also intimately related to social competence. Social perception can be broken down into three parts: input or perception, integration or interpretation, and choice of behavioral response or output (Glass, Guli, & Semrud-Clikeman, 2000). In other words, individuals must be able to accurately perceive social situations, recognize response options particular to that situation, and then choose the option that is most appropriate (McFall, 1982). Social perspective taking or ability to empathize with others has also been identified as a component of social perception (Glass et al., 2000). Social perception is also related to the individual’s ability to detect the social context within which the interaction is taking place. As social skills are highly situation specific (Jackson et al., 1985) and social situations are highly variable (Butler & Wells, 1995), social perception plays an important role in social competence.

Social perception can be examined at two levels of analysis: the molar level or the molecular level (Leonhard & Corrigan, 2001). The authors state that at the molar level of analysis, research focuses on social roles, rules, and goals. Typically, social schema are formed based on an individual’s perception of the action, dialogue, and affect that were present in the interaction, as well as the overall goal of the interaction (Leonhard & Corrigan, 2001). A single situational schema may contain concrete cues (i.e., the actions and the dialogue), abstract cues (e.g., the affect and the goals), or both (Leonhard & Corrigan, 2001). Social schema then function as templates for the individual against which new incoming information is compared and processed (Leonhard & Corrigan, 2001). Prior knowledge of culturally conventional rules that govern behavior in social situations is also a necessary in order to respond appropriately (Penn, Combs, & Mohamed, 2001). At the molecular level, skills are theoretically broken down into their smallest component parts. At this level, social perception can be theorized to be composed of such elements as facial affect perception, facial recognition, person perception, person memory, and perception of nonverbal stimuli (Newman, 2001; Penn et al., 2001).

An individual’s reaction in a social situation also depends on interpretation of the intent of the other participant in the interaction (Dodge, 1980). If the intent of the communication partner is misinterpreted, the
individual’s reaction will likely appear socially inappropriate (Dodge, Murphy, & Buchsbaum, 1984). The detection of the intention of a communication partner is likely related to aspects molecular social perception skills listed above. Thus, if an individual is deficient in these skills he will also have difficulty with intention detection.

Investigations of the importance of social motivation and its relationship to overall social competence is not an area that is well represented within the empirical literature. Despite this fact, Segrin (2000) stresses the importance of considering social motivation separately from an individual’s social performance. He states that under conditions of low social motivation individuals may display a lower level of skill than they possess. For example, if an individual in a social situation is apathetic about the outcome, he is not likely to expend effort to appear skilled in that situation. Thus, his communication partner would judge him as socially incompetent. However, the judgment of incompetence is based on his lack of motivation to appear skilled in that given situation, not necessarily due to the fact that he actually lacks the skills.

Existing Models of Social Competence

McFall’s (1982) model of the interaction of the components of social competence can be conceptualized as a two-tiered model. He hypothesizes that an individual’s prior history and the specific situation affect the individual’s processing of the situation. He breaks down processing into three components: decoding skills (reception, perception, and interpretation), decision skills (response search, response test, response selection, repertoire search, and utility evaluation), and encoding skills (execution and self-monitoring). All of the above factors interact to produce the individual’s response, which can then be judged as competent or incompetent. McFall’s model, while complete in the conceptualization of a one-stage social interaction, does not adequately consider perception of the social consequences of an action. Additionally, while it may be possible to argue that social motivation is to some extent included in an individual’s prior history, this component is not explicitly included within McFall’s model.

Dodge has proposed two separate but similar models of social competence (Dodge, 1985; Dodge & Murphy, 1984). The model outlined by Dodge and Murphy (1984) states that an individual’s memory or past experience in similar situations, and the individual’s goal for the interaction affect all aspects of social performance. An individual when exposed to a social stimulus will decode and interpret the stimulus, choose which response to exhibit, and finally enact the response. The individual will then monitor the situation and regulate his behavior according to the response of the communication partner. The model in his 1985 paper is similar to the one proposed in 1984. In the 1985 model he hypothesizes “unconscious” influences (including goals and social schemas) and the specific task as global influences to social performance. While the reference to unconscious processes is not a useful analysis, the description of factors affecting processing of social information, which includes encoding, interpreting, searching for a response, evaluating the response, enacting the response and self-monitoring, is a useful beginning. Like McFall’s model, Dodge fails to explicitly include motivational aspects of social interactions in his model.

Argyle and Kendon (1967) attempted to create a hierarchal model of social skills. They hypothesized that the first distinction in the hierarchy is between “translation processes”, i.e., those process that determine how an individual will interpret a particular stimuli, and “effector processes”, i.e., the actions that the person takes in a given social situation. “Effector processes” are further broken down into “standing features” and “dynamic features”. “Standing features” are those that tend to change very little throughout an encounter, such as interpersonal distance, and orientation. Conversely, “dynamic features” are those that are constantly changing throughout the course of an interaction, such as the patterning of silences, language and speech, visual orientation, and facial expression. While the authors outline many of the key components of social interactions, including social motivation, they fail to describe how they hypothesize these elements interact.
While the above mentioned models have a more general focus, Patterson (2002) proposed a model of the development of antisocial behavior in young children. He hypothesized that antisocial behavior, as is true for most behaviors, is maintained by reinforcement (positive or negative) that is provided contingent on these behaviors. Patterson’s model also states that the development of antisocial behavior is affected by the context of the family life. Factors that are hypothesized to affect antisocial behavior are parental divorce, social disadvantage, and parental depression. These factors have been found to be mediated by parenting practices (Patterson, 2002). As children age, antisocial behaviors tend to change in topography. According to Patterson’s model this change is mediated by the influence of a deviant peer group who encourage or teach additional antisocial behaviors. Patterson’s model is relatively simple and straightforward. However, at present this model does not address other factors that may influence the outcome of complex social interactions (e.g., competition between reinforcing contingencies within a social situation).

All of the above mentioned models have potential shortcomings. McFall (1982) criticizes molecular models of social interaction as being too microanalytic. He states that these models are an attempt to parse a continuous stream of behavior into artificial units. As such, both his model and Dodge’s models choose to focus on more molar aspects of social competence. However, these models may be of limited use for clinicians seeking to identify and ameliorate specific deficits in social functioning. For example, if an individual is found to have deficits at the response level of McFall’s model, a clinician has limited information regarding what specifically is problematic about the response as the term is overly broad, and therefore provides limited information about how to best intervene. Additionally, both McFall and Dodge’s models do not explicitly denote the interaction of motivational variables with the other molar components outlined in their models. While Argyle and Kendon outline many molecular units of social competence, the shortcoming of their model is that they fail to outline the specific interactions between these components. Patterson’s model gives a concise, but limited, theory on the development of antisocial behavior. Given the variability in the response pattern of children participating in studies examining the effect of manipulating contingencies for antisocial behavior, it has been acknowledged that other organismic and environmental variables may not be accounted for by the current model (Snyder et al., 2003). In other words, additional factors may need to be included in the model to give a comprehensive account for the development of antisocial behaviors.

Proposed Model of Social Competence

An expanded model (White, 2005) which addresses the short-comings of above models conceptualizes social competence as consisting of a non-linear interacting triad of appropriate response repertoire, detection/discrimination of socially relevant stimuli, and motivation/reinforcement for social interaction (See Figure 1 at end of paper). This model contains a combination of sequential effects and non-sequential effects of the different hypothesized elements of social competence. Sequential effects are those processes that by virtue of their occurrence in time affect each other in a sequential manner to form a response chain. For example, it would be impossible for an individual to attend to a stimulus before it is present, thus the stimulus must occur before an individual can attend to it. Sequential effects can only have an impact at one particular level of the response chain. Non-sequential effects are those that do not have to occur in a particular order in time, and though they affect the response chain, are not directly a part of it. For example, social schema/expectations, though activated in a sequential manner by context (i.e., you do not have a set of expectations regarding events until you are exposed to a particular context) have non-sequential effects at multiple levels of the response chain (e.g., attention to stimulus, interpretation of stimulus, and interpretation of consequences).

Interactions occur in a context and have multiple sequential and non-sequential effects. Context encompasses cues associated with the individual’s history of reinforcement in similar contexts, as well as prompts recall of rules and conventions related to appropriate behavior. Finally, it causes the individual to have particular expectations (social schema) about the nature and outcome of an upcoming interaction based upon their reinforcement history. A specific stimulus then will occur within this context and is responded to based upon the history of reinforcement related to that stimulus. The individual’s attention to the stimulus in turn
affects the detection/discrimination of the stimulus. Once the stimulus has been detected/discriminated, the individual then interprets it, and selects which response to emit, if any. The individual can choose to respond in a manner that indicates a desire to approach or escape/avoid the social interaction, or he can choose to not respond at all. The verbal, nonverbal, and paralinguistic aspects of the individual’s response are then detected/discriminated by the communication partner. If the communication partner detects/discriminates them, they can be responded to as being an escape/avoidance-based response, an approach-based response, or a non-response. The communication partner then selects a response, again either no response, an escape/avoidance response, or an approach response. The verbal, nonverbal and paralinguistic aspects of the communication partner’s response are then detected/discriminated by the individual. The individual’s detection/discrimination of the consequences not only affects his reinforcement history, motivation and social schema of the event, but also becomes the stimulus for the next response.

Rules and conventions of the situation have effects at the level of the individual’s response selection, as do social schema/expectations. Expectations also affect the individual’s attention to, detection/discrimination of, and interpretation of the stimulus, as well as the response selection. Social schema/expectations can also affect the individual’s detection/discrimination of the consequences of his response. For example, if a socially phobic individual expects that he will be evaluated in a negative manner in social situations, he may interpret ambiguous consequences as negative, therefore confirming his negative expectation.

Reinforcement history with the specific context and stimulus, the individual’s goal in the interaction, and the potency or strength of the anticipated reinforcer, all have a cumulative effect on an individual’s motivation. Motivation then in turn affects the individual’s detection/discrimination of the stimulus and response selection. Motivational processes alone can have a significant impact on social competence. For example, an individual lacking in motivation may appear to lack social competence, but if given specific prompting and reinforcement, has the ability to behave appropriately. However, individuals lacking in skills and social judgment may be motivated to engage in social interactions, but perform poorly when they do so. Social skills and social judgment are foundational skills and are therefore necessary, but not sufficient components for social competence. The catalyst of social motivation is required for an individual in the unaltered natural environment to appear competent.

