Education and Training in Autism and Developmental Disabilities

Focusing on individuals with autism, intellectual disabilities and other developmental disabilities

Volume 46 Number 1

March 2011
Education and Training in Autism and Developmental Disabilities
The Journal of the Division on Autism and Developmental Disabilities,
The Council for Exceptional Children

Editor: Stanley H. Zucker
Arizona State University
Mary Lou Fulton Teachers College

Editorial Assistant: Silva Hassert
Arizona State University
Mary Lou Fulton Teachers College

Consulting Editors
Martin Agran
Reuben Altman
Phillip J. Belfiore
Sharon Borthwick-Duffy
Michael P. Brady
Freedla Brown
Mary Lynne Calhoun
Sharon F. Cramer
Caroline Dunn
Lise Fox
Treasurer
Secretary
Vice President
President-Elect
President
Past President
Toni Merfeld
Debora Wichmanowski
Debra Cote
Carolyn Dunn
Lise Fox
Vernon E. Davies
Debra Cote
J. P. Treffinger
Debora Wichmanowski

Toni Merfeld
Mary Lou Fulton Teachers College

Education and Training in Autism and Developmental Disabilities is sent to all members of the Division on Autism and Developmental Disabilities of The Council for Exceptional Children. All Division members must first be members of The Council for Exceptional Children. Division membership dues are $25.00 for regular members and $13.00 for full time students. Membership is on a yearly basis. All inquiries concerning membership, subscription, advertising, etc., should be sent to the Division on Autism and Developmental Disabilities, 2900 Crystal Drive, Suite 1000, Arlington, VA 22202-3557. Advertising rates are available upon request.

Manuscripts should be typed, double spaced, and sent (five copies) to the Editor: Stanley H. Zucker, Mary Lou Fulton Teachers College, Box 871811, Arizona State University, Tempe, AZ 85287-1811. Each manuscript should have a cover sheet that gives the names, affiliations, and complete addresses of all authors.

Editing policies are based on the Publication Manual, the American Psychological Association, 2009 revision. Additional information is provided on the inside back cover. Any signed article is the personal expression of the author; likewise, any advertisement is the responsibility of the advertiser. Neither necessarily carries Division endorsement unless specifically set forth by adopted resolution.


Division on Autism and Developmental Disabilities
The Council for Exceptional Children

Board of Directors

Officers

PAST PRESIDENT Emily Bouck
PRESIDENT Teresa Taber-Doughty
PRESIDENT-ELECT Richard Gargiulo
VICE PRESIDENT Nikki Murdick
SECRETARY Toni Merfeld
TREASURER Gardner Umbarger

Members

Debra Cote
Mark Francis
Nicol Mucherino (Student Governor)
Robert Sandieson
Debora Wichmanowski
Dianne Zager

Executive Director
Tom E. C. Smith
Publications Chair
Michael Wehmeyer
Communications Chair
Darlene Perner
Conference Coordinator
Cindy Perras

The purposes of this organization shall be to advance the education and welfare of persons with autism and developmental disabilities, research in the education of persons with autism and developmental disabilities, competency of educators in this field, public understanding of autism and developmental disabilities, and legislation needed to help accomplish these goals. The Division shall encourage and promote professional growth, research, and the dissemination and utilization of research findings.

EDUCATION AND TRAINING IN AUTISM AND DEVELOPMENTAL DISABILITIES (ISSN 2154-1647) (USPS 0168-5000) is published quarterly in March, June, September, and December, by The Council for Exceptional Children, Division on Autism and Developmental Disabilities, 2900 Crystal Drive, Suite 1000, Arlington, Virginia 22202-3557. Members’ dues to The Council for Exceptional Children Division on Developmental Disabilities include $8.00 for subscription to EDUCATION AND TRAINING IN AUTISM AND DEVELOPMENTAL DISABILITIES. Subscription to EDUCATION AND TRAINING IN AUTISM AND DEVELOPMENTAL DISABILITIES is available without membership; Individual—U.S. $40.00 per year; Canada, PUAS, and all other countries $44.00; Institutions—U.S. $175.00 per year; Canada, PUAS, and all other countries $179.50; single copy price is $25.00. U.S. Periodicals postage is paid at Arlington, Virginia 22204 and additional mailing offices.

POSTMASTERS: Send address changes to EDUCATION AND TRAINING IN AUTISM AND DEVELOPMENTAL DISABILITIES, 2900 Crystal Drive, Suite 1000, Arlington, Virginia 22202-3557.
Manuscripts Accepted for Future Publication in
Education and Training in Autism and Developmental Disabilities

June 2011

Self-management procedures: A comparison across the Autism spectrum. Candice Southall and David L. Gast, Department of Communication Sciences and Special Education, University of Georgia, 516 Aderhold Hall, Athens, GA 30602.


Avoidant attachment style indicates job adaptation of people with high functional Autistic spectrum disorders. Kenji Yokotani, 9080-8576, Miyagi Prefecture, Sendai City, Adoba District, Kawauchi 27 - 1, JAPAN.

Developmental screening: A review of contemporary practice. Juli Pool and Jack J. Hourcade, Department of Special Education and Early Childhood Studies, MS 1725, Boise State University, Boise, ID 82725.

Evaluation of an instructional package using video prompting and constant time delay procedure to teach an Internet search basic skill to students with intellectual disabilities. Dimitrios Zisimopoulos, Jeff Sigafoos, and George Koutromanos, University of Patras, V. Varela Palaiopanagia, 30300 Nafpaktos, GREECE.

Using simultaneous prompting to teach restaurant words and classifications as non-target information to secondary students with moderate to severe disabilities. Bethany Smith, John W. Schuster, Belva Collins, and Harold Kleinert, 13764 Rutherglen Court, Charlotte, NC 28213.

Developing the social skills of young adult special olympics athletes. Melissa Alexander, Gail M. Dummer, Ashley Smeltzer, and Stephen J. Denton, Montclair State University, Department of Exercise Science and Physical Education, 1 Normal Ave., 4113 University Hall, Montclair, NJ 07043.

Use of a hand-held personal digital assistant (PDA) to self-prompt pedestrian travel by young adults with moderate intellectual disabilities. Linda Mechling and Nicole H. Seid, Department of Early Childhood and Special Education, University Of North Carolina Wilmington, 601 S. College Rd., Wilmington, NC 28403.

Arithmetic operations and attention in children with intellectual disabilities. Aleksandra Djuric-Zdravkovic, Mirjana Japundza-Milisavljevic, and Dragana Macesic-Petrovic, Department of Oligofrenology, University of Belgrade, 2 Visokog Stevana, Belgrade, SERBIA.

Teaching generalized reading of product warning labels to young adults with Autism using the constant time delay procedure. Maud Dogoe, Devender R. Banda, Robin H. Lock, and Rita Feinstein, Department of Counseling and Special Education, College of Education and Human Services, 353 EHS Building, Central Michigan University, Mount Pleasant, MI 48859.

Effects of no-no prompting on teaching expressive labeling of facial expressions to children with and without a pervasive developmental disorder. Justin Leaf, Misty L. Oppenheim, Wesley H. Dotson, Valerie A. Johnson, Andrea B. Courtemanche, Jan B. Sheldon, and James A. Sherman, 8799 Old Sappington Road, St. Louis, MO 63126.

Use of multisensory environments in schools for students with severe disabilities: Perceptions from schools. Jennifer Stephenson, and Mark Carter, Macquarie University Special Education Centre, Macquarie University Drive, NSW 2109, AUSTRALIA.

Address is supplied for author in boldface type.
Ganando Confianza: Research Focus Groups with Immigrant Mexican Mothers

Carolina Hausmann-Stabile and Luis H. Zayas
Washington University in St. Louis

Sandra Runes and Anna Abenis-Cintron
Lincoln Medical and Mental Health Center

Esther Calzada
New York University

Abstract: Immigrant families with children with developmental disabilities must be served using culturally sensitive approaches to service and research to maximize treatment benefits. In an effort to better understand cultural issues relevant to the provision of parenting programs for immigrant Mexican mothers of children with developmental disabilities, we conducted sustained focus groups through which we could learn more about our participants and thereby improve services. This paper reports on the challenges and lessons learned from these groups. We characterize the key lessons as (a) recruitment and retention is more than agreement to participate; (b) confidentiality is not just a word but an activity; (c) the complicated nature of language; (d) cultural norms shape the group process; (e) appreciating the value of taking time; and (f) gender issues and group interaction. Service providers and researchers who work with Mexican families may benefit from our experiences as they promote and develop programs and projects in the developmental disabilities field.

In this paper, we describe the experiences of a team of researchers conducting a project to better understand the cultural parenting constructs of immigrant Mexican mothers with preschool children in an inner-city developmental service center. The project originated from our concern with providing the best possible services for this growing group in our community-based clinic. We recognized that to simply give services without any consideration for the unique characteristics of this group of mothers and without adaptations to existing services would fail to improve service utilization rates and treatment outcomes sought. What we looked for in the literature, and did not find, were recommendations that researchers and service providers could use in recruiting, engaging, and collecting data from immigrants who reside in the shadows of our communities and whose children are developmentally disabled. The professional literature addressing practical and methodological obstacles that underlie research with ethnic and cultural minorities was helpful. This body of writing provides valuable information on culture, language, legal status, gender, and literacy (Cauce, Coronado, & Watson, 1998; Hartley, Murira, Mwangoma, Carter & Newton, 2009; Huer & Saenz, 2003), but for the relatively narrow area of Hispanics with children with disabilities, we found very little to guide us.