Accurately detecting/discriminating the stimulus allows the individual to identify which response is appropriate for the situation (Corrigan & Penn, 2001). However, there is an interaction between an individual’s detection/discrimination of the situation and motivation to perform in that situation. If an individual is highly motivated to perform well, he or she will likely expend more effort in the detection/discrimination process (Klimoski & Donahue, 2000). His or her motivation will in turn be affected both by prior experience in similar situations, as well as the importance of attainment of the goal of the interaction. Additionally, an individual’s detection/discrimination of the situation will be affected by “social schema” of similar situations (Newman, 2001). An individual’s response choice will be affected by several factors including social motivation, social history and knowledge of social rules and conventions. After the individual has chosen and performed a response, future performance for that type of interaction will be altered depending on the feedback and reinforcement that is received from the communication partner.

It should also be noted that many of the factors within this model may be further broken down into component skills. Thus, though the model is more molecular than those proposed by McFall (1982) and Dodge (1985), it is not as molecular as the one proposed by Argyle and Kendon (1967). Social competence requires in part all of the aspects outlined previously, such as affect detection/discrimination, face recognition and detection/discrimination of non-verbal cues. Social response consists of non-verbal, verbal and paralinguistic responses. The items outlined in Figure 1 represent the necessary gross components, many of which may contain subparts.
As illustrated by the figure, an individual must possess a great amount of knowledge and skills in numerous areas in order to be socially competent, and the entire system could be disrupted by a deficit in any number of areas. While there has been some preliminary work examining the molecular components of individuals’ behavior in specific social contexts (e.g., Conger & Conger, 1982; Conger & Farrell, 1982; Trower, 1980), the majority of the constructs outlined in this model have not been investigated. As such, the effect of a single deficit or combination of deficits cannot be predicted as this time.

Implications of the Proposed Model for Conceptualization of Specific Disorders

Just as appearing skilled in a social interaction requires a large amount of knowledge and performance across a number of different domains, individuals may appear unskilled if they lack or are deficient in one or several areas. For example, children with Attention Deficit Hyperactivity Disorder often appear to lack skill in social situations. Attentional deficits could interfere with performance at many levels of the model, including attention to the stimulus or detection/discrimination of response from the communication partner. Inaccurate attention to the original stimulus may result in a response that appears inappropriate to the stimulus and/or context. Additionally, if an individual has difficulty at the level of detection/discrimination of response from the communication partner, over time this deficit may also affect reinforcement history, motivation, goal of interaction, social schema/expectancies, rules/conventions, and/or reinforcer potency. Thus, even deficits which begin a one or two levels of the model, may affect other aspects of a social interaction if these deficits are present across an extended period of time.

Deficits in the area of social skills are a defining characteristic of individuals with pervasive developmental disorders (American Psychiatric Association [APA], 2000). In the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) the diagnostic categories of Autistic Disorder, Asperger’s Disorder, and Pervasive Developmental Disorder – not otherwise specified (PDD-NOS), all require that a child have persistent and pervasive deficits in social interaction (APA, 2000). Specifically, individuals with pervasive developmental disorders (PDD) have been found to have deficits in expressive gestures, maintaining eye contact, joint attention, and social responsiveness (Lord, 1990). Children with PDD have also been found to have longer latency to initiate social behavior (Lord, 1990), have difficulty in understanding the rules governing social interaction (Wing, 1981), and be less responsive to the distress of others (Travis, Sigman, & Ruskin, 1999). Individuals with PDD also appear to have difficulty with social detection/discrimination tasks, particularly those related to affective content (Hobson & Lee, 1989). Thus, it appears that individuals with PDD have deficits at several levels of the model, including detection/discrimination of social stimuli, production of verbal and non-verbal behaviors, utilization of social history, and generation of rules/conventions. Additionally, they likely have deficits in social motivation. As such, individuals with ASD appear to have pervasive deficits across a number of areas of social competence (note: we will use the term ASD as descriptive rather than continue to use the specific diagnostic category of PDD).

Implications of the Proposed Model for Treatment Programs

Though a large amount of experimental work remains to validate aspects of the proposed model, it can minimally provide a framework for conceptualizing social skills intervention programs. As is evident from Figure 1, comprehensive social skills programming requires intervention across a variety of domains. Treatment outcome studies of social skills interventions or assertiveness training have often demonstrated failure of the generalization of these skills to novel situations (e.g., Bustillo, Lauriello, Horan, & Keith, 2001; Marder et al., 2001; Wallace et al., 1980). One potential reason is that most programs are restricted in their focus, e.g., teaching individuals verbal social skills while ignoring social judgment and nonverbal social skills. If an individual possesses skills, but is unable to detect the necessary stimuli that signal the appropriate use of those skills, he or she may not be socially skilled. Recent intervention programs with a broader focus, including
teaching social judgment have shown promising preliminary results in terms of efficacy and generalizability (Vallina-Fernandez et al., 2001; Wallace, Liberman, MacKain, Blackwell, & Eckman, 1992).

**Application to ASD**

Houck (1999) suggested that for otherwise ‘typical’ toddlers who have deficits in social competence continue to experience difficulties in social situations if intervention is not received. This serves as a useful anchor point of how important specific intervention is for individuals with ASD. For the ‘typical’ toddler age group, social competence includes prosocial behaviors, such as, initiating play, joining in, following rules, turn-taking, sharing toys, understandings others’ feelings and having empathy. Within this type of context, social competence can be defined as a behavioral outcome related to a social situation wherein an individual exercises a choice in a social situation that is successful.

To have social competence, one must be autonomous in the initiation of social interactions, the decision-making process of making choices, the behavioral output, and also have appropriate self-regulation appropriate to the social situation. Given that social behavior permeates all facets of an individual’s life, it is critical that individuals with ASD develop some level of social competence so that they can successfully participate in educational, social, family, community, and work activities. Most often, the social deficits in ASD prevent inclusion and result in exclusion. Therefore, social skills instruction should be incorporated into every aspect of a child’s curriculum, yet is often observed to be a relatively small component in educational settings. Because teaching of social competence to individuals with ASD is extremely challenging and complex, it is perhaps not surprising that more is not typically done in school settings.

There is no “one way” to teach social skills that will produce meaningful social behavior that generalizes across contexts, scenarios, individuals, etc. We know that, as a group, individuals with ASD have difficulty generalizing skills across settings and unfortunately, social interactions and contexts are rarely the same. In order to teach functional skills, children need to learn how to respond appropriately despite variations in contexts, interactive styles, verbal content, etc. Creating multiple opportunities for practice is essential.

Our model emphasizes the importance of addressing social competence from a broad perspective and incorporates the many variables that influence the development of social competence, while being rigorously focused upon behavioral intervention and measurement.

**Importance of Motivation**

Social interactions tend not to be intrinsically reinforcing for children with ASD. Therefore, many opportunities need to be provided so that children can experience the rewards of successful social behavior (albeit no doubt of lesser magnitude than for typical children), and thus form a strong reinforcement history.

According to our social competence model, motivation is influenced by an individual’s reinforcement history, the goal of an interaction, and a consequence’s potential potency as a reinforcer. Motivation is also influenced by an individual’s detection/discrimination of the consequences of past social interactions that can include a wide variety of variables, including context, the social stimulus (stimuli) itself, the presence of a response repertoire to produce a social behavior, the interpretation of the response from a communication partner, etc.

An individual’s level of motivation will in turn influence attention to a stimulus in the environment, which affects the individual’s response selection. Additionally, an individual’s interpretation of a stimulus and response selection are also influenced by level of motivation. Therefore, without sufficient motivation, one can hypothesize that an individual may not have an opportunity to learn about, respond to, or interact with a social stimulus/event.
For children with ASD, level of motivation to engage in social interactions is typically low or absent compared to similar age peers. The literature base of “reinforcer preference” (sic) for children with ASD clearly indicates that preference for non-social stimuli can be easily assessed. (Note: the term reinforcer preference in this literature is more correctly phrased as assessing stimulus/stimuli for preference to then be used as a potential reinforcer. However, in keeping with the general use in the literature, we will use the common term “reinforcer preference”).

Most researchers and practitioners agree that assessment of an individual’s social skills, including level of social competence and motivation must take place in order to develop effective teaching strategies for an individual. A second, complementary process, is to consider the gap in the individual’s chronological versus developmental age. Consideration of chronological age allows for the selection of age-appropriate skills, settings, and activities, which are generally accepted as an important anchor point to judge the appropriateness of goals and settings. Determining an individual’s developmental age provides information about the level of social skills an individual may or may not have in the skill repertoire, relative to other areas of developmental delay. Consideration of both aspects of development are important in designing social skills interventions that will be effective, will generalize, and will have a positive impact on the individual’s social competence. Assessment of skill level typically takes the form of a checklist, parent and/or child interview, behavior observation, ecological assessment, and/or baseline measures.

**Intervention**

As a guiding set of questions for our typical clinical social skills interventions (Gillis, Matey & Lockshin, 2004), we assess important areas that relate to an individual’s reinforcement and motivation to respond in a social context, an individual’s ability to identify a social situation or context (verbally or nonverbally), an individual’s specific behavioral responses in social contexts, and an individual’s perception of the social (or communication) partner’s behavior in a social context.

Based upon these four primary elements of assessment and based on our model, we begin to pinpoint the components of a social skills intervention within the following areas:

**I. Motivation and reinforcement**
1) Is the individual aware of reinforcers (that is, preferred stimuli and events that the natural environment makes contingent on social behavior) in the environment?
2) If so, what types of reinforcers are preferred by the individual? This typically necessitates a reinforcer preference assessment.
   a) Primary (e.g., preferred food and drink)
   b) Symbolic (e.g., points, money, checkmarks, stickers)
   c) Tangible (e.g., toys, play breaks, stickers, cards, etc)
   d) Social (e.g., praise, smiles, etc)
   e) Physical stimulation (e.g., hugs, tickles, high fives, etc)
3) Given the information gathered by a reinforcer preference assessment, what types of reinforcers are available to the individual in social settings? (The purpose of this question is to determine the potential reinforcers in the teaching and natural environments.)
4) Can the individual correctly respond to social contexts where reinforcers are available?

**II. Social awareness**
5) Can the individual correctly respond to specific behavioral expectations for different social contexts?
6) Does the individual respond to basic social rules/conventions?
   For example:
   a) When do you approach an individual?
b) What type of behavior do you respond to socially?

c) What are the stimuli in the environment that may provide cues for identifying the social stimulus?

7) Does the individual attend to a social stimulus in the context/setting?

a) Does it appear that the individual requires more tangible motivation to attend to the social stimulus?

b) Does it appear that the individual requires a prompt to attend to the social stimulus?

8) Is the individual able to respond to different facial expressions?

III. Social behavior

9) Does the individual attend to the social stimulus, but not approach the stimulus?

10) Does the individual escape/avoid the social stimulus?

11) Does the individual ever approach the social stimulus and respond?

12) If so, is the individual’s response appropriate or inappropriate?

13) And, what type of response does the individual provide?

   a) Paralinguistic
   b) Verbal
   c) Nonverbal

IV. Social perception

14) What is the response of the communication partner to the individual?

15) If an individual is approached or escaped/avoided by a communication partner, how does he respond to the response/lack of response of the communication partner?

16) Is the response of the communication partner acted upon:

   a) As no response
   b) As escape or avoidance
   c) As approach
   d) The individual does not discriminate responses from the communication partner

17) Does the individual detect/discriminate the consequences of the social interaction as:

   a) Positive
   b) Negative
   c) The individual does not detect the consequence of a social interaction.

Utilization of our model of social competence allows us to create not only task analyses of important social skills, but also to be highly sensitive to situational contexts and the multiple domains of behavior of the social partner that must become discriminative stimuli for the child with ASD.

The top of the social competence model begins with context. The context in which we interact with others influence our social behavior in many ways. For example, one’s social behavior may differ in a familiar setting (such as in one’s own home with family members) as compared to a novel setting (such as meeting new classmates at the beginning of a school year). One of the striking deficits in children with ASD is their difficulty in generalizing skills learned to different contexts. Additionally, individuals with ASD have difficulty learning how to slight change a social behavior given the context, such as greeting friends compared to greeting a police officer. The underlying social skill is greeting, however, due to the number of different possible contexts, the skill of greeting multiplies in complexity. Teaching a social skill in its natural context is helpful to assist with generalization of such skill. Given that a social skill may vary depending on the context, individuals with ASD sometimes need to be taught in multiple contexts these skills. However, sometimes teaching a skill in its natural context may be contraindicated because the individual requires acquisition of other pre-requisite skills. In these instances, a one-to-one teaching setting may be recommended in order to teach pre-requisite skills, refine a social skill, or learn a different skill that is causing difficulty with learning the social skill. Even though a one-to-one teaching setting may be very effective in learning specific skills, these skills are in a very specific context; the individual with ASD may be able to perform the social skill, but only with the adult teacher
or adults in general, which may make generalization to peers and others difficult. Additionally, the individual may have limited access to peer modeling of the social skill in a one-to-one setting.

In order to maximize our resources, and acknowledge that a child’s intervention program has many components in addition to teaching social competence, we use the following table to assist us in establishing priorities. We fill in the cells with a ranking of high, medium, or low priority, while taking into account the child’s typical acquisition pattern. We divide our “social skills groups” based on functional level of social competence (early, basic, intermediate, and advanced).

<table>
<thead>
<tr>
<th>Areas of Social Competence Model Addressed</th>
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</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Early</td>
</tr>
<tr>
<td>Basic</td>
</tr>
<tr>
<td>Intermediate</td>
</tr>
<tr>
<td>Advanced</td>
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</tbody>
</table>

Based on these priorities, we cluster children into functional sub-groups within the four primary groups (Gillis, Matey, & Lockshin, 2004).

Factors and characteristics of each group

**Early Social Skills Group**
- No more than 3 children for the majority of the group activities; larger group activities for short periods of time.
- Typically, very limited language and communication skills
- Typically, aggression that has the potential to put other children at risk in a typical play or social setting
- Typically, limited isolate play skills

**Basic Social Skills Group**
- Typically, most children have the ability to communicate basic wants/needs either verbally or nonverbally with minimal prompting.
- Typically, children have the ability to follow simple directions given via verbal gestural/sign language with 50% accuracy.
- Typically, low frequency and intensity of aggressive behavior
- Typically, children have the ability to tolerate physical prompting without becoming upset between 50-60% of the time.
- Most children in the group respond to contingencies for aggressive or disruptive behaviors.
- Some ability to transition from one activity to another without difficulty
- Typically children require immediate reinforcement and/or high density of reinforcement for appropriate social interactions.
- Typically, children have the ability to remain in seat/work area for approximately 60% of the time.

**Intermediate**
- Typically, fairly well-developed verbal repertoire even though language (verbal/nonverbal) may not be used socially.
- Ability to follow simple directions given via verbal gestural/sign language
- Occasional aggressive behavior under when duress.
• With minor exceptions, most children respond appropriately with verbal prompts only and re-
specification of contingencies.
• Typically, able to demonstrate understanding of contingencies.
• Typically children demonstrate the ability to delay gratification and/or manage behavior with the aid of
symbolic reinforcers.
• Generally able to transition from one activity to another without major upset.
• Ability to remain in seat or in work area for majority of scheduled session.

Advanced Group
• Typically, fairly well-developed verbal repertoire.
• Ability to follow simple and complex directions.
• Typically, infrequent aggressive behavior(s).
• Typically, children respond appropriately to verbal prompts to change inappropriate behavior, with
minimal use of contingencies.
• Typically, able to demonstrate understanding of contingencies.
• Typically children demonstrate the ability to delay gratification and/or manage behavior with the aid of
symbolic reinforcers.
• Generally able to transition from one activity to another without major upset.
• Ability to remain in seat or in work area for majority of scheduled session.
• Typically able to follow rules provided for different social situations.

Some examples of intervention strategies

In addition to specific social skills groups, a few of which were described above, we also address the
development of social competence throughout the school day in classroom activities and instructional time. For
example, most classrooms conduct “Circle Time” where a number of activities such as reading, singing,
discussing the weather and days of the week, etc are provided to enhance social interactions. Another example
is the emphasis of social skills taught within the physical education classes. Even though gross and fine motor
skills as well as learning different athletic skills are goals, the social skills that are associated with these types of
activities are emphasized as complementary goals. For instance, when learning toss and catch skills, these
might be taught within the context of playing “Hot Potato”, which is a social game that requires social skills
such as eye contact, affect display, good sportsmanship, etc.

As part of our program, in addition to the above specific socials skills groups, we have created
a component we call the “Buddy Group” (Romanczyk, Lockshin, Matey, & Gillis, 2005). Because it has been
our experience that children with social skill deficits may possess the range of vocabulary and specific play
skills that are required for social integration, yet still have problems because they use these skills in a rigid, rote,
or atypical manner that results in poor acceptance by typically developing peers, we developed a specialized
setting to address this problem.

The Buddy Group is an after school setting that pairs similar aged middle and high school students with
children with social skill deficits. The primary emphasis of the program is to work with these children to
expand their social skills, and encourage them to use these skills in a manner that advances friendship
formation.

The Buddy Group is conducted as an after school program to give us more flexibility outside the
normal school-day constraints. A guiding principle of the program is to provide multiple exemplars and
multiple settings with repetitive practice examples to enhance social skills using systematic behavioral
procedures. Explicitly, the middle and high school students are not utilized as ‘junior therapists’, but rather
maintain typical peer roles. The types of activities chosen are ones that are preferred by similar aged peers in
order to maximize generalization and these activities are used to facilitate the social skills being addressed.
Activities include playing board games, creative play (e.g., art-related activities), gross motor group games (e.g., bowling, tennis, dance, etc), putting on plays, hosting parties, and attending various community events.

Another group we have developed is one that focuses on social skills development for young children with Asperger’s Disorder. Even though there are similarities within autism spectrum disorders with respect to social development, children with Asperger’s disorder present additional complex characteristics. This group is a focused, ten-session after school program. Within each group meeting, a designated subset of basic skills are reviewed, rehearsed, and role-played within the instructional portion of the session. Each session also contains a segment that provides the children with the opportunity to practice the skills learned within the context of age-appropriate social activities (i.e., games, projects, sports). To assist with generalization of skills, parent participation is also an important component to this group. Parents help their children complete homework assignments and learn how to coach appropriate social interactions. In order to provide motivation for the children to attend and participate in the instruction and group activities and to manage disruptive behaviors a point system is utilized throughout the ten sessions. Emphasis is placed upon providing learning opportunities in various contexts and with multiple social partners to reduce rigidity of responding.

Consideration of family needs and goals in the area of social development is also a significant part of our educational program. A strategy used is to provide parents and siblings with specific intervention programs to enhance social competence in the home and community environment. For example, often there is “competition” among family members for attention and interaction with each other, and particularly for siblings, with parents. To assist a family in addressing this, it is necessary to involve each family member and recognize that specific skills may need to be taught to individuals in addition to the child with ASD. These are complex social skills and thus, we typically address first address in the school setting the specific skills needed by the child with ASD. Then begins generalization to the home setting with the teaching of specific skills to family members.

Additionally, care is taken to teach social skills that may not be typically taught within the school setting or practiced in the home setting, but are nevertheless valued social skills for the family. For example, attending a movie can be challenging for families with children with ASD, as the child with ASD is required to sit in the dark, among strangers, for a long duration, attend, and may be expected to react to or be able to comment about the movie, including sharing his/her favorite part of the movie. Within our school setting, we have created an analog “movie theatre” with the same general proportions as a typical “movieplex” theatre. It emulates the lighting conditions, sound level, image size, and seating arrangements found in a movie theatre (because we have control over these variables, we are also able to address specific anxiety responses for children who react negatively to this setting via behavioral desensitization procedures). Children learn how to purchase movie tickets and concessions, the social rules and behavioral demands required in the movie setting, specific vocabulary related to watching movies appropriate to their age-group, and how to comment and share information about the movie. When necessary, token economies or behavioral contingency plans are implemented to assist children with maintaining appropriate behavior.

The Challenge

Interventions, such as the above few examples, can be a crucial component in improving the quality of life for the family and child with ASD (Lockshin, Gillis, & Romanczyk, 2005). Building social competence, arguably the most difficult area of intervention for ASD, requires not only a comprehensive assessment of social deficits but also a comprehensive approach to intervention. Ideally, well-designed intervention programs would also include behavioral cusps (Bosch & Hixson, 2004). Behavioral cusps are behaviors that: result in access to new reinforcers, contingencies, and environments; are socially valid; allow for the generation of a wide number of behaviors; compete with inappropriate responses; and/or affect a large number of people (Bosch & Hixson, 2004). Interventions that include behavioral cusps are thought to be more efficient and effective as they presumably allow for acquisition of skills without direct teaching. It is essential that one adopt
a strong behavioral, molecular framework of skill building, but simultaneously also adopt a framework of ecological complexity.

Utilization and refinement of comprehensive social competence models, through application and research, will assist in making substantial progress in our ability to provide effective services. However, with respect to applied/clinical intervention for children with ASD, especially for such complex and broad areas of development such as social development, research will always lag practice. This is inevitable as the number of variables contained in any given comprehensive intervention (behavioral or non-behavioral), are such that specific research on each component, with respect to efficacy, sequence effect, and synergy and attenuation of various permutations of combinations of components. Such research must then be evaluated in both an efficiency context as well as a risk benefit analysis. Clearly the full scope and complexity of such parametric research presents ethical and pragmatic constraints with respect to cost benefit that will preclude such comprehensive research on individual models and treatment packages. This does not mean however that “All have won and all must have prizes”. Every model presented must be scrutinized with respect to it’s research underpinnings, rationale, and support for the components and perhaps most importantly, evidence of effectiveness. The effective ‘marketing’ of a model is not synonymous with effectiveness of the model.