The primary clinical issue that propelled our project was that the immigrant Mexican families we serve seemed to need help in dealing with managing their young children’s behavior, but to assist them we needed to better understand their parenting practices. We wanted to learn about how children’s developmental disabilities are understood, and dealt with in immigrant Mexican families.
Thus, the purpose of this exploratory research project was to study parenting constructs among Hispanic mothers of young children with developmental problems, from a conceptual framework of parenting as guided by cultural childrearing values (Harkness & Super, 1996; Keller, et al., 2006; Lamm & Keller, 2007) and Hispanic mothers' value-driven behavior in different cultural contexts (Domenech Rodriguez, Davis, Rodriguez, & Bates, 2006). We sought to understand parenting practices that might predict child behavioral and pre-academic functioning in young developmentally disabled Hispanic children. Identifying and understanding these values is a critical issue in the design of preventive interventions aimed at enhancing the functioning of Hispanic children by promoting healthy parenting practices (Domenech Rodriguez, et al.; Forgatch & DeGarmo, 1999).

Since we had very little empirical knowledge to go on and since we anticipated that the parents' views would reflect a complex array of issues related to child-rearing beliefs and practices, religion, and preferences in interpersonal relations, we determined that an emic, or bottom up, approach would be best. A qualitative approach was the best option and would give us an insider's view (Morse, 2003), though focus group methodologies can be complicated by the cultural norms of the participants (De la Rosa, Rahill, Rojas, & Pinto, 2007; Stiffman, Freedenthal, Brown, Ostmann, & Hibberler, 2005). Thus, not only were we searching for knowledge about the children and families' culture for service delivery, but we had to learn about the cultural nuances that would influence the quality of our focus groups. Throughout this process, we aimed to identify and understand which cultural values are relevant to this population, and how those values may increase the engagement and retention of research participants and impact the validity of findings.

We made another important methodological decision: to hold multiple weekly focus group sessions with the same consented participants. Although a departure from the traditional focus group designs (Krueger & Casey, 2000), we considered that a sustained engagement of participants (Padgett, 2008) would help get past the hurdles of cultural distances between researchers and the mothers in our clinic. None of the research team members are immigrant Mexican persons, although most of us are Hispanics, and we recognized the large gaps that existed between us and our group of mothers in areas of education, literacy, cultural heritage, and legal status. By engaging participants over a sustained period of time, we expected the data to become richer as participants grew more comfortable with the research protocols and the personnel leading the groups. In other words, prolonged engagement helps "ameliorate reactivity and respondent bias, by dissipating the researcher's presence effect" (Padgett, p. 186). Moreover, several one-time focus groups with different participants provide good cross-sectional data in other contexts, especially when the topics elicited are not emotionally laden and where participant trust will not be a barrier to data collection and quality. Finally, because of the relatively small number of immigrant Mexican families with children with developmental disabilities and the unique nature of this family experience, holding many focus groups with the same participants was much more compelling to our project.

Focusing on a group of mostly undocumented immigrant mothers from Mexico whose children were being served in a developmental disabilities clinic in an impoverished section of New York City was a natural response to the changing Hispanic demographics of the city. We refer to our clients as Mexican while using the term Hispanic rather than Latino to refer to the large cultural and population bloc of Latin Americans for whom Spanish is the common language. This immigrant group is representative of the massive changes in neighborhood's previously reflecting a different ethnic composition. For example, New York City's Mexican population tripled in size between 1990 and 2000, resulting in ethnic shifts in traditionally Dominican and Puerto Rican areas. Immigration and high fertility rates account, in part, for this transition (Lobo, Flores, & Salvo, 2002). Further, the families came to our clinic through New York State's guarantee of health care to all children under the age of 19 through the Child Health Plus program. Children with developmental problems are thus assured access to early intervention treatments regardless of their legal status or ability to pay. To put this demo-
graphic profile into context, we have to note that Hispanic families in the U.S. are growing in numbers. As a population group, Hispanics are the largest and fastest growing ethnic minority group in the United States and those of Mexican descent or origin are the single largest group (Passel & Cohn, 2008; U.S. Census Bureau, 2007). Seventy-three percent of all children living with their unauthorized immigrant parents are U.S. citizens by birth and the number of children in mixed-status homes (i.e., unauthorized immigrant parents and citizen children) nearly doubled to 4 million between 2003 to 2008 (Fix & Zimmerman, 2001; Passel & Cohn, 2009). Spanish is the primary language or a language of legacy, and cultural traditions unite Hispanics as a pan-ethnic group in the United States. It is important to note, however, that specific ethnic groups hold on to their different cultural traditions, rooted in nationalities of origin or heritage, their migration patterns, the way in which these groups perceive their reception in the United States, the communities in which they settle, and their exposure to American mainstream culture in their countries of origin (Guarnaccia et al., 2007).

In organizing our group, we decided on a cultural homogeneity, since we knew of the significant ethnic and cultural diversity among Hispanics in general and Mexicans in particular. By selecting immigrant Mexican mothers, there would be a greater likelihood of congruity in nationality, language, gender, culture and experience. In turn, we hoped these cultural similarities would help to prevent the group dynamics that we had observed in the waiting rooms of our clinics and the larger community in which Mexican women, who were newly arrived and of unknown legal status, tended to be more demure and private when interacting with people outside their social networks as compared to other Hispanic women in our community who interact and assert themselves with fewer restraints.

In this paper, we describe the focus group project and the lessons we learned from the many challenges we encountered. Our goal is to help guide the future use of focus groups when the participants are Mexican immigrants. We categorize the challenges and describe how we dealt with them. Ultimately, we hope to encourage the incorporation of cultural factors in conducting and adapting focus groups to enhance service and research endeavors. We use the Spanish term ganando confianza (earning trust) in the title as it is emblematic of what we learned about engaging this group in research.

Method

Our study was conducted in a developmental clinic located in the Bronx, New York, between October 2008 and July 2009. After providing informed consent, twenty mothers participated in a series of ten one-hour focus groups (group size ranged from 3 to 9 participants). Focus groups met weekly, and were centered around discussing cultural childrearing values and their relevance and application in daily parent-child interactions. The focus groups followed a semi-structured protocol and were conducted in Spanish by a trained researcher. Each session was audio recorded to allow for verbatim transcription.

A purposive, convenient sample of parents was selected from the developmental clinic’s roster. The sampling was purposive since we wanted parents who were new to the clinic’s services and who had not received parenting training prior to their participation in the project. Only parents whose developmentally disabled children were engaged in weekly group activities were selected; parents without such children were excluded.

Lessons in Implementing the Focus Groups

As described above, cultural considerations played an integral part in the design of our project. The use of an emic approach that relied on focus group methodology was key to allowing participants to educate us about their culture and helped us to reduce cultural barriers in working with this population of Mexican immigrant mothers. Other methodological decisions (e.g., the use of a sustained group, the cultural homogeneity of the group participants) were similarly driven by our efforts to consider culture as a central construct in our work with Mexican participants. We believe that these efforts paid off. In other words, our first lesson was that culture must be considered in research design from the inception of a project. The remaining lessons, de-
scribed below, arose out of the process of conducting focus groups.

**Recruitment and retention is more than agreement to participate.** We were well aware of the challenge in engaging individuals who are living in the U.S. as the result of clandestine immigration processes (Cavazos-Rehg, Zayas, & Spitznagel, 2007). Any hesitation to participate in focus groups needed to be assessed within the context of the women’s experiences, such as fear of deportation combined with their isolation from social institutions. Being on the fringe of society provides some level of safety. Mistrust together with lack of information is a core component in the lives of undocumented people (Cavazos-Rehg et al.).

Although we did not inquire about the immigration status of participants, we were cognizant of the uncertainties and fears faced by undocumented immigrants and addressed these fears openly with participants during the consenting process. When we described the project to the prospective participants, we stated that the information collected would never be shared with “immigration.” We also developed strategies to ensure that the participants would not feel frightened when first approached by the research team. For this, we established partnerships with key staff at the clinic, all of whom were well known to our participants. Before we met with prospective participants, our collaborators spoke to them about the team and our project. We encouraged the mothers to speak with the clinic staff to clarify any issues they had, but especially to assure them of the legitimacy of our project. We learned later that many women did indeed contact staff seeking reassurance about the safety of their involvement. Cumulatively, these efforts helped us to gain participants’ trust and to ensure high levels of participation.

**Confidentiality is not just a word but an activity.** In working with a population that is vulnerable due to immigration status, educational background and health status, verbal assurances that confidentiality protects participants are not enough. We must actively educate research participants about confidentiality. Our approach was to reiterate that participants were both data providers and guardians of the information shared during each research encounter. This education of participants took the form of an ongoing process that went beyond the consenting stage and continued well into each focus group series. For example, during the individualized consenting process, and in later focus group sessions, we described confidentiality breaks using cultural expressions such as chisme, bochinche (gossip), and cotorreo (idle talk). When subjects described talking about the focus group experience with non-participants, we distinguished what could be shared outside the focus groups session (schedule, research nature, and goals), and what should remain confidential (the content of our conversations and the participant names).

**The complicated nature of language.** In collecting basic demographics, we asked participants for their language of preference. All of them reported that Spanish was their first language, and stated being proficient in it. None reported speaking English. However, it was only after we had conducted several sessions that some of the participants disclosed that their first languages were indigenous dialects (specifically, Mixteca and Nahuatl). First they shared this information in private with the moderator, and then spoke about it in the group setting. Some later stated that their ability to communicate in Spanish was limited, and explained that their lack of participation in the group discussions was sometimes related to their poor Spanish proficiency. Interestingly, two participants did not inform their own service providers about this language barrier, due perhaps to the stigmatization of indigenous cultures in Mexico. We learned that mothers’ initial self-reports may reflect a social desirability bias that may be less likely after a more personal relationship has been established between mother and research staff.