There are a number of pressing significant issues that both researchers and clinicians can to address that are both important and cost beneficial, such as direct comparisons of intervention ‘packages’, developing more comprehensive and sensitive assessment tools, paying greater attention to reactions of the social partner, acknowledgement that social competence is not a static set of skills, and that generalization is not simply an extension of a specific behavior or skill across settings. Generalization to achieve social competence requires complex selections of behaviors from a substantial repertoire. Given that poor social competence is a core deficit in children with ASD, continued research in the area of social competence is critical to improving the quality of life for children with ASD.

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Figure 1, Next Page
Figure 1. Schematic representation of the proposed model of social competence
Reducing Media Viewing: Implications for Behaviorists

Leonard A. Jason, Jennifer Danielewicz and Anna Mesina

Abstract

American children spend an average of 6 hours and 32 minutes each day using various forms of media. Research has suggested that this high level of exposure has a negative impact on children’s attitudes and behaviors. For example, media violence increases aggression in children, especially video games which allows children to be the aggressor and obtain rewards for violent acts against others. In addition, media influences sexual behaviors and attitudes by sending contradictory messages that glamorize sexual activity and disregard the risks of such behaviors. Along with these negative behavioral influences, media also impacts children’s health and is linked to the rise of childhood obesity. From 1980 to 2000, rates of children being overweight have doubled, while obesity continually is associated with higher rates of hypertension, asthma, type II diabetes, and cardiovascular disease. The majority of research has found a link between the amount of time children spend watching TV and their body weight. Given that 81% of children age 2-7 use media unsupervised (Kaiser Family Foundation, 1999), parents need to play a more active role in monitoring their children’s use of electronic entertainment activities and structuring socialization activities. In this article, we will review behavioral technologies to assist parents in reducing their children’s media use.

Keywords: television, media violence, intervention strategies.

In a comprehensive examination of the literature over two decades, Comstock and Scharrer (1999) conclude that children who watch excessive television perform poorly on standardized achievement tests. Furthermore, it was discovered that excessive media usage negatively affects school performance because viewing replaces time that might otherwise be spent reading or engaged in alternate school-related activities. Practice time is lost, and as a result, children (particularly those with learning disabilities who are in need of the practice) lose fluency and automaticity in skills (Corteen & Williams, 1986). Researchers have also found that children's writing is often similar in style to television show scripts, which are often fragmented and disconnected without regard to logic. Henke (1999) found that 39% of children stated they would prefer to surf the Internet than to engage in their favorite after-school activity. Time spent in educational activities and social interactions are negatively related to time watching educational television (Huston, Wright, Marquis, & Green, 1999). Heavy viewers also are more likely to hold common cultural stereotypes, many of which are emphasized on television. In addition, those who watch excessive amounts of television and utilize other electronic media have little time for other critical life experiences, such as learning to play cooperatively with others.

Meanwhile, network television has tended to feature high levels of violence and other inappropriate programming. A five-year study by the American Psychological Association estimates that the average child has watched 100,000 acts of violence and 8,000 acts of murder by the time he or she leaves elementary school. Furthermore, by the conclusion of high school, the average child has been exposed to 200,000 acts of violence (Huston et al., 1992). Singer, Miller, Guo, Flanner, Frierson and Slovak (1999) found that 45% of the variance in students’ violent behavior can be accounted for by demographics, parental monitoring, television-viewing habits, and exposure to violence. In a published longitudinal study, Johnson, Cohen, Smailes, Kasen, and Brook (2002) found a significant association between the amount of time spent watching television during adolescence and early childhood with the likelihood of aggressive acts against others, even when controlling for childhood neglect, family income, neighborhood violence, parental education, and psychiatric disorders. Huesmann, Moise-Titus, Podolski, and Eron (2003) also found that childhood exposure to violence predicts young adult aggressive behavior for both males and females. Children who achieve less tend to watch television more often, identify more strongly with aggressive television characters, and are more apt to believe that aggressive television content is real.
Whereas viewing television is a fairly passive experience, playing video games and Internet surfing are highly interactive. These new electronic media sources can often promote violence and hate (Sher, 2000). A large proportion of this media exposure includes acts of violence that are witnessed in the form of video games (Roberts, 2000). Video games set a child in the role of the aggressor and thus reward him or her for violent behavior. Griffiths and Hunt (1998) maintain that video games allow the player to rehearse an entire behavioral script and as a result, video games may very well produce dependency in children and adolescents. This holds true when children yearn to engage in games for long periods of time in order to advance to higher levels. Additionally, studies show that children in grades four through eight prefer video games that award points for violence against others (Funk & Buchman, 1996). Interactive media are relatively new, and consequently there has been little time to assess their influence. Nevertheless, several studies indicate that the effects from interactive media may be even more profound than those of passive media, such as television (Anderson & Dill, 2000; Irwin & Gross, 1995). For example, after playing violent video games, children exhibit measurable decreases in prosocial behaviors and increases in violent retaliation to provocation. In fact, playing violent video games has been found to account for a 13% to 22% increase in adolescents’ violent behavior (The Impact of Interactive Violence on Children, 2000).

Media also plays a role in children’s sexual behavior and attitudes. Greater exposure to television’s sexual content has been associated with stronger endorsement of recreational attitudes toward sex (Ward & Rivadeneyra, 1999), and these types of findings have increased parental concerns about TV viewing among children. With a few notable exceptions, television, computer games, and the Internet largely fail to address the issues of teen pregnancy and the incidence of sexually transmitted diseases, including AIDS, among teenagers. On the contrary, at a time when young people are being urged to restrain from sex for their own personal safety, television, computer games, and the Internet continue to emphasize the glamour of sex.

It is important to recognize that television, video games, and computer activities are not all bad. The Internet is frequently used for school-related tasks (LaFerle, Edwards, & Lee, 2000), and quality programs, games, software, and web sites can serve as an entertaining, informative part of a child’s day. Educational television programs have little violence, and exposure to these shows (e.g., Sesame Street, Mr. Roger’s Neighborhood) during early childhood is associated with later academic success and imaginative behavior during adolescence (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). Many educational programs on commercial stations have little violence (Jordan, Schmitt & Woodard, 2001). In addition, some children are able to divide their attention between viewing these electronic media and doing other activities without losing control. Modern theories of cognition support the notion that children are active viewers of television or other media. In other words, the seemingly simple act of watching television is not a completely passive experience. Calvert (1999) suggests that media can challenge stereotypes, educate, and foster nonviolent forms of dispute resolution. It is important for parents to become involved in steering their children toward viewing television series that promote positive outcomes (Sanders, Montgomery, & Brechman-Toussaint, 2000). These media programs should represent just one part of a child’s day that is appropriately balanced with a mix of social, physical, and imaginative pursuits (Jason, Hanaway, & Brackshaw, 1999).

Media, Inactivity, and Obesity

Faith et al. (2001) maintain that elevated television viewing and resultant physical inactivity promote obesity in children. This is due to the fact that children are more likely to snack excessively and eat less healthy meals while viewing media (Van den Bulck, 2000), and children who watch more television are less likely to participate in rigorous physical activity (Anderson, Crespo, Bartlett, Cheskin, & Pratt, 1998). American children spend an average of 6 hours and 32 minutes each day using various forms of media (television, movies, video games, computer, and the Internet) (The Henry J. Kaiser Family Foundation,
Children spend four times the amount watching TV as doing homework, and by age 18, the average American child has spent more time watching TV than engaging in any other activity except sleep (Roberts, Foehr, Rideout, & Brodie, 1999). The Kaiser Family Foundation (2004) found that watching TV and movies has a larger effect in lowering a child’s metabolic rate than if they were sleeping.

Children’s eating and nutritional habits play a role in the risk of obesity, and children’s food intake has changed dramatically over the past 3 decades. According to surveys from the USDA, there has been an overall decrease in the consumption of milk, vegetables and eggs, and increase in foods such as chips, cheese, candy, fried potatoes, and soft drinks (Enns, Mickle, & Goldman, 2002). This is an important finding because in large quantities these foods create a risk for childhood obesity (Ludwig, Peterson, & Gortmaker, 2001). Furthermore, television watching may contribute to higher fat intake (French, Story, & Jeffery, 2001) as children snack more while watching television. Television viewing is also related to the intake of less nutrient-rich foods and time spent watching television is linked to the consumption of foods advertised on television (Kotz & Story, 1994). Advertisements in the media play a role in childhood obesity, as children watch an estimated 40,000 ads on television per year. Of the ads targeted to children, 32% featured candy, 31% cereal, and 9% fast food (Kaiser Family Foundation, 2004). The fast food industry alone will spend 3 billion dollars this year for ads aimed at children (Kaiser Family Foundation, 2004).

Because inactivity is significantly and positively related to total body fat in boys and girls (Crespo et al., 2001), children who become more active and reduce caloric intake will reduce weight. In addition, there is a link between the amount of time children spend watching TV and body weight, and interventions that reduced children’s media time have resulted in weight loss (Kaiser Family Foundation, 2004). The odds of being overweight are 4.6 times greater for a child who watches more than 5 hours of television per day compared to a child who only watches 0-1 hours. Consequently, 29% of obesity incidence in children can be prevented by limiting television use to 0-1 hours per week. With obese children having a higher risk of developing Type II diabetes, hypertension, asthma, and heart disease, it is critical to find ways to decrease the amount of time children spend viewing media. Before reviewing studies that involve efforts to reduce media viewing, we will first examine traditional behavioral therapeutic methods to reduce obesity among youth.

Behavior Therapy

Over the past few years, behavior therapy has been successfully used to treat pediatric obesity (Epstein, Paluch, Gordy, Saelens, & Ernst, 2000; Epstein, Roemmich, & Raynor, 2001). Robinson (1999b) indicated that comprehensive behavioral treatment programs produce long-term weight control in up to one-third of pediatric participants. Aspects of the most successful programs include a group format with individualized behavioral counseling, parent participation, frequent sessions, and long treatment duration (Robinson, 1999a). As an example, Epstein and Squires (1987) used a family based behavioral treatment program to decrease obesity in children and found that parental involvement had a significant influence on Body Mass Index (BMI). Unfortunately, most families with children who are overweight or at risk of being overweight, particularly minority children, do not participate in these types of comprehensive treatment programs that so effectively reduce sedentary behaviors, cues, and opportunities associated with calorie intake and inactivity. It is critical to find new ways to involve children who are overweight or at risk of being overweight and their families in easy to implement and straightforward parent-child skill training programs. Such programs increase cues and opportunities for physical activity, self-monitoring, goal setting, contracting, and skills for maintenance and relapse prevention. One way this might be accomplished is to involve them in parent-child behavioral programs that reduce media use.