More generally, researchers, even those who share a broad culture with participants, can find themselves puzzled when conducting focus groups with participants of an unfamiliar sub-culture. Even within the Mexican population, there is great diversity based on participants’ place of origin (e.g., urban vs rural) and as mentioned above, language (i.e., Spanish vs indigenous). It is incumbent upon researchers and service providers to create cultural bridges to effectively communicate with
participants. In our focus groups, the moderator’s national origin became clear when speaking Spanish because of cultural expressions and accents, which elicited curiosity among the participants. We found it useful to answer questions candidly regarding nation of origin, year of immigration, and acculturation. We believe that the moderator’s disclosures fomented personalismo among the group, contributing to the building of confianza. Contrary to more conventional notions of boundaries in research and service settings, we found that our Mexican participants expected a certain level of openness from the researchers, especially because they were expected to disclose their own personal and private information.

Part of the learning experience with our population was to become familiar with the terms and cultural schemes our participants used to conceptualize constructs of interest. This was an issue that would affect the face validity of our questions, and could ultimately compromise our data integrity. In order to ensure the comprehensiveness of our questions, the moderator used as many localisms and cultural expressions as possible. We asked participants and clinical staff working with this population to provide us with an appropriate vocabulary to use in asking questions. For instance, we used the words caprichos, berrinches and pataletas for temper tantrums. When we found that certain words did not elicit answers, we role-played the behavior we were inquiring about and asked the participants to describe how they would name it. Ultimately, our experience in running the focus groups underscored the notion of language as a complex tool of communication and challenged our assumption that speaking Spanish, in and of itself, was sufficient in eliminating all communication barriers with this population of Mexican immigrants.

Cultural norms shape the group process. The focus group setting allowed us to take advantage of the norms of sociability common in the cultures of Hispanics, namely the cultural values of personalismo and confianza. Both personalismo (personalism) and confianza (trust, confidence in) are relevant to the interpersonal commerce between individuals and are essential in reducing hierarchical or power dynamics. After all, the advantage of focus groups is their sensitivity to patterns of interpersonal and group dynamics (Kamberelis & Dimitriadis, 2005). Personalismo implies the creation and maintenance of warm, friendly and respectful interactions (Bachrach & Mawr, 1958). Confianza grows as a result of a reciprocity born of the repetition of positive personal interactions in which genuine respeto (respect) is conveyed. Through confianza, individuals feel a mutuality within which they extend favorable treatment to one other. Confianza provides interactions with a “special quality of openness” (Lewis-Fernandez & Kleinman, 1994, p. 69), thus exceeding and, at the same time, encompassing familiarity, confidence, and trust. Respeto promotes deference towards others and aligns with the Hispanic cultural emphasis on lineality and power differentials (Bracero, 1998). For example, the moderator always used the formal usted rather than the informal tu that if used too early in an encounter can be seen as indicative of disrespect.

Given that confianza develops over time, and in spite of our determined efforts to be guided by these cultural scripts to help participants feel comfortable in the first focus group sessions, participants remained mostly silent during the initial phase of the project. We addressed this challenge through our persistent efforts to embody personalismo and earn confianza by building a positive relationship between the participants and moderators. We began to call participants in advance of meetings to remind them of the coming focus group sessions, socializing lightly on the telephone call. We engaged in social conventions and mild banter as the mothers arrived at the clinic, and sent personalized Spanish greeting cards on holidays and other special occasions. When taking to the mothers in the waiting room, we spoke about topics that could highlight common interests, like Spanish recipies, music, and crafts. This paid off in the form of enhancing the mothers’ own investment in the groups.

As time went on, we also asked for recommendations for how we could build confianza with participants. The mothers requested that the moderator be “patient to explain” (tener paciencia para explicar) and “show a willingness to learn” (parecer interesada). They were concerned with how to parecer buena (look good,
compliant) to the moderator. At the end of one focus group series, several participants stated that letting the moderator know that they could not understand her questions would have made the moderator look “dumb” (tonta) which would have implied disrespect. By remaining silent, they protected the moderator from feeling as if she could not communicate with them. Throughout, this process of acclimating to one another was imbued with the importance of dignidad (dignity) and respeto, both of which reduce the potential loss of face and allowed mothers to maintain a dignified posture in the face of this uncertain experience that they had embarked on with us.

Appreciating the value of taking time. As noted above, time was an important factor in helping to build the positive rapport that had eluded the researcher-subject relationship during the first weeks of focus group sessions. This was only possible because our research design allowed for plenty of time to generate a positive environment favoring personalismo and the building of confianza between researchers and participants. In addition, we found it necessary to follow the participants’ pace within each group. Oftentimes, they were slow to respond to our questions, which seemed to reflect several factors including a lack of understanding of some questions, a desire to be thoughtful in their response, and a response style that was indirect. To address a potential lack of understanding, questions had to be reworded multiple times, until we were able to find a path that encouraged responses. This process was frustrating at times because participants became silent and their attention drifted occasionally.

In addition, questions that were too open ended failed to elicit answers. Instead, presenting “scenarios” as a way to illustrate our queries elicited more discussion. Likewise, we learned that our participants preferred to respond to questions through stories. As part of a culturally based deferential approach to communication that tries to avoid any indication of confrontation, disrespect, or disagreement, consistent with the emphasis on personalismo and respeto, many of our participants spoke in a circular, non-direct manner. This meant that delivering their message depended on descriptions of multiple subtopics that were integrated in a meaningful manner at the end of the story. As participants used personal stories to illustrate their points, we found it necessary to adjust our timeline and reduce the number of questions posed in each session.

Gender definitions affect group interaction. When conducting focus groups with Mexican women, we took into consideration the construct of marianismo. The term marianismo refers to gender roles expectations in the Hispanic culture that women’s roles are deeply influenced by the qualities ascribed to the Virgin Mary (Virgen María). These qualities include self-sacrifice, chastity and virtue, modesty, and obedience (Ramos-McKay, Comas-Díaz, & Rivera, 1988). This translates into traditional socialization practices, in which women are expected to be passive, demure, and hyper-responsible for family obligations, unity and harmony (Gil & Vasquez, 1997). One quality of marianismo that we may have observed in our groups was the traditional Mexican norm, controlarse (self-control). Women are expected to ensure harmony in the context of interpersonal interactions by dissociating from any negative emotions (Bracero, 1998), and expressing disagreement in subtle ways. When participants in our groups opposed something presented by the moderator, they either did not express their disagreement, or expressed it through the use of non-verbal cues. Only because our design allowed us the time needed to learn some of the participants’ idiosyncrasies, were we able to recognize and address them. For instance, after several groups, when personal relationships had been formed, the moderator felt free to make direct observations such as, “You are making a funny face; please tell me what you are thinking!” These interactions generated a personal, relaxing environment for the participants and thereby improved the quality of our data.

Conclusion

In setting out to conduct focus groups with immigrant Mexican mothers of young children with developmental problems to learn more about their parenting and cultural values, we learned several valuable lessons related to the design and process of the focus groups themselves. On several levels, we
found it necessary to make culturally informed adaptations given barriers related to language, legal status and cultural beliefs, norms and scripts. Specifically, we paid close attention to the Hispanic cultural constructs relevant to interpersonal and socialization practices, such as personalismo, confianza, and respeto, as well as gender roles, such as marianismo. We were able to develop a research protocol that provided ample opportunities to interact with the participants generating confianza with and among participants. The team found that being cognizant of the uncertainties and fears faced by undocumented immigrants and stressing the confidential and voluntary nature of their participation eased their involvement into the project. Actively approaching the participants in Spanish, being open to new ways of communicating in Spanish that were most congruent with the Mexican culture, helped to create an environment in which participants recognized our interest in learning from them. Finally, by coupling effective research methods with cultural-centered strategies, we sought to maintain fidelity to the focus group’s core components while enhancing the validity of our findings. Given the lack of empirical data to support our clinical impressions, we are unsure about the generalizability of our findings to other Mexicans. Still, we encourage the field to acknowledge culture as a central construct in all phases of research and services endeavors and advocate for the use of an emic approach to learn directly from the Mexican families we serve.

References


Received: 23 July 2009
Initial Acceptance: 20 September 2009
Final Acceptance: 18 November 2009

---

I Can Identify Saturn but I Can’t Brush My Teeth: What Happens When the Curricular Focus for Students with Severe Disabilities Shifts

Kevin M. Ayres
The University of Georgia

K. Alisa Lowrey
Louisiana State University Health Science Center

Karen H. Douglas
The University of Georgia

Courtney Sievers
Gwinnet County Public Schools

Abstract: Determining the most effective curricula for students with severe disabilities requires increased attention as legislation and curricular changes are being made in the field of special education. This article a) reviews the legislation mandates from the 2004 Individuals with Disabilities Education Improvement Act (IDEIA) and the 2001 No Child Left Behind Act (NCLB), b) discusses evidence-based practices for a standards-based curriculum and functional curriculum, and c) examines longitudinal outcomes for students with severe disabilities. The research suggests that students working on functional skills provided through a meaningful curriculum leads to a more independent life. Recommendations for future research and discussion are also presented.