Dennison, Russo, Burdick, and Jenkins (2004) involved children aged 2.6 to 5.5 years of age in a seven-session program designed to reduce television viewing, whereas controls received a safety and injury
prevention program. Children in the intervention group decreased their television/video viewing by 3.1 hours per week, compared to the children in the control group who increased their viewing by 1.6 hours per week. In the 2nd Investigators Workshop on Innovative Approaches to Prevention of Obesity, Dr. Kumanyika referred to Dennison’s study and mentioned that while there was no change in the BMI scores for the intervention group, there was a slight increase in the control group, suggesting that this intervention was beneficial. In a study by Robinson et al. (1999a), third and fourth-grade students in one elementary school received an 18-lesson, 6-month classroom curriculum to reduce television, videotape, and video game use. Compared with students in a control school, children in the intervention group had statistically significant decreases in BMI, and these changes were accompanied by statistically significant decreases in children’s reported television viewing as well as meals eaten in front of the television. In another study, Gortmaker et al. (1999) worked with five intervention and five control schools. A two year intervention involved working with middle school classroom teachers who incorporated lessons that worked on decreasing television viewing, increasing physical activity, reducing the consumption of high fat foods, and increasing the consumption of more servings of fruits and vegetables. The intervention reduced the prevalence of obesity for girls.

Faith et al. (2001) evaluated the effects of contingent TV with 10 obese children. Those in the experimental group were required to pedal a stationary cycle to view TV, whereas the controls’ TV viewing was not contingent on pedaling. The study lasted 12 weeks following a two week baseline period. During the treatment phase, the experimental group pedaled 64.4 minutes per week compared with 8.3 minutes for controls. The experimental group watched 1.6 hours of TV per week as compared to the controls who watched 21 hours per week. In addition, those in the experimental group showed significantly greater reductions in total body fat and percent leg fat. The study suggests that contingencies in the home environment can significantly increase physical activity and reduce TV viewing, and therefore establishing TV viewing as contingent upon exercise may be one method to treat childhood obesity. Epstein, Paluch, Consalvi, Riordan, and Scholl (2002) investigated the effects of manipulating sedentary behavior on physical activity and food intake. Thirteen 8-12 year old non-obese children participated and results highlighted that increasing sedentary behavior had an influence on physical activity and energy intake. Epstein, Paluch, Gordy, and Dorn (2000) evaluated the effect of reducing television watching and other sedentary behaviors as a component of a comprehensive obesity treatment program. Ninety families with obese 8- to 12- year old children were provided a complete family-based behavioral weight control program, differing in whether sedentary or physically active behaviors were targeted. Both approaches were associated with significant decreases in percent overweight, body fat, and improved aerobic fitness. It appears that reducing sedentary behaviors is an important adjunct in treatment programs directed at pediatric obesity.

Devices on the Market

Devices to help parents manage content, such as the V-chip, have been unsuccessful in terms of their adoption and use, despite being available now in the majority of televisions (Jason, & Hanaway, 1997). Similarly, most parents have not adopted website filtering technologies despite their being readily available. Given the limited utilization of these approaches, a promising arena might involve developing social-learning programs for families that impact parent-child relations and socialization practices. Several products, such as computerized channel locks, are available on the market to deal with the problem of children’s excessive media viewing; however, they can be expensive and can only be used on a small number of television sets. In addition, these computerized devices cannot be inserted on older sets. Because these systems rely on simple electricity to remain functional, if the set is unplugged, the programming can be cancelled. One limiting aspect of these systems is that they were designed to help block out undesirable channels, rather than reduce the amount of TV viewing or help children develop new interests. There are also several products on the market that enclose prongs on the TV cord into a lock, so that a child cannot watch any TV (Positive Impact, Electro-Lok, Plug-Lok, CPAC). The limitations with these systems are that
they completely prevent TV watching, as opposed to helping children reduce their watching and teaching time management and goal setting skills. Further, there are devices on the market to lock computers and to screen the content of the Internet. None of these devices aim to help parents re-socialize children’s behaviors and activities. It is important to theorize beyond simple electronic devices that do not explicitly recognize the many parent-child social-learning manipulations that might be responsible for treatment effects and their maintenance over time. Rather, it is important to think of how a technology might enable parents to learn new management strategies for dealing with the electronic media use.

A large portion of the research published on problems involving media has focused on TV and computer games, neglecting the important topic of the Internet. Greenfield (1999) found that 6% of the 17,251 persons surveyed met criteria for compulsive Internet use, and over 30% reported using the Internet to escape from negative feelings. The vast majority admitted to feelings of time distortion and inhibition when on-line. Even though some youngsters are spending excessive amounts of time with these types of media, there have only been a few studies done in this area. Some people argue that over the next decade, television will be displaced by online media such as the Internet (Kayany & Yelsma, 2000); therefore, devices to help parents control media exposure will need to include these newer technologies (Coffey & Stipp, 1997).

Role of Parents

Clearly, parents do play an influential role in how their children interact with media (Nathanson & Botta, 2003). Valkenburg, Krcmar, Peeters, and Marseille (1999) reviewed studies that have investigated the occurrence of television mediation in the home (how often parents restrict their children’s television viewing, how often they discuss television shows with their children, and how often they co-view). Valkenburg, Krcmar, Peeters, and Marseille (1999) found that parents of higher educational levels tended to restrict child viewing more often than parents of a lower educational level. For parents attempting to limit the negative impact of television, restricting what their children watch was the most direct way of accomplishing this. Comstock (1990) notes that parents determine, to a large degree, whether a child will be a light, moderate, or heavy user of different media sources through rules and structures. Nathanson (2001) found that parental mediation can inhibit negative media effects, and that parental mediation works by influencing how much attention they grant this medium (Nathanson, 1999). Smetana and Daddis (2002) found parental monitoring was associated with adolescents’ belief that parents have a legitimate authority to regulate personal issues. Scott, Fabes, and Wilson (1989) have determined that parental attitudes about children’s viewing are related to family interaction.

In a study conducted by the first author and his research team, 83 families were surveyed to assess the techniques they used to limit viewing (Sarlo, Jason, & Lonak, 1988). Results suggested that a significant proportion of the parents felt that their strategies were not effective. To successfully mediate children’s media use, many parents require the assistance of a behavioral training program that would help them learn to better manage their children’s interactions with and use of electronic media. Such a parent-child behavioral training program could help parents re-socialize their children’s behaviors and activities and it can also teach children behavioral skills to use their time more effectively. Parent’s monitoring and encouragement of other behaviors might cause children who are overweight or at risk of being overweight to gravitate toward more physical activity, increase the consumption of nutritious food, reduce exposure to commercials encouraging high sugar and fat content, and reduce sedentary behavior. Because supportive communications between parents and children do correlate positively with a child’s self esteem and social competence (Harter, 1998; Howes, Hamilton, & Philipsen, 1998), it is important for parent-child training programs to include supportive communications and a sense of involvement for the child.

*DePaul University Studies*
Since the late 1970s, the first author and his team of researchers at DePaul University have developed several successful methods for reducing the amount of time children spend watching TV (Jason & Klich, 1982; Jason, 1983). In these studies to be reviewed below, our team had predicted that reduced media use would increase children’s time to do other things. The actual aim of these interventions was to create a context in which parents and children can learn new behaviors.

Our parent-child training program has involved an electronic device that is used to create a context in which parents and children learn new behaviors, and parents re-socialize children’s behaviors and activities through interactions that are encouraged by the device. Before starting the behavioral parent-child training program, there is a one-hour instruction in the homes of the families. This intervention employs a standard behavioral contract that utilizes tokens earned by the child for positive, non-media activities that can be exchanged for short periods of access to various media sources. One of the true benefits of this intervention is that it is extremely straightforward and can be easily implemented.

Operant studies

In an earlier study that used behavioral contingencies, seven children in one African-American, inner-city family reduced their TV viewing by using a simple token exchange system whereby tokens were earned by engaging in a variety of school, play, or housework-related activities (Jason, 1984). In this study, the average amount of TV viewing for all children was initially 7.5 hours per day, but this was reduced to 3.7 hours per day with the contingency. Follow-up data indicated the improvements were maintained. The mother indicated that with the onset of the behavioral training program, her children began helping her with chores around the house. The program helped the children switch from having leisure time activities which were television dominated, to activities that were more interpersonal. The parents reported that the children played games with one another, developed new interests, and began using their time in more creative ways.

In order to automate this system, Durbin and Jason (1984) published an article that described a token-actuated timer for line-voltage devices. In his next set of studies, the first author and his research team used this device, which is almost identical to the Earn Time device. Using this device, parents were shown how they might create contingencies that would foster more productive leisure time activities. The first investigation involved an eight and a half-year old male who reduced his TV watching from 6.4 hours during baseline to .9 hours during follow-up. An operant ABAB design was used with a follow-up data collection phase (Jason & Rooney-Rebeck, 1984). The time log at the baseline indicated that the target child spent 7 hours watching TV, 3 hours playing games alone, 2 hours bowling and 2 hours alone per day. At the follow-up point, the target child spent 1 hour watching TV, 2.5 hours doing homework, 4 hours playing games with a friend, 3 hours playing games alone and with family members, 1 hour helping his mother do chores, and 2 hours at meals. The family had no difficulty complying with the directions, and training in the behavioral system and record keeping took only 1 hour.

In a replication operant study, similar positive findings were found with the automated token meter (Jason, 1985). In this study, a parent recorded daily the number of tokens deposited in the timer (only the parent had a key to open the timer and retrieve the tokens) and the light pattern for the tokens (the lights were in a binary pattern and the parent was unaware as to what the light pattern referred). The average reliability over an 18 day time period was 99%. For this second study, tokens were earned for participation in certain positive activities such as reading, doing chores, or playing with friends. The target child's average TV viewing was decreased from 7 hours at baseline to 1 hour at a 9-month follow-up. Moreover, consumer satisfaction ratings were extremely high for the target child and her mother. Again, training to use this behavioral system and training in record keeping took only 1 hour.

Another study using a similar token activated meter, conducted at DePaul University, involved three families. Results revealed that in addition to reductions in TV viewing, there were significant
increases for all participants in activities such as reading, sports, and homework (McCanna, 1987). The most significant gains, however, were in activities requiring interpersonal contact, i.e., playing with friends and parents. Reduced media use increased children’s available time to do other things, and parent’s monitoring and encouragement of other behaviors caused children to gravitate toward constructive educational and social activities. Training for this study took 1 hour, and the parents did not experience any difficulties in implementing the program.

In a subsequent study (Jason, 1987), two families were recruited and a multiple baseline design was employed. Similar to the procedure of the earlier study, each day a parent recorded the number of tokens deposited in the timer and the binary light patterns for the tokens (again, the parents did not know what the light pattern referred to). Average reliability over 35 days with the number of tokens deposited and the light pattern was 99%; inter-rater reliability on the dependent variable was 95%. Excessive TV viewing was reduced from an average of 5.3 hours and 7.7 hours at baseline, to 1.6 hours and .6 hours respectively at follow-up, which was approximately 200 days following the intervention. In addition, data from a time log used to replicate the prior study indicated that the children became more active and more involved in chores, playing with others, and completing homework. Once again, our research team found that reduced media usage translates into gains in other critical areas. Training in implementing the program and record keeping took only 1 hour.

A final study using the token activated meter employed another operant design (i.e., ABCBCB) and similar reductions in TV viewing were noted. Similar to the previously mentioned studies, a parent recorded the number of tokens deposited in the timer and binary light patterns for the tokens daily. Average reliability, over 61 days, with the number of tokens deposited and the light pattern was 97%. Once again, important positive changes were noted in homework and reading (Jason, 1987). Inter-rater reliability for the dependent variables was above 95% for TV viewing, minutes of homework and extracurricular reading. Consumer satisfaction ratings for children in all of the above studies using the token activated meter were extremely positive. Training for the parents took 1 hour, and no difficulties were encountered in implementing the program or in record keeping.

In the early 1990s, the first author and his research team began investigating several other types of devices that were being marketed for reducing children's excessive TV viewing. For example, one type of television locking device is called “The Switch”. It can be attached to the cord of any TV set, allowing parents to “lock” the television with a key, thereby prohibiting television viewing. Jason, Johnson, and Jurs (1993) assessed the effectiveness of this device using an operant research design, and they found that it decreased the amount of television viewed by the two involved children. In another study, Johnson and Jason (1996) found that a computerized television lock, called "SuperVision," was effective in reducing the number of hours two children spent watching television. The above mentioned devices were limited in that they only prevented TV viewing, and therefore, did not re-structure the socialization activities or social learning experiences of parents and children. In contrast, parent-child behavioral programs using token activated meters do have the potential of creating a context in which parents and children learn new behaviors that are encouraged by the device.

During the 1990s, Jason and his team completed additional studies with another contingency device. In one study, a 9-year old male with Down’s Syndrome was allowed to watch TV contingent upon exercising on a bicycle (Jason & Johnson, 1995). His mother reported that he was waking up in the middle of the night to watch television prior to beginning the program. He had been watching a daily average of 6.4 hours of TV during the 20-day baseline for the experiment (3.9 hours with TV; 2.5 hours with Nintendo). During the intervention, where the child was required to earn time to watch, he reduced his TV use to 2.7 hours a day (1.5 with TV; 1.2 with Nintendo). At a five-month follow-up, where the child again had free access to television, his total viewing was only 1.8 hours. Several family members mentioned that the target child had lost weight and began riding bikes even without rewards, as the child began enjoying the activity.
Adequate inter-rater reliability was found and consumer satisfaction ratings were once again extremely positive. Only 1 hour was needed to train the parent in the behavioral system and record keeping.

The next study (Jason & Brackshaw, 1999) involved an overweight child who was watching an excessive amount of TV (averaging over 4 hours per day). The parent indicated that her child previously had temper outbursts as a result of attempts to restrict TV viewing. The inner-city parent was provided instructions on behavioral parent training, contingency management, and record keeping in 1 hour, and no difficulties occurred in implementing the intervention or in collecting data. After collecting baseline data, the child was required to ride a bicycle for 60 minutes in order to watch an equivalent amount of TV, consequently, this program successfully reduced TV viewing. Once the behavioral parent training system was introduced, immediate reductions in TV viewing occurred, and the parent reported that the child did not object to exercising in order to earn the right to view TV. Paired with the child’s increase in exercise and reduction of TV viewing, she became more active by getting involved in a variety of outside activity programs. With the time that she had previously dedicated to watching TV, she was now playing with friends and involved in several sport-related programs. These activities became self-reinforcing and along with the help of the parent, the re-socialization of the child’s behaviors and activities, probably accounted for the maintenance of low TV viewing following the termination of the formal intervention. A 20 pound weight loss was maintained at the one year follow-up. This study along with the prior studies reviewed above suggest that children who begin to spend time playing active games and sports will likely find them rewarding in themselves.

Discussion

It is important to note that in the research cited in the introduction concerning the negative effects of high levels of media exposure, many of these investigations employed cross-sectional, non-longitudinal designs, which are unable to rule out important threats to internal validity, especially selection effects. In addition, the effect sizes of the negative outcomes of media exposure have sometimes been modest. Still, the evidence clearly indicate that media have effects on our youth. For example, in an important review article, Anderson et al. (2003) concluded that media violence has a modest direct effect on serious forms of violent behavior, and an even larger impact on aggression. For many, the negative effects of childhood exposure to media violence extend into adulthood.

Regardless of whether one believes that media has a negative influence on children’s behavior, the majority of social scientists and parents feel that excessive viewing is not in the best interest of children. To solve this problem, parents need to become more involved in this issue, and our studies show one way this can be accomplished. The key in our parent child training program has been to use Earn TV as a mechanism to help parents re-structure the socialization activities or social learning experiences of their children. As has been stated earlier, changes in parenting management of media use are a critical mediator of the potential treatment effects for reducing children’s weight. The parent-training programs described in this article can help reduce media use and as a consequence might increase children’s time to do other things, however, parents’ monitoring and encouragement of other behaviors is essential for the success of this intervention. Clearly, this training program can help set the context for changes in the parents’ management of media use.

In summary, our research team has been working on parent-child behavioral training programs for over 20 years, and we have been effective in decreasing inappropriate media viewing, increasing academic performance, and re-structuring the socialization activities or social learning experiences of their children. The parent-child training program has also been used to reduce media use in children who are overweight or at risk of being overweight, and such a program encourages children to become more active and less sedentary. We believe that parents learn to better monitor electronic media use, consistently apply rules for children’s media use, and encourage other non-media behaviors. Such a program can help children gravitate toward activities that result in higher activity levels, less exposure to commercials featuring high sugar and
high fat foods and drinks, less snacking in front of television, and consequent weight loss. As parents improve on implementing contingencies, they will also be better able to help their children decrease saturated fat and sugar intake and to eat healthier foods. However, until these findings are replicated with larger samples and with appropriate comparison conditions, we need to remain cautious about how these findings might be extended to larger groups and whether these types of positive outcomes can also occur in less controlled situations.

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Keeping Families In Once They’ve Come Through the Door:
Attrition in Parent-Child Interaction Therapy

Melanie A. Fernandez and Sheila M. Eyberg

Abstract

We review existing studies of attrition in Parent-Child Interaction Therapy (PCIT), an empirically supported treatment for preschool-aged children with disruptive behavior disorders. Variables identified as pretreatment predictors of attrition in a statistically derived search for pretreatment predictors included maternal distress, negative maternal verbal behaviors during parent-child interaction, and therapist verbal behaviors during initial parent-therapist interactions. The most frequently reported reasons provided by mothers for premature termination of treatment were logistical problems such as difficulty finding transportation or sibling child care. Continued study of variables related to attrition in PCIT is essential to retention of a greater number of families in treatment.

Keywords: Attrition, Dropout, Parent-Child Interaction Therapy.
criteria. Parents are required to meet these criteria before moving from one phase of treatment to the next and before treatment graduation (Brinkmeyer & Eyberg, 2003; Eyberg, 2005).

During the Child-Directed Interaction (CDI), parents learn specific verbal behaviors that function to reinforce positive child behavior, such as reflecting the child’s talk, describing the child’s play, and praising the child’s positive behaviors with their parent. Parents also learn to avoid questions, commands, and criticisms that can be intrusive and provide attention to negative behaviors. When coaching, therapists use differential social attention to shape parents’ interaction skills. Simultaneously, children acquire social interaction and cooperation skills through similar operant conditioning procedures used by their parent (Harwood & Eyberg, in press).

During the Parent-Directed Interaction (PDI), parents learn a consistent and predictable discipline procedure used to increase child compliance to developmentally appropriate directives. While continuing to give positive reinforcement for appropriate behaviors, parents learn to give clear, direct commands and to follow through with a set sequence of responses to the child’s compliant or noncompliant behaviors. If the child complies, the parent positively reinforces the compliance. If the child does not comply, the parent commences the time-out procedure (Brinkmeyer & Eyberg, 2003).

PCIT results in marked increases in positive parenting behaviors, such as praise and reflective listening, and decreases in negative verbal and physical behaviors toward the child during parent-child interactions. Children show marked increases in compliance to parent directives and decreases in disruptive behaviors such as back talk, yelling, and whining (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg et al., 2001). Studies show generalization of changes to untreated siblings (Brestan, Eyberg, Boggs, & Algina, 1997) and to children’s school behavior (Funderburk et al., 1998), and parents report decreases in parenting stress, a more internal locus of control, and high levels of satisfaction with treatment (Nixon, Sweeney, Erickson, & Touyz, 2003; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998). Treatment continues until parents demonstrate mastery of the interaction skills and rate their child’s disruptive behavior at home within normal limits. Therefore, completing treatment is considered treatment success. Attrition is considered treatment failure.

Attrition is broadly defined as premature termination decided unilaterally by a patient against therapist advice (Armbruster & Kazdin, 1994). In PCIT, attrition is operationally defined as discontinuing treatment at any point after attending the first treatment session and before meeting the treatment completion criteria. In research, attrition is problematic because it interferes with the random composition of research groups, reduces statistical power, and limits external validity of findings (Kazdin, 1990). Clinically, attrition is concerning because children who drop out make fewer gains across more limited domains (Kazdin, Mazurick, & Siegel, 1994).

To date, two studies have addressed predictors of attrition in PCIT. In the first study, Werba, Eyberg, Boggs, and Algina (in press) explored pretreatment predictors of attrition by comparing treatment completer (n = 33) and dropout (n = 17) families on demographic characteristics (e.g., SES), maternal characteristics (e.g., maternal IQ), observed behavior management skills (e.g., caregiver prosocial behavior toward child), and child characteristics (e.g., severity of disruptive behavior). Variables that differed at p < .10 were entered into a multiple regression analysis. The only variables found to predict treatment dropout in this sample were maternal distress, a variable created by combining scores on the Beck Depression Inventory and Parenting Stress Index, and negative maternal verbal behavior (critical and sarcastic comments) directed to the child. The overall classification rate for predicting group membership was 64% (71% for completers, 56% for dropouts; Werba et al.).