Developing curriculum for students with severe disabilities has been a topic that has been widely addressed since the inception of the field of special education. ‘What’ and ‘how’ to teach are topics that are addressed regularly in the literature (Dymond & Orelove, 2001). Over time, those topics have cycled through selecting from the broad categories of developmentally appropriate curricula, functional curricula, and currently, general education standards-based curricula (Bricker, Siebert, & Casuso, 1980; Brown et al., 1979; Hitchcock, Meyer, Rose, & Jackson, 2002; Wehmeyer, Lattin, & Agran, 2001). Currently, a focus on functional curriculum for students with severe disabilities is being reexamined and to a large extent altered if not abandoned in favor of a more general education or standards-based curriculum. Standards-based curriculum has an outcome of grade-level achievement that may or may not lead to more independent functioning. Functional curriculum has outcomes of improving a student’s independent functioning in their current and future environments (Snell & Brown, 2006; Westling & Fox, 2004). These two curricula approaches are not and should not be exclusive, however, current prioritizing of standards-based curriculum seems to set them up as such.

Evidence presented in this article suggests that students with severe disabilities can learn objectives related to grade-level standards. The question of whether or not students can learn standards is not the question we seek to answer—we know they can. The imperative question to be answered is ‘at what cost do they learn these standards?’ Will these skills help the students get a job? Choose where to live? Actively participate in their community? All educators should have high expectations for their students and seek to challenge their students at appropriate levels, but learning fragments of higher level academic skills should not be achieved at the cost of learning how to function independently in society. One of the authors, while seated in an IEP meeting as a consultant witnessed a frustrated parent of a child with severe intellectual dis-
abilities say “My son can identify Saturn but he still can’t request a snack or even wipe his ass.” This is the quintessential point that begs discussion by the entire field of severe disabilities. At what point does working toward fragmented, watered down academic standards become less important than working toward meaningful individualized curricula directly tied to increasing independence in identified current and future environments. It is our position to continue to increase real outcomes for students by focusing on students as individuals with specific preferences and needs resulting in meaningful curriculum for each and every student. The purpose of this paper is to examine the evidence on standards-based curricula and to examine the evidence-base supporting the achievement of functional skills for students with severe disabilities. We will also review current legislation as it applies to curricula development. By comparing these two bodies of literature, we will demonstrate the need to maintain a functional curricular approach as the priority when developing curricula for individuals with severe disabilities.

**Legislation**

When determining how to develop meaningful outcomes for students with severe disabilities, the field of special education is informed by several different sources. Mandates from legislation, evidence-based practices, and information on longitudinal outcomes for students should all impact the decisions we make for students with severe disabilities. This leads to our primary determinates in developing meaningful curricula for students with severe disabilities: combining what we are required to do, what we know works educationally, and what we know is a priority for students’ lives after school.

**IDEA**

Legislation mandates what we must do to develop meaningful outcomes from the educational programs for students with disabilities. First, the Individuals with Disabilities Education Improvement Act of 2004 continues to emphasize the connection between meaningful, individualized curriculum for students with disabilities and post-school outcomes. IDEIA requires that students be given access to general education curriculum to the maximum extent appropriate. Access to general education is provided “in order to (i) meet developmental goals and, to the maximum extent possible, the challenging expectations that have been established for all children; and (ii) be prepared to lead productive and independent adult lives, to the maximum extent possible” (118, Stat. 2651). Lowrey, Drasgow, Renzaglia, and Chezan (2007) interpret this statement to mean that ‘appropriateness’ and ‘meaningfulness’ in a child’s educational program can be measured by whether or not the educational gains of the student actually prepare that student to lead an independent and productive adult life to the maximum extent possible. IDEIA requires that educational targets be based on what students can currently do, both academically and functionally, by including a statement describing students Present Levels of Academic Achievement and Functional Performance (PLAAFP) (Yell & Drasgow, 2007). According to Yell and Drasgow, these PLAAFP statements should directly link to Individualized Education Program (IEP) goals and objectives to create a cycle of meaningful outcomes-based targets, appropriate teaching, and progress monitoring. IDEIA’s focus on transition increases this connection. In addition to meaningful educational goals, meaningful transition plans are required. Transition plans are developed by “a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability” (118, Stat. 2658). The plans prepare students for post-school education, employment, independent living, and community involvement by assessing their needs, interests, preferences, and strengths in order to create objectives to help students’ achieve their goals. Through transition plans, PLAAFP statements, and individualization, IDEIA provides a direct connection between a student’s educational targets and a student’s independence in their adult life following school. The No Child Left Behind Act of 2001 may hinder this direct connection.

**NCLB**

Following the passage of the No Child Left Behind Act of 2001, state education agencies
(SEA) began to interpret and react to stipulations that all students’ (including those with severe cognitive disabilities) educational program be tied to grade level standards (Kohl, McLaughlin, & Nagle, 2006). The No Child Left Behind Act of 2001 requires that students with severe cognitive disabilities be part of the systemic accountability measures of NCLB as well as involving them in the general education curriculum. “All students with disabilities should have access to, participate in, and make progress in, the general curriculum. Thus, all students with disabilities must be included in the measurement of AYP toward meeting the State’s standards” (p. 68698). Regardless of assessment practices, this process begs the question of whether or not the curriculum for students with severe cognitive disabilities should be focused on the same topics and skills as all other students. NCLB does not require curriculum development for individuals with severe cognitive disabilities (or any disability) begin with and be limited to the standards, only that it be linked to the standards in order for students to participate and progress. Thus, the impetus for where one begins and expands educational curriculum development for students with disabilities is better informed by the provisions of IDEIA discussed above.

Although much can be made of the potential conflict between the seemingly separate aims of these two laws, we propose that indeed, students with severe disabilities can be included in generalized systemic assessment and still have individualized curriculum that leads to meaningful adult outcomes. The key component in addressing this curriculum development is the beginning point—identifying individualized needs that increase independence in the natural environment rather than looking directly at grade level academic outcomes and working backward. Because functional skills are not identified as priority skills under NCLB, they are not assessed toward AYP. Therefore, they may potentially be moved to lower instructional priority even if a teacher acknowledges the need for instruction in a functional area. We are not arguing that students with severe disabilities cannot learn some of these grade level standards in the general education curriculum. Evidence presented below suggests they can. Our concern is on whether or not the learning of grade level standards increases independence in post-school environments thereby increasing an individual’s quality of life. In a public statement at the Council for Exceptional Children national convention in Louisville, KY, 2007, a very prominent and well respected researcher in our field who was in the audience of the presentation (McDonnell, Hunt, Kleinert, & Renzaglia, 2007), publically argued that this shift is a moral and ethical shift. But on whose ethical grounds should this change be based? Unless a student’s curriculum is developed using outcomes that are essential for post-school success, we argue that many of the general education standards may not be beneficial for increasing a student’s quality of life as an adult. This at least follows logic and is not an ambiguous values based decision.

Findings from empirically supported practice give us much evidence to understand the pedagogy to use when teaching students with severe disabilities. In addition, that same body of research has given us many insights into skills that students can and do achieve when good pedagogy is implemented with these students. A closer examination of that literature helps us discern educational programs that are meaningful and those that are not.

Empirically Supported Practice

There are varied ways to parse research about learning. One of the simplest approaches is to separate basic research from applied research. One can do this by discriminating between those experiments that seek to identify socially important interventions and those that are pursued for the pure science of seeing what is possible (Baer, Wolf, & Risley, 1968). Both have a valid and important place in understanding how individuals learn and often, basic research is a stepping stone to applied research. By looking at both types of research, we can potentially gain better understanding of where we should head as a field. We have to be cautious though in our interpretation of this research and be sure that our decisions for our field are based on the best empiricism of applied research and how we can make differences in the lives of individuals with disabilities and their families.
Standards-based Focus

Currently, the field of special education has seen several experimental studies that seek to understand the boundaries of what is possible in terms of modern instructional technology and the potential for learners with cognitive impairments (e.g., Mechling, Gast, & Krupa, 2007; Stock, Davies, Davies, & Wehmeyer, 2006; Davies, Stock, & Wehmeyer, 2001). Multiple literature reviews cite studies that demonstrate students with severe cognitive disabilities can learn academic skills in reading (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006), math (Browder, Spooner, Ahlgrim-Delzell, Harris, & Wakeman, 2008), and science (Courtade, Spooner, & Browder, 2007). Currently, much of the research has that focused on teaching grade-level academic standards to students with severe cognitive disabilities has shown some impressive results. Jimenez, Browder, and Courtade (2008) taught three high school students with moderate intellectual disabilities how to solve an algebraic equation. But, our questions remain: Do learning these skills help individuals with severe disabilities become more independent and successful in their lives? Are teaching these standards an efficient use of instruction time? In Jimenez et al., it took one student nine sessions, another student 17 sessions, and the third student required multiple modifications throughout the intervention to achieve eight out of nine by the 31st lesson (no information was provided about how many days or weeks it required to schedule these sessions). It is also important to consider these results in the larger context of empirically supported practice. The authors rightly identify that their results need social validation. Just because students are accessing the general education standards and participating to an extent in general education classrooms, does not mean students are learning (Wehmeyer, 2006). Cihak and Foust (2008) compared using a number line and touch point strategies to teach the acquisition of solving single-digit addition problems to three elementary students with autism with IQ equivalence scores between 40 and 50. Students reached the criteria with touch points more quickly after 10 to 16 sessions, but generalization across materials or environments was not assessed. The achievement of general education standards may be the most appropriate target for some students with severe disabilities, however, one cannot know that for certain without assessing each student’s individualized needs in order to create a meaningful individualized curriculum that addresses those needs not only in the present, but in the long-term.