A subset of 46 families examined in the Werba et al. (in press) study were recruited for participation in a long-term follow-up study of treatment dropouts and completers (Boggs et al., 2004).
Results showed significant differences at follow-up between groups, with families who dropped out of treatment showing no changes from pretreatment levels at one to three years after entering treatment (Boggs et al.). Families in the Boggs et al. study who had discontinued treatment prematurely were asked to report their reason for not completing treatment. Their primary reasons included logistical problems, such as being unable to obtain transportation or child-care for siblings (n = 11, or 35%); feeling that treatment was not progressing quickly enough or feeling unable to wait for treatment to begin (n = 6, or 19%); and dislike of the treatment approach or techniques (n = 5, or 16%).

In a new sample of families, Harwood and Eyberg (2004) marked a shift in focus from parent, child, and family characteristics to the therapy process variables in PCIT. Their study considered the role of therapist behaviors during early interactions with parents as predictors of treatment completion status. Findings suggested that families whose therapists made fewer facilitative (e.g., Uh huh, Okay) and more supportive (e.g., It seems like things have been very difficult managing Joey’s behavior) statements and asked more closed-ended questions during the initial interview were more likely to drop out of therapy. Group membership was correctly classified for 68% of families based on these three therapist verbalization categories. Although not measured in this study, the parent verbalizations in these therapist-parent interactions appeared to play a contributing role in the findings (Harwood & Eyberg). In addition, SES was not examined as a predictor in this study based on the absence of SES differences in the earlier sample (Werba et al., in press). However, Harwood and Eyberg found significant SES differences, with lower SES in the dropout than completer groups.

Studies to date have identified few pretreatment predictors of PCIT attrition. The identified variables – maternal distress, maternal verbal behavior behaviors with their child, and therapist verbal behaviors with parents – provide clues to other potentially important variables to explore. For example, finding that therapist supportive statements were related to later dropout raises questions about the statements that pull for therapist support as well as the extent to which supportive statements might inadvertently reinforce parent feelings of helplessness or hopelessness about change. The therapeutic alliance during treatment has also been implicated in attrition from child and family therapy (Garcia & Weisz, 2002; Robbins, Turner, & Alexander, 2003), but little is known about its role during PCIT. The strength of the therapist-parent alliance might particularly be expected to influence attrition of distressed mothers and calls for further study.

Evidence of maternal psychopathology as a factor in attrition also raises questions about paternal characteristics that may play a role. Fathers have a treatment participation rate of approximately 50% in PCIT, and our research with fathers suggests that their involvement may improve long-term outcomes (Bagner & Eyberg, 2003). At the same time, there is evidence suggesting higher occurrence of antisocial personality features among fathers of children with DBDs (Faraone, Biederman, Mennin, Russell, & Tsuang, 1998), which have been associated with resistance to parent training (Stoolmiller, Duncan, Bank, & Patterson, 1993). Such findings suggest that characteristics of paternal psychopathology will be important to examine as potential predictors of PCIT attrition. Finally, attrition from the follow-up phase of treatment is completely unstudied. The importance of clinical follow-up of families to assure maintenance of treatment gains is increasingly recognized. Early identification of relapse enables reversal of decline with minimal intervention (Eyberg, Edwards, Foote, & Boggs, 1998), which can ultimately improve long-term outcomes. Examination of factors that predict follow-up attrition warrant future research attention.

Early intervention in the development of DBDs is critically important given their stability and associated impairment. At least 20% of children in need of psychological services do not receive them (Pavuluri, Luk, & McGee, 1996). Families who succeed in overcoming barriers to treatment entry face another set of barriers with treatment participation, making their retention decidedly consequential. By
studying attrition, we learn most accurately how to keep these families in once they’ve come through our doors.

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CABAS Parent Education: Increasing Child Compliance via Parental Emission of Unflawed Commands and Contingent Consequations During Play

Ara J. Bahadourian and R. Douglas Greer

Abstract

This study examined the efficacy of the parent education/training program of the Comprehensive Application of behavior Analysis to Schooling (CABAS) model (Greer, 2000) in increasing rates of child compliance. Five parents of children attending a CABAS special needs preschool received both didactic instruction and home-based in vivo training in the use of flawless antecedent commands and contingent consequations (including verbal and physical positive reinforcement, planned ignoring, and physical follow-through) during weekly toy playing, sharing and clean up sessions with their siblings. The study incorporated a multiple probe design using five parents who started receiving parent training on different days, resulting in a variation of a delayed multiple baseline across subjects design. Results indicated that rates of child compliance increased for all five children as a function of parental expertise in emitting unflawed commands and providing contingent consequations for their children. The collateral benefits of the parent program included (a) a reported increase in the frequency and duration of independent toy playing and sibling sharing repertoires and (b) an establishing operation effect for the target student whose increased rate of compliance may have been related to parental verbal and physical positive reinforcement of sibling compliance to parental commands. The effectiveness of the CABAS parent education component was discussed in relation to the comprehensive, perpetual, and interlocking school-home contingencies inherent in the entire CABAS model.

Keywords: CABAS, Compliance, special needs children and parent training.

Greer (2002) suggests that the key to more effective schooling requires the systematic and comprehensive application of behavior analysis to schooling (CABAS) to all parties involved in the instructional contingencies, including students, teachers, supervisors, and parents. CABAS incorporates features of direct instruction (Engelman & Carnine, 1982), precision teaching (Lindsley, 1990), the personalized system of instruction (PSI) (Keller, 1968), programmed instruction (Skinner, 1968), the consulting behavior analyst model (Greer, 1989), and an organizational behavior management approach to the supervision and administration of schooling (Reid & Shoemaker, 1984).

Several studies have demonstrated the effectiveness of the CABAS package in improving the performance of students, teachers, and supervisors in the school environment (Selinske, Greer, & Lodhi, 1991; Greer, McCorkle, & Williams, 1989; Ingham & Greer, 1992; Lamm & Greer, 1991) The efficacy of the parent education component of the CABAS package in the home environment has not yet been comprehensively and systematically studied. This line of research is imperative in light of the fact that "any changes brought about in the school environment are limited in their ability to prevent mental health problems. A complete attack must include changes in the home environment where the child spends most...of his early years" (Hawkins, 1972, p. 30). Given the importance of effective parenting in the early prevention of psychological and physical child abuse (Altepeter & Walker, 1992); juvenile delinquency (Wells & Forehand, 1985), special education placement, mental health and academic learning problems, and Ritalin usage, it is necessary to investigate and establish functional relationships between specific parenting (antecedent and postcedent) behaviors and child compliant responses.

Forehand (1977) noted that child non-compliance with parental commands and instructions is reported as the most frequent child problem in families. Non-compliant children have mothers who typically emit vague or flawed commands (Barkley, 1987; Forehand & McMahon, 1981) and provide fewer contingent consequations for their child's non-compliant behaviors (Meharg & Lipsker, 1992). The efficacy of instructing parents on how to give clear or unflawed commands and to use contingent praise, planned ignoring, and physical guidance to increase child compliance is well supported by the behavioral parent training literature (Graziano & Diament, 1992).

Although there are numerous comprehensive behavioral parent training models in the form of commercially packaged programs (Becker, 1971; Patterson, 1975; Hall, 1981; Dangel & Polster, 1984), CABAS is the only model known to this experimenter which applies behavior analysis in a comprehensive manner to
everyone in the child's environment including teachers, supervisors, parents, peers, and siblings. Therefore, CABAS provides continuity of antecedent and postcedent contingencies both in the child's classroom and home environments. In other words, children who are educated and managed by the CABAS model are exposed to similar antecedent and postcedent contingencies by teachers as well as their parents. The CABAS parent training/education program teaches children to comply with parental unflawed commands during reinforcing play sessions while at the same time conditioning longer periods of independent toy playing which in turn produces more compliant behaviors. Additionally, CABAS utilizes siblings during play and clean-up sessions so they both receive parental verbal and physical positive reinforcement for compliance at the same time that parents are applying planned ignoring (during play and clean-up sessions) or physical guidance (during clean-up sessions only) for the target child's non-compliance. This study examines the efficacy of the CABAS parent education component in increasing child compliance rates in five different families.

Method

Subjects

Five parents (Parents B, H, M, F, and O) ranging in age from 30 to 38 with varying socioeconomic and educational backgrounds voluntarily enrolled in a CABAS Parent Education/Training Program affiliated with a CABAS preschool for special needs children. All five parents were concerned about their sons' noncompliant behaviors and, therefore, participated in the program in order to acquire the skills necessary to teach their sons to follow parental instructions and commands. All five children were four year olds who had been placed in a CABAS preschool to address language, social behavior, and learning problems. Their teachers had also described these five children as being noncompliant when they entered the school.

Setting

The CABAS program was conducted in the children's home for four of the families. Parent F received training in the conference room within the school building. The parent educator/experimenter met each parent (except for Parent H) once a week for approximately an hour session. Parent H received two sessions per week of parent training because of their son's intensive behavioral needs. All training sessions involved a play and sharing period with a sibling followed by a clean-up phase where children were instructed to put away their toys.

Definition of Variables and Behaviors

The independent variable consisted of the CABAS Parent Education/Training package which included (a) formal instruction in behavior analytic principles (e.g., elementary terminology) and (b) parent trainer's in vivo modeling, correction, prompting/cueing, and reinforcement of parental use of antecedent commands and contingent consequations for their child's compliant behaviors.

The dependent variables were (a) parental rates of contingent and noncontingent consequations, (b) parental rates of flawed and unflawed antecedent commands, and (c) rates of child compliance.

The definitions below were based on those provided by Williams (1992). A contingent consequation consisted of any discrete verbal or physical (e.g., a hug) positive response which the parent delivered to the child for beginning to comply within five seconds of a command. Any positive correction or prompting (e.g., pointing while saying, “It goes there.”), modeling (e.g., demonstrating how to place a toy gently in the toy box), physical guidance or follow-through (i.e., fully physically assisting the child to pick a toy after the command was given and not followed), and planned ignoring procedure that was contingently emitted by a parent was recorded as a contingent consequation.

Non-contingent consequation consisted of any verbal disapproval, physical punishment, absence of correction, failure to respond appropriately to the child for non-compliance, the absence of positive reinforcement for compliance, and any verbal or physical reinforcement for non-compliance to both flawed or unflawed commands.
A command was counted as unflawed when it met the following criteria: (a) linguistically it consisted of a phrase with an observable, active, and an imperative verb with a specific object or an adverb, (b) the above phrase was not followed by a lengthy explanation, and (c) it was spoken in a normal volume of voice.