Functional Focus

As we shift our focus to the larger body of literature on curriculum interventions related to functional life schools, it is important to recognize that to completely summarize this literature base would require volumes. Therefore, the summary that follows will attempt to highlight only a portion of studies focused on functional or meaningful skills. Certainly, general education standards can lead students to functional outcomes. It is important to determine however, before they are chosen as a target, if indeed the outcome projected (e.g. learning the planets) is, in fact, a functional outcome. One litmus test for determining functionality of a skill that Lou Brown popularized was to ask whether someone else would have to perform a task for a student if the student themselves could not do it (Brown et al., 1979). To ultimately determine the utility of a particular skill he suggested that we ask whether or not “students could function as adults if they did not acquire the skill?” (Brown, Nietupski, & Hamre-Nietupski, 1976, p. 9). Considering the range of environments where students live and the need to provide students options so that they can make choices for themselves, the broad category of functional curriculum encompasses innumerable skills that are important for community participation. Researchers have identified a range of instructional techniques to teach these skills. Without summarizing all of the instructional techniques, and because our focus is on curriculum, it seems most appropriate to highlight some of the functional skill areas where researchers have successfully taught individuals with severe cognitive impairments to participate more independently in their environments.
Consumer skills. Beginning with shopping or consumer skills, a range of interventions have been used to teach skills such as making payments with cash (Ayres & Langone, 2002; Ayres, Langone, Boon, & Norman, 2006), making payments with debit cards (Mechling, Gast, & Barthold, 2003), locating items (Hutcherson, Langone, Ayres, & Clees, 2004; Langone, Shade, Clees, & Day, 1999; Mechling, Gast, & Langone, 2002; Mechling & Gast, 2005; Mechling, 2004), and as well as the entire process of finding an item and then paying for it (Alacantara, 1994; Bates, Cuvo, Miner, & Korbek, 2001; Haring, Breen, Weiner, Kennedy, & Bedner, 1995; Haring, Kennedy, Adams & Pitts-Conway, 1987; Wissick, Lloyd, & Kinzie, 1992). Beyond shopping, others have successfully taught other money related skills including ordering and paying in restaurants (Donnell & Ferguson, 1988; Mechling & Cronin, 2006; Mechling, Pridgen & Cronin, 2005), using a pay phone (Collins, Stinson & Land, 1993), using a vending machine (Browder, Snell, & Wildonger, 1988), cashing a check (Branhom, Collins, Schuster, & Kleinert, 1999), and using an ATM card (Alberto, Cihak, & Gama, 2005).

Other community skills. Beyond being a consumer, there are several other activities in the community in which individuals may desire to participate. Researchers have documented successful interventions for teaching a variety of office and vocational skills (Branham et al., 1999; Cihak, Alberto, Kessler, & Taber, 2004; Hillier, Fish, Cilcott, & Beversdorf, 2007; Mechling & Ortega-Hurdleon, 2007), and street crossing skills (Branham et al.; Collins et al., 1993).

Domestic and self-help skills. If an individual is going to live independently or achieve the criterion of ultimate functioning, they must know how to take care of themselves in their home. Researchers have demonstrated effective interventions for teaching multiple domestic skills including putting away groceries (Ayres & Langone, 2007; Cannella-Malone et al., 2006), preparing food (Fiscus, Schuster, Morse, & Collins, 2002; Graves, Collins, Schuster, & Kleinert, 2005; Griffen, Wolery, & Schuster, 1992; Johnson & Cuvo, 1981; Jones & Collins, 1997; Lasater & Brady, 1995; Martin, Rusch, James, Decker, & Trtct, 1982; Norman, Collins, & Schuster, 2001; Rehfeldt, Dahman, Young, Cherry, & Davis, 2003; Robinson-Wilson, 1977; Schleien, Ash, Kiernan, & Wehman, 1981; Shipley, Benamou, Lutzker, & Taubman, 2002; Van Laarhoven & Van Laarhoven-Myers, 2006), laundry skills (Bates et al., 2001; Lasater & Brady, 1995; Morrow & Bates, 1987; Neef, Lensbower, Hockersmith, DePalma, & Gray, 1990), dressing (Norman et al.; Hughes, Schuster, & Nelson, 1993), and hygiene (Stokes, Cameron, Dorsey, & Fleming, 2004; Parrot, Schuster, Collins, & Gassaway, 2000; Snell, Lewis, & Houghton, 1989).

Functional skill summary. While the assembly of studies above is not an exhaustive accounting of empirically based interventions for teaching functional skills, it should provide ample illustration of the extant literature on teaching functional skills to students with severe developmental disabilities. These are socially significant changes if the student is able to complete the task for themselves and no longer needs to depend on others. Aside from sharing an emphasis on teaching students skills for independence, the studies above share a common element: the interventions are not “instant,” they take an investment in time from the teacher as well as the student. According to IDEIA (2004) students must exit special education services by the age of 21. Services provided through IDEIA provide the most comprehensive investment of time and resources in a student with disabilities educational achievement. A student has only a finite amount of time in school to learn the critical skills that they will need to achieve the criterion of ultimate functioning (approximately 3,780 hours if attending school from age 3–21, 180 days per year, 7 hours per day). Whether the time is spent addressing academic, social or life skills, the decision needs to be individualized to the learner to reap the maximum return on the time invested. Time spent addressing the general curriculum (e.g., the solar system, Shakespeare) without prioritizing the focus to meaningful, individualized outcomes is time lost in gaining meaningful outcomes that directly improve a student’s adult functioning. There is no reasonable way to integrate Chaucer or volcanoes into a community based instructional lesson related to paying for a meal at a restaurant. Addressing general education standards simply because they are the general education standard does...
not end in meaningful achievement towards adult outcomes for most students with severe disabilities. This is a simple zero sum formula that threatens to impinge on a student’s opportunity to learn valuable life skills.

Skills in context. According to the National Transition Longitudinal Survey (Cameto, Levine, & Wagner, 2004), almost half of the students with intellectual disabilities, 57% of those with autism and 58% of those with multiple disabilities had goals related to maximizing independence. From this, one may infer that achieving the criterion of ultimate functioning (Brown et al., 1976) was important to the students and their families. Preparing students for the future requires helping them to develop the skill sets that will be needed in their future environments. Learning generalizable work skills, how to balance a checkbook, prepare a meal, and navigate public transit, are integral to meeting the criterion of ultimate functioning depending on a student’s future environments. Wagner, Newman, Cameto, Gazza, and Levine (2005) reported from NTLS data that students with intellectual disabilities participate in work and work preparation activities in preparation for post-high school transition at rates lower than other disability groups and yet lack many of the skills required for independence. While one may argue that learning individual letters, differentiating types of rocks, and the order of the planets may be identified as important for some students, the reality is that many of these activities are not directly linked to increasing independence in the adult environment. It is the lack of integration or the lack of connection between the general education curriculum and the meaningful life skills that so many students with severe disabilities need that creates the problem. The standards themselves are not harmful, the lack of focus on individualized outcomes relative to meaningful individualized needs that is the problem. The data clearly show that we possess the instructional technology to teach these skills, yet we are moving toward teaching other skills that do not have as direct a link to independence. Is this the path special education should take and if so, at what cost?

Longitudinal Outcomes

The move towards standardized general education curriculum for all students may, on the surface, seem benign. However there is a lack of empiricism on long term (post school) outcomes for students with severe cognitive disabilities whose curriculum has been focused on learning academic tasks that do not relate directly to improving post school outcomes. Absent that empiricism, there is not even a cogent, logical argument for prioritizing curriculum around skills and information that will not help students achieve greater independence. If a wholesale adoption of modified general education standards becomes the gold standard for program planning for all students, many parents of students with severe disabilities (as well as their children) will be left with out Free Appropriate Public Education. Parents have reported less satisfaction with their child’s involvement in an inclusive setting and participating in the alternate assessment process as their child got older (Kasari, Freeman, Bauminger, & Alkin, 2004, Roach, 2006). Addressing 6–10 general education standards a year does not equal a functional educational program—especially if those standards are chosen outside of the context of individual student needs. Students that experience that type of educational programming will not have access to a curriculum that meets their individual needs; therefore parents will have to rely on their own ability and outside resources to provide students with the education they need and deserve.

Recommendations

We propose developing a meaningful educational curriculum that is individualized and inclusive of each student’s needs (both academic and daily functioning) and interests. The research above demonstrates students with severe disabilities can make progress in all areas. Attainment of meaningful skills linked to current and future environments directly impact an individual’s ability to function independently in their future housing, work, community participation, and relationships. Perceptions of mainstream society are also affected positively when students with severe disabilities
learn to operate independently in the mainstream world. This type of role valorization could lead to enhanced community opportunity. While students with severe cognitive disabilities can make progress in grade level and those standards can be taught using empirically valid teaching procedures, if those standards have not been targeted because they directly meet an established individual need, those skills may not be retained and used in everyday life. Students with severe cognitive disabilities need to learn skills that will increase their job opportunities, independent living opportunities, social integration and community independence.

Special education that abandons individualized curriculum and moves toward a single curriculum (i.e. grade level competencies) that may then be watered down to mere fragmented splinter skills, neglects a student’s right to an appropriate education. While students without disabilities are being prepared to attend college, technical school, or enter the work force, students with disabilities are mandated to attend to that same curriculum that is not individually designed. These students are not being prepared for independence in the same way that students without disabilities are. Rather than looking at generalized academic standards which are in part based on the knowledge that is required for post-secondary education, curriculum designed for students with disabilities should more closely reflect the ecology of the individual environments in which these students live and will live. This would mean comprehensive local level plans to identify those skills that would provide a student with the greatest opportunities to access the least restrictive services (e.g., competitive or supported employment, independent or group living, community leisure activities). A continual focus on teaching students a curriculum that is not meaningful and helpful in their lives, such as teaching Romeo and Juliet with no pre-assessed identified individual targets, is about as helpful and useful as teaching a student to pay for tickets at a movie theatre when their town does not have a theatre.

In conclusion, IDEIA (2004) provides the right for every student to achieve educational progress in a curriculum that is specifically designed to meet their unique learning needs (2004). Progress is not the acquisition of useless knowledge and/or skills; rather educational progress is the acquisition of knowledge and skills toward the eventual outcome of mastery. We must assess our students’ progress so that we know they are learning their prioritized outcomes; so their parents can be assured that the student is getting what they have a legal right to, and so the student’s educational program can continually be adjusted to meet that student’s needs as they learn. A universal grade level standard does not support this definition of progress. In order to develop meaningful curriculum that supports educational progress, we must begin with a thorough assessment of individualized student needs. Once student needs are determined, those needs must be prioritized so that each student has his/her most pressing needs addressed. At this point in curriculum development, we should then review the standards for appropriate meaningful matches as well as determining what functional daily living skills are needed. By developing curricula targets in this way, we can know that students are making progress towards meaningful outcomes. If we begin with the standards, we may miss important priorities in other areas (Dymond & O rele, 2001; McDonnell et al., 2007). When developing curriculum, we must focus on localized rather than state or national goals if we expect these students to live as independently as possible in that locale (Brown et al., 1979). Systematically, we need to hold each of these students, as well as their teachers, to high educational standards. This was the intent of NCLB 2001. However, high standards should not be interpreted directly as general education standards. Standards that are benchmarked to academic, grade level goals may not be appropriate for all students. As our technology of teaching has shown us, we have learned a tremendous amount about how to educate students with the most severe learning problems. If we aim this technology toward achieving independence and integration through targeted meaningful curriculum, we advance one step closer to helping realize a society that...
values individuals for what they can do rather than what they can’t.

**Conclusion**

Throughout the course of this paper we stand by the position that we, as special educators, should continue to increase real outcomes for students by focusing on students as individuals with specific preferences and needs resulting in a meaningful curricular development for each and every student. The purpose of this article was to examine the evidence on standards-based curricula and to examine the evidence-based supporting the achievement of functional skills for students with severe disabilities. We also reviewed current legislation as it applied to curricula development. By comparing these two bodies of literature, we demonstrated the need to maintain a functional curricular approach as the priority when developing curricula for individuals with severe disabilities. We posit that it is only through this individualized approach that students with severe disabilities will make progress towards meaningful targets that will positively affect their current and future independence in their localized environments.

**References**


Cihak, D. F., Alberto, P. A., Kessler, K. B., & Taber,


Received: 25 June 2009
Initial Acceptance: 19 August 2009
Final Acceptance: 30 October 2009
Addition of Functional Content during Core Content Instruction with Students with Moderate Disabilities

Belva C. Collins and Karen L. Hager
University of Kentucky

Carey Creech Galloway
Clark County Schools

Abstract: The purpose of this investigation was to add functional content during core content instruction of language arts, science, and math. The investigation involved three middle school students with moderate disabilities who participated in the state’s alternate assessment. During instruction using a constant time delay procedure to teach required grade level core content, the special education instructor added functional content as follows: (a) language arts–information found in the news added to grade level sight word vocabulary, (b) science–cooking skills or appropriate dress for weather conditions added to the properties of elements in the periodic table, and (c) math–computation of sales tax for items appearing in advertisements added to order of operations. The results showed that students could learn, maintain, and generalize both types of content presented within the same lesson.

The No Child Left Behind Act (NCLB) and the Individuals with Disabilities Education Act (IDEA) both mandate that all students, including those with moderate-severe disabilities (MSD) receive access to the general curriculum. Among researchers and practitioners in the field of special education, however, there is not an agreed upon definition of access to the general curriculum (Dymond, Renzaglia, Gilson, & Slagor, 2007). While questions remain regarding what exactly constitutes the general curriculum as well as what access means, often the discussion focuses on learning standards and the academic components of the general curriculum (Dymond et al.). This may be due, at least in part, to NCLB accountability measures that require states to report academic achievement for all students in the specific content areas of reading/language arts, math, and science. Students who are unable, even with appropriate accommodations, to participate in these tests are also assessed on these academic content areas but do so through participating in alternate assessments (Browder & Cooper-Duffy, 2003). Many students with MSD are eligible to participate in these alternate assessments that may be aligned with alternate academic achievement standards but still based on grade level achievement standards.

A particular challenge for teachers of students with MSD is providing instruction on the grade level general curriculum as well as addressing other needs the students may have that are not addressed in the general curriculum. IDEA requires that IEP goals address both academic and functional needs. While students with MSD can and should have access to content presented in general education settings, they often require substantially more time to reach criterion on skills targeted for instruction than is allowed in the unit approach used in most general education settings (Helmstetter, Curry, Brennan, & Sampson-Saul, 1998; Logan & Malone, 1998; McDonnell, Thorson, & McQuivey, 2000; McDonnell, Thorson, & McQuivey, 1998). Thus, special education teachers may find themselves in the position of needing to provide additional direct instruction on core content in addition to what is received in the general education setting if students are to master the content. Given the finite amount of instructional time available, two critical issues must be acknowledged and addressed. One is to...
provide instruction as effectively and efficiently as possible, and the other is to establish instructional priorities.

Regarding the first issue, effective and efficient instructional procedures, a large body of research has provided evidence that systematic instruction using response prompting procedures is an effective strategy to teach skills to students with MSD and other special needs (Collins, 2007; Wolery & Schuster, 1997). For example, the time delay procedure is an evidence-based response prompting procedure that has a long history of being effective in teaching both discrete skills and chained tasks to students with MSD across settings (Collins; Schuster et al., 1998; Wolery, Ault, & Doyle, 1992). The time delay procedure systematically increases the delay interval that students have to perform a correct response prior to being prompted, thus transferring stimulus control from the prompt to the natural stimulus. The progressive time delay (PTD) procedure increases the delay interval by small increments (e.g., 0 s, 1 s, 2 s, 3 s) while the constant time delay (CTD) procedure begins with a 0 s delay interval and then increases the delay to a set number of seconds (e.g., 3 s) for all remaining instructional trials. This procedure has been implemented by classroom teachers with a high degree of fidelity (Collins & Schuster, 2001).

Research-based strategies are thus available to increase the effectiveness of instruction, and there is also evidence to support teaching core content and functional content together, which addresses some of the issues of instructional priorities. IDEA requires that instructional priorities be established on an individual basis for students with disabilities, while also requiring that both academic and functional educational needs be targeted. Teaching core content and functional content together is one strategy to address these needs. While grade level core content is targeted, functional content based on individual needs is addressed within the same instructional setting.

In an investigation with students with moderate disabilities across age levels, Collins, Evans, Galloway, Karl, and Miller (2007) provided evidence that the students could acquire both functional and core content sight words when these were paired across settings and instructional formats. While their investigation targeted both functional and core content for instruction, other investigations with students with MSD have added functional information as nontargeted information, hoping that students would acquire at least some of the extra information to which they were exposed during systematic instruction. For example, Falkenstine, Collins, Schuster, and Kleinert (2009) added the nontargeted information of how to set a wristwatch during instruction on telling time and how to look up a word in the dictionary during instruction on identifying arts and humanities sight words. Instruction took place in a small group format with the nontargeted information presented as instructive feedback during the consequence portion of each instructional trial. Each of the students with MSD who participated in the investigation was able to acquire the targeted skills as well as much of the nontargeted information presented during the instructional trials. In addition, they acquired much of the targeted and nontargeted information presented to other students in the group through observational learning.

It is clear that a more efficient use of instructional time is to focus on more than one skill during instruction. The drawbacks to relying on presentation of skills as nontargeted information are that instructors do not collect formative data on this information in order to assess learning, they do not set specific criteria for mastery, and they do not make instructional modifications if students fail to acquire the extra information. Therefore, the best way to ensure that students master both core content and functional content is to target both for direct instruction and to collect formative data on student progress on both across instructional sessions.

In the present investigation, a special education teacher (the third author) and a paraprofessional implemented a CTD procedure to teach both functional and core content to middle school students with moderate disabilities who participated in the state alternate assessment. While the selected core content was required, the addition of related functional content provided a framework for presenting core content in a meaningful context. The research literature has shown that meaningful skills are likely to maintain and to gen-
eralize (Wolery et al., 1992) since meaningful skills are more likely to be needed in natural environments. In addition, instruction on content that is meaningful also may be more reinforcing to students, thus increasing appropriate behavior during instruction (Horner, Albin, Todd, & Sprague, 2006). Specifically, the research questions were (a) Will middle school students with moderate disabilities acquire both core content and a functional application through direct instruction? and (b) Will the students generalize that content across probe trials using novel materials and activities?

Method

Participants

Students. Three middle school students identified with functional mental disabilities (i.e., moderate to severe disabilities) participated in the investigation. The special education teacher selected these students because they would be participating in the state’s alternate assessment during the school year and, thus, would need alternate portfolio entries documenting the acquisition of required grade level core content in language arts, math, and science. In addition, she selected the students because they had a dependable record of school attendance and she anticipated that they had the ability to master targeted content within the 7-month timeframe for the investigation. The timeframe coincided with the beginning of the academic school year and the final date for submission of the state’s alternate assessment portfolios. Each of the students selected to participate had good receptive communication skills for following directions whether or not they had adequate expressive verbal communication for responding. In addition, all had a history with systematic direct instruction using response-prompting procedures, although this was not a prerequisite for inclusion in the investigation.