A flawed command included any command which was not understandable to the experimenter including (a) an omission of an observable, active, and imperative verb with a specific object or an adverb, (b) a rhetorical question, (c) an unflawed command confounded by a lengthy explanation, (d) a statement or question which left a particular response in doubt (e.g., "Stop doing that!"). (e) words such as "please" or "okay?" at the end of a command, and (f) any sentence with a rising inflection at the end of the statement making it a question.

Child compliance was defined as any appropriate behavior (e.g., touching sister gently, walking to the toy box) emitted by the child within five seconds of the parent's flawed or unflawed command including the child's correct or incorrect vocal responses to parental questions.

Design

The experimenter utilized a multiple probe design resulting in a variation of a single-subject delayed multiple baselines design across subjects involving five students from five different families.

Procedure and Data Collection

During the baseline (probe) phase, the experimenter videotaped parent-child interactions and then recorded (a) rate per minute of parental emission of antecedent flawed and unflawed commands, (b) rate of parental emission of contingent and non-contingent consequations, and (c) rates of child compliance to parental antecedent commands.

CABAS parent education was implemented on different days for each family. Each parent was given learning modules consisting of (a) reading assignments and completing quizzes on topics such as providing unflawed commands, verbal praise, planned ignoring, and physical guidance and (b) in vivo practice in emitting unflawed commands and appropriately using verbal praise, planned ignoring, and physical follow-through or guidance during play time or clean up activities.

The experimenter taught these skills to parents during the intervention phase by using modeling, shaping, correction, prompting, role-playing, and positive reinforcement procedures during and/or after (e.g., videotaped playback/feedback) each training session. The experimenter's prompting and reinforcement of parental use of antecedent unflawed commands and contingent consequations (for child compliant behaviors) were gradually faded during the intervention. The experimenter continued to record (a) rate per minute of parental use of antecedent flawed and unflawed commands, (b) rate per minute of parental use of contingent and non-contingent
consequences, and (c) rate per minute of child compliance throughout the treatment phase.

![Parent training and education graph](image)

**Figure 1-** The rate/minute of parent flawed and unflawed commands compared to the rate of child compliance/session for parent child dyads B, H, F, M, and O during probe phase.

**Results**

Parent B increased child compliant behaviors from a baseline rate of near zero to an average rate of 2 compliant behaviors per minute during treatment. Parental emission of flawed commands decreased from a baseline rate of 1 per minute to zero during treatment. Unflawed commands increased from a baseline rate of zero per minute to an average rate of 1.5 per minute during treatment. Parental emission of contingent consequations increased from zero to an average rate of 2 per minute. Non-contingent consequations decreased from a baseline rate of 1.5 to zero during the intervention phase.

Parent H increased child compliant behaviors from zero during baseline to an average rate of 2.5 compliant behaviors per minute. Parental use of unflawed commands increased from zero during baseline to an average rate
of 2.5 unflawed commands per minute during treatment. Flawed commands decreased from a rate of 2.5 during baseline to near zero during treatment. Contingent consequations increased from once every two minutes to an average of 5 contingent consequations every two minutes. Non-contingent consequations decreased from one per two minutes during baseline to zero per minute during intervention.

Parent M increased child compliance from a baseline rate of near zero to an average rate of 1 per minute during treatment sessions. Parental emission of unflawed commands increased from a baseline rate of near zero per minute to an average of 1 per minute. Parental use of flawed commands decreased from about 3 per minute to near zero. Contingent consequations increased from near zero per minute to an average of 1 per minute whereas non-contingent consequations decreased from about 3.5 per minute to an average of 1 per two minutes.

Parent F increased compliant behaviors from near zero during baseline to an average rate of 1 per minute. Parental emission of flawed commands decreased from a baseline rate of 2 per minute to near zero during treatment. Flawless commands increased from near zero to an average rate of 1 per minute. Parental use of contingent consequations increased from near zero to slightly over 1 per minute whereas the emission of non-contingent consequations decreased from near 1 per minute to zero during treatment.

Parent O increased the rate of child compliance from near zero during baseline to an average rate of 1 per minute during intervention. The use of flawless commands increased from zero to near 1 per minute whereas flawed commands decreased from a rate of 2 per minute during baseline to near zero per minute. Parental emission of contingent consequations increased from zero to slightly over 1 per minute whereas the use of non-contingent consequations decreased from 2 per two minutes during baseline to 1 per two minutes during intervention.

FIGURE 2, NEXT PAGE
Discussion

There are a number of explanations for the increase in the rate per minute of child compliant behaviors in this study aside from the documented efficacy of parental use of (a) verbal antecedents (i.e., unflawed commands) and (b) contingent consequations (including verbal and physical reinforcement, planned ignoring, and physical follow-through) (Merrell, 1987; Meharg & Lipsker, 1992; Graziano & Diament, 1992). The comprehensive nature of CABAS continuously monitors and controls antecedent presentations and consequations by teachers as well as by parents thereby providing continuity of behavior management principles in both home and school settings on a sustained basis (Greer, 1991; Greer, 1992). The CABAS parent education package is also comprehensive in its diversity of behavior analytic content as well as variety of instructional methods (including didactic instruction, videotaped presentations, and in vivo modeling, shaping, correction, role-playing, and feedback) which incorporate features of precision teaching, PSI, programmed instruction, direct instruction, the consulting behavior analyst model, and an organizational behavior management approach to the supervision of parent trainers/educators.
The CABAS parent education program teaches (conditions) children to comply to parental unflawed commands during toy playing and sharing sessions (e.g., "Please hand your sister this car.") thereby increasing the probability of future child compliance to parental commands in non-play settings. These play and sharing situations also provided an opportunity for parents to practice using verbal and physical reinforcement and planned ignoring while clean-up situations allowed them to practice the very difficult skill of physical guidance or physically following through to assure compliance to a parental command (e.g., "Please put this car in the toy box."). Although separate data were not collected on the duration and frequency of sibling sharing and independent toy playing in the absence of the parent educator, all five parents reported significant increases in their child's ability to share and play on their own for longer periods of time possibly as a function of the frequent verbal and physical reinforcement provided by parents to both the target child and sibling for toy playing and emitting prosocial behaviors during toy playing sessions (Greer et al., 1985). The establishing operation effect (Keller & Schoenfeld, 1950), created by the verbal and physical reinforcement of a sibling for compliance to parental commands (while at the same time systematically ignoring the target child for non-compliance), was an extremely powerful technique for increasing child compliance.

The results achieved by the sole techniques of unflawed commands, verbal and physical reinforcement, planned ignoring, and physical follow-through are noteworthy because parents did not have to rely on dispensing tangible or edible reinforcers nor were they taught cumbersome and time-consuming programs such as time out and token economy during the time of this study. The success of the CABAS parent training/education program is remarkable considering the fact that the experimenter as parent educator spent an average of only one hour per week with each of the five families. Considering the finding that "...the more Teacher Performance Rate/Accuracy observations done by supervisors, the more accurate were teachers and this led, in turn, to more correct responding from students" (Greer, 2002), one wonders how many more three-term contingency trials or learn units (Albers & Greer, 1991) teachers in CABAS classrooms receive from their supervisors than parents receive from parent educators on an average week.

With the advance of video technology, the CABAS parent education program may consider the possibility of installing on-going home videotaping of parent-child interactions in the absence of parent educators in the home in order to (a) increase correct antecedent and postcedent (i.e., learn unit) presentations for parents during videotaped playback/feedback training sessions and (b) solve the long-standing problem of the reliability and validity of parent data.

The CABAS parent education program can be improved by expediting the feedback given to parents during in vivo training sessions via bug-in-the-ear electronic devices. The current CABAS parent training practice of (a) waiting until the end of each session or observing videotaped playbacks do not provide the immediate feedback crucial to skill acquisition and (b) giving verbal feedback to parents in the presence of their young children during in vivo training may undermine parental authority and efficacy.

The limited baseline data obtained prior to the implementation of the CABAS parent program was a major weakness of this study because of ethical (i.e., parental right to prompt treatment) and practical (i.e., trainer time constraint) considerations. The lack of reliability data during non-videotaped treatment sessions constituted another major shortcoming.

Careful analysis of the data revealed that rates of child non-compliance increased during periods when (a) the CABAS school was not in session, (b) parent trainers did not visit homes, and (c) parents cancelled parent training sessions. The critical issue of long-term maintenance and generalization of parenting skills (Webster-Stratton, 1990; Powers, Singer, Stevens, & Sowers, 1992) may be addressed by the CABAS parent education program via the use of a bug-in-the-ear immediate parental feedback system, increasing learn unit opportunities for parents by trainers, and continuous videotaping of in vivo parent-child interactions (when the trainer is not present in the home) during baseline, treatment with prompting, treatment without prompting, and post-treatment follow-up phases.

As noted earlier in this paper, there are several excellent comprehensive commercially available behavioral parent training programs. The CABAS model, however, is different because it applies behavior analysis on an on-
going school-wide as well as home-wide basis continuously monitoring the responses of all of the players in a child's life including his parents, teachers, school administrators, and parent trainers. CABAS exemplifies the type of educational research advocated by Slavin (1990) and Fuchs and Fuchs (1990) which helps develop and test systemic school-based models offering robust solutions instead of studying discrete, isolated, or decontextualized variables.

Childhood non-compliance and oppositional behaviors are generally considered to be (a) among the most commonly seen problems referred to child guidance clinics (Meharg & Lipsker, 1991) and (b) precursors to childhood aggression, psychological and physical child abuse, juvenile delinquency, special education placement in classes for the "emotionally disturbed," Ritalin usage, and mental health problems. In light of the increase in the rates of child compliance reported in the present CABAS home study along with the encouraging results of previous CABAS school studies (Greer, 2002; Selinske, Greer, & Lodhi, 1991; Greer, McCorkle, & Williams, 1989; Ingham & Greer, 1992; Lamm & Greer, 1991), the entire CABAS model including its parent education component should continue to be replicated in various special and regular schools and communities across this country in spite of a widely cited educational psychologist who insists that the effect of applied behavior analysis "in the schools is limited and always will be" (Brophy, 1983, p. 12). This experimenter agrees with Brophy only in the sense that since children spend most of their time with their parents, applied behavior analysis must also be systematically, comprehensively, and continuously applied at home as well as in school so that its effects will not be limited. The data reported herein provide a beam of optimism that applied behavior analysis is not a piecemeal approach (Brophy, 1983) but rather a complex and pervasive one requiring sophisticated practitioners to carefully arrange and measure the antecedents and postcedents for children both in their school and home environments.

References


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