The middle school participants were Jason, Morgan, and Rena. Jason was a 14-yr old male with a reported IQ score of 55 on the WISC III (Wechsler, 1997) and a score of 56 on the Adaptive Behavior Assessment System (Harrison & Oakland, 2003). His IEP objectives included reading survival words, food and recipe words, and core content vocabulary; answering comprehension questions; typing documents and personal information; using touch math for addition, subtraction, and multiplication; maintaining the ability to count coins and use a next dollar strategy; and performing selected vocational tasks. Jason spent approximately 50–60% of his day in general education classes (e.g., science, social studies).

Morgan was a 14-yr old male with autism and a reported IQ score of 47 on the Universal Nonverbal Test of Intelligence (Bracken & McCallum, 1998). His IEP objectives included using a calculator to work with money, using touch math to count coins, following picture recipes, reading survival words, and maintaining the ability to use a schedule and follow 2- to 3-step directions. Morgan spent approximately 40% of his day in general education classes.

Rena was a 15-yr old female with Down syndrome and an IQ score of 41 on the Universal Nonverbal Test of Intelligence (Bracken & McCallum, 1998). Her IEP objectives included washing her hands, feet, and face; using a picture list to locate grocery items; following a picture recipe; using touch math to count coins; checking her schedule and making choices; reading food and recipe words, survival words, personal information, and core content; and identifying personal information. Rena spent approximately 40% of her day in general education classes.

Staff. A special education teacher conducted all instructional sessions in a special education resource room until she left for maternity leave at the end of the fifth month of the investigation. At that time, an experienced paraprofessional in the resource room who had participated in a previous study with the teacher (Collins et al., 2007) began conducting all instructional sessions. The special education teacher returned to school in time to conduct the final sessions with two of the students. The instructors also graphed and monitored all instructional data. The special education teacher had three years of teaching experience in the classroom as well as several years of experience as a paraprofessional in a secondary special education resource room for students with MSD. In addition, she was enrolled in a master’s degree program in MSD at the time of the investigation. The special
The special education teacher was responsible for screening and selecting the core content that would be taught during the investigation. Since all of the participants were participating in the state’s alternate assessment, the teacher selected required grade level core content aligned to state standards in language arts, science, and math. We (first and second authors) brainstormed with the teacher (third author) to identify functional applications for each of the selected standards. Once we identified both core content and functional applications for instruction, the teacher screened the students to identify specific items for instruction.

In language arts, the teacher selected the standard to identify meanings of words/phrases from a grade level passage. Specifically, she chose to teach reading grade level words found in the newspaper. While this content could be considered functional (i.e., useful and meaningful to the students), we decided to teach information related to the words as a functional application. The rationale was that the words were meaningless unless the students had a reference for applying them in the context of current events. The core content objective for Jason was to orally read the words president, representative, and governor, and the functional application objective was to verbally identify each (e.g., “The president of the United States is George Bush”). The core content objective for Morgan was to read and receptively identify (i.e., point to) the words mayor, county, and district. The functional application objective was to receptively identify corresponding information about each by pointing to the correct sight word card from a choice of three cards (e.g., point to United States of America when presented with a choice of three names of countries). The criterion for each of these objectives was 100% accuracy for three sessions.

In science, the teacher selected the standard to identify chemical and physical properties of elements and compounds and to categorize them by their properties. Specifically, she chose to teach three basic properties of elements in the Periodic Table: (a) gas, (b) liquid, and (c) solid. As a functional application, we decided to teach Jason to identify ways to change properties during cooking since objectives related to cooking were listed on his IEP. The core content objective for Jason was, when presented with the real items, to verbally state the properties of items used for cooking breakfast (i.e., butter is a solid, milk is a liquid, and the steam from boiling water is a gas). The objective for his functional application was to state ways to change the properties of these items (e.g., melt butter to change it from a solid to liquid, freeze milk to change it from liquid to solid, boil water to change it from liquid to gas). The objectives for Morgan and Rena were based on weather conditions rather than cooking since the teacher believed this knowledge would make them more independent. Specifically, their core content objective was, when presented with three choices, to point to pictures of elements of the weather that were solid (i.e., ice), liquid (i.e., rain), or neither (i.e., sunshine). In addition, their functional application objective was, when present with three choices, to point to pictures of clothing appropriate to each type of weather (i.e., ice–coat and mittens, rain–rain coat and umbrella, sunshine–swim suit). The criterion for each of these objectives was 100% accuracy for three sessions.

In math, the teacher selected the standard to apply the order of operations using addition and multiplication. Specifically, she chose to teach order of operations while teaching students to compute sales tax. While this core
content is functional, we decided to make it more applied by having students compute the sales tax for real items found in newspaper ads. The task analysis for Jason was to enter the amount of the item, press X, press 6, press %, write amount on paper, press clear, enter 1st amount, press +, enter amount of tax, press =, and write total amount on paper. The teacher adapted the task analysis for Morgan and Rena so they would not have to write. Their task analysis was to enter the amount of the item, press X, press 6, press %, and use a Bingo dabber to select the correct amount from three choices presented on a piece of paper. The criterion for each of these objectives was 100% accuracy for three sessions.

**Instructional Setting and Arrangement**

The special education teacher or paraprofessional conducted all instructional sessions in the special education resource room designated for students with functional mental disabilities (i.e., MSD) in a 1:1 format during the first hour of the school day before the students left for their inclusive classes. On most days, the special education teacher, two paraprofessionals, and four students were in the classroom during this time. During instruction, the instructor called one student at a time to a semi-circular table; the student took a seat opposite the instructor.

The teacher used a CTD procedure for instruction and conducted one trial per stimulus per session. She taught each subject area to criterion before proceeding to the next in the following sequence: (a) language arts, (b) science, and (c) math.

**Materials and Equipment**

As shown in Table 1, the teacher prepared two sets of materials: (a) one for instruction and (b) one for generalization assessment. For language arts, the core content instructional materials consisted of 3 in × 5 in white unlined flash cards with the sight words printed by hand in lower case letters with a black marker. The functional application instructional materials consisted of 5 in × 7 in white unlined cards with black computer-printed sight words. The sight word cards for Morgan and Rena also contained computer-generated color pictures paired with the words (e.g., a map of the United States and an American flag above America). Along with each target word card, the teacher presented two additional cards during each trial that contained distracters that had been selected at random from an array of choices (e.g., Canada, Japan, Philippines, Australia). To facilitate generalization, the teacher tuned over flashcards during trials to show abbreviated forms of words, as appropriate. For example, the abbreviation for representative was printed on the back of that card since the abbreviation was often used in newspaper articles when referring to the state representative. Generalization materials for Jason consisted of local newspapers on which the teacher had highlighted the target words with a pink marker. For example, one article showed a picture of the mayor with his name and title written in the picture’s caption. Generalization materials for Morgan and Rena consisted of 5 in × 7 in white unlined cards on which the teacher had pasted newspaper cuttings of the targeted words.

For science, the instructional materials consisted of real cooking ingredients for Jason (i.e., cup of milk, stick of butter, cup of steaming water). For Morgan and Rena, the core content instructional materials consisted of 5 in × 7 in unlined white cards on which the words solid, liquid, and neither had been printed in lower case letters with a black marker; 5 in × 7 in unlined white cards with computer-generated line drawings of ice cycles, rain falling from a cloud, and the sun with the corresponding words (i.e., ice, rainy, sunny) written in lower case letters under each picture with a black marker; and 3 in × 5 in unlined white cards with computer-generated line drawings of clothing appropriate to the weather conditions (i.e., bathing suits, coat and mittens, rain coat and umbrella). Generalization materials consisted 5 in × 7 in unlined white cards containing computer-printed target words in upper and lower case black letters with corresponding computer-generated color pictures (i.e., Solid with stack of blocks, Liquid with raindrops, Gas with gas tanks, Neither with symbol); 5 in × 7 in white unlined cards with color photographs of weather (i.e., icicles, rain puddles on the ground,
TABLE 1

<table>
<thead>
<tr>
<th>Student</th>
<th>Core Content Objective/Materials</th>
<th>Functional Application/Materials</th>
<th>Generalization/Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jason</td>
<td>Orally read <em>president, representative, governor</em></td>
<td>Verbally identify each (e.g., <em>George Bush</em> in response to “Who is the president of the United States?”)</td>
<td>Orally read the target words in the context of a newspaper article</td>
</tr>
<tr>
<td>Morgan</td>
<td>Point to <em>mayor, county, district</em> from choice of three</td>
<td>Point to corresponding information (e.g., <em>6th</em> in response to “What is your district?”) from choice of three</td>
<td>Point to target words from newspaper pasted on cards from choice of three</td>
</tr>
<tr>
<td>Rena</td>
<td>Point to <em>country, state, city</em> from choice of three</td>
<td>Point to corresponding information (e.g., <em>United States</em> in response to “What country do you live in?”) from choice of three</td>
<td>Point to target words from newspaper pasted on cards from choice of three</td>
</tr>
</tbody>
</table>

**Language Arts: Grade Level Vocabulary**

- **Jason:** Orally read *president, representative, governor*
- **Morgan:** Point to *mayor, county, district* from choice of three
- **Rena:** Point to *country, state, city* from choice of three

**Science: Properties of Elements (Gas, Liquid, Solid)**

- **Jason:** Verbally state property when presented with actual ingredients (e.g., butter is a solid)
- **Morgan:** Point to line drawing of elements of weather that were solid (i.e., ice), liquid (i.e., rain), or neither (i.e., sunshine) from choice of three
- **Rena:** Point to line drawing of elements of weather that were solid (i.e., ice), liquid (i.e., rain), or neither (i.e., sunshine) from choice of three

**Math: Order of Operations**

- **Jason:** Use a calculator to compute sales tax
- **Morgan:** Compute price with sales tax for items in newspaper ads
- **Rena:** Compute price with sales tax using different ads/prices

The instructor conducted a minimum of three 1:1 baseline/probe sessions with the participants prior to intervention. For language arts and science baseline/probe sessions, she always followed the three probe trials for core content with three probe trials for functional applications. During probe trials, the teacher first obtained the student’s attention. This was a general attentional cue for Jason (e.g., “Look”) and a specific attentional cue for Morgan and Rena (e.g., pointed to each of three choices and waited for student to focus on each). She then gave the task direction and waited 3 s for the student to respond. She asked Jason to give an expressive verbal response, while she asked Morgan and Rena to use a Bingo dabber to indicate the appropriate price once sales tax was calculated.

sunshine peering through clouds, snow on trees, ice on highway); and 5 in × 7 in unlined white cards with color photographs of clothing appropriate to the weather conditions.

For math, the instructional materials consisted of a calculator and 3 in × 5 in white unlined cards containing color ads cut from the newspaper (e.g., picture of jacket with $11.99 printed under it in black letters followed by a description of the item). In addition, the teacher presented Morgan and Rena with 8 ½ in × 11 in sheets of white unlined paper on which three prices had been written so they could use a Bingo dabber to indicate the appropriate price once sales tax was calculated.
give a receptive response by pointing to the correct card out of three choices placed at random (e.g., unspecified order in a horizontal row or in a vertical row) on the table. For math, the teacher gave a general attentional cue to all students followed by the task direction. When a student made an incorrect response or failed to respond on a step of the task analysis, she ended the session (i.e., single opportunity trial). At the end of each session, she praised the student for working hard, whether or not there was a correct response. During baseline/probe trials, the instructor recorded a “+” for each correct response, a “−” for each incorrect response, and a “0” for each failure to respond. She also recorded a “0” for each of the steps of the math task analysis that students did not have the opportunity to perform.

Instructional Procedures

The instructor used a CTD procedure to teach the targeted tasks. She used the same attentional cues and task directions during instruction that she used during baseline/probe session. During the first session, she immediately prompted the student (0-s delay trial) through the correct response (i.e., identifying sight words, identifying properties of elements, computing sales tax, performing corresponding functional applications). During all subsequent sessions, she waited a 3-s delay interval before delivering a prompt. The controlling prompt for Jason consisted of verbal models for language arts and science content and verbal directions for steps of the math task analysis. The controlling prompts for Morgan and Rena consisted of verbal models paired with gestures (e.g., pointing to the correct card choice) during language arts and science sessions, and verbal directions paired with a model on an additional calculator during math sessions. For each correct response, the instructor delivered praise, and, for each incorrect or no response, the instructor provided a model of the correct response. During instruction, the instructor recorded a “+” for all unprompted and prompted correct responses, a “−” for all unprompted and prompted incorrect responses, and a “0” for all failures to respond following the prompt.

Diagrams of typical session sequences for each of the tasks can be found in Table 2.

Maintenance Procedures

Once the participants reached criterion of a minimum of 3 sessions of 100% accuracy on a task, the instructor conducted intermittent maintenance trials on that word in the same manner as baseline probe/trials for the remainder of the investigation.

Generalization Procedures

The state alternate assessment required that each participating student complete probe trials on each standard prior to and following instruction. These probe trials could not be conducted in the same manner as instruction since the purpose was to assess conceptual understanding. (The alternate assessment also required that teachers submit work samples from instruction to provide evidence that the probe trial format was different.) Because these alternate assessment trials consisted of different materials or applications than those used during instruction, we considered them to be probes for generalization. The instructor conducted these generalization sessions for the three content areas in the fall prior to conducting baseline/probe sessions and again in the spring following instruction on each of the content areas. During each 1:1 probe for generalization, the instructor delivered an attentional cue (i.e., student’s name), delivered the task direction (i.e., What word?), and waited 5 s for a response. She did not provide a consequence since the state alternate assessment does not allow teachers to reinforce or correct responses during probe trials. The instructor conducted one generalization trial per content area at the beginning of the investigation and three trials per content area at the end of the investigation.

Experimental Design

The experimental design employed during the investigation was a multiple probe design across behaviors (i.e., tasks) replicated across participants (Holcombe, Wolery, & Gast, 1994; Tawney & Gast, 1984). While the language arts and science tasks contained trials
on both core content and functional applications, the math task combined functional and core content in each trial. Thus, two separate data paths appear on the first two tiers of the graph while a single data path appears on the third tier (see Figures 1–3).

Reliability

Once per week per condition (i.e., total of 70 sessions), we (the first and second authors) collected reliability data on both the dependent and independent variables. We collected reliability data at the same time during 32.9% of the reliability sessions; otherwise, we took turns collecting reliability data. The overall reliability agreement between reliability data collectors was 100% for the dependent variable and 99.8% (range = 95–100%) for the independent variable.

We used a point-by-point method (Tawney & Gast, 1984) to calculate interobserver reliability agreement with the following formula: number of agreements divided by number of agreements plus disagreements multiplied by 100. We calculated procedural reliability agreement (Billingsley, White, & Munson, 1980) with the following formula: number of observed behaviors divided by number of planned behaviors multiplied by 100. The specific procedural behaviors included (a) using the correct materials for the task, (b) providing an initial attentional cue, (c) delivering the task direction, (d) waiting the proper interval for a response, (e) providing a controlling prompt (during intervention trials only), and (f) delivering the appropriate consequence.

Overall reliability agreement during the investigation was 99.1% (range = 81.8–100%) on the dependent variable and 99.3% (range = 95–100%) on the independent variable. Specifically, dependent variable reliability was 99.5% (range = 83–100%) during baseline and maintenance probe sessions, 98.5% (range = 85–100%) during instruc-

<table>
<thead>
<tr>
<th>Trial Component</th>
<th>Language Arts</th>
<th>Science</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attentional Cue</strong></td>
<td>General cue (“Look”)</td>
<td>General cue (“Look”)</td>
<td>General cue</td>
</tr>
<tr>
<td>Jason</td>
<td>Specific cue (“Look” while pointing to choices)</td>
<td>Specific cue (“Look” while pointing to choices)</td>
<td>General cue</td>
</tr>
<tr>
<td>Morgan and Rena</td>
<td>“Tell me…” (expressive task)</td>
<td>“Tell me…” (expressive task)</td>
<td>“Compute the sales tax for…”</td>
</tr>
<tr>
<td></td>
<td>“Show me…” (receptive tasks)</td>
<td>“Show me…” (receptive tasks)</td>
<td></td>
</tr>
<tr>
<td><strong>Delay Interval</strong></td>
<td>0 s during 1st session and 3 s during subsequent sessions</td>
<td>0 s during 1st session and 3 s during subsequent sessions</td>
<td>0 s during 1st session and 3 s during subsequent sessions</td>
</tr>
<tr>
<td>Jason, Morgan, and Rena</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controlling Prompt</strong></td>
<td>Verbal model</td>
<td>Verbal model with gesture</td>
<td>Verbal directions</td>
</tr>
<tr>
<td>Jason</td>
<td>Verbal model with gesture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morgan and Rena</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Consequence</strong></td>
<td>Praise correct response or provide model for incorrect or no response</td>
<td>Praise correct response or provide model for incorrect or no response</td>
<td>Praise correct response or provide model for incorrect or no response</td>
</tr>
<tr>
<td>Jason, Morgan, and Rena</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
tional sessions, and 100% during generalization sessions; independent variable reliability was 99.7% (range = 96–100%) during baseline and maintenance probe sessions; 99.4% (range = 95.5–100%) during instructional sessions, and 99% (range = 95–100%) during generalization sessions. Overall dependent variable reliability agreement was 100% for Jason, 99.5% (range = 90.9–100%) for Morgan, and 98.7% (range = 83–100%) for Rena; overall independent variable reliability agreement was 99.6% (range = 96.8–100%) for Jason, 99.5% (range = 95.5–100%) for Morgan, and 99.6% (range = 96.8–100%) for Rena.

Results

This investigation paired functional and core content during instruction using a CTD procedure with three students with moderate disabilities. As shown in Figures 1–3, all three students acquired the language arts and science core content. One student also acquired math content, while the two remaining stu-
dents had made minimal progress in math before the investigation ended due to time constraints. Although all three students were labeled as having moderate disabilities and qualified for the state’s alternate assessment, their learning curves were different in the amount of instructional time required and the types of modification needed to meet criterion.

Jason, whose reported IQ score placed him at the upper edge of the moderate disability range, mastered the target skills across all three content areas in the least amount of time. While Jason could not perform the target math skill prior to instruction, his data indicated that he was able to give correct responses during some of the trials on language arts and science content during baseline condition. He could not read the target core content newspaper words in language arts, but he could state 2 out of 3 of the functional pieces of information related to those words prior to intervention. In addition, he could identify an average of 75% of the core content in science although he could apply this to a functional activity with only 33% accuracy. Once instruction was implemented, Jason met criterion on language arts content in an average of 12.5 sessions, on science content in an average of 4 sessions, and on math content in an average of 19 sessions (grand mean = 11.8 sessions). The only difference in the acquisition of functional versus core content was in language arts where it took 4 additional sessions to acquire the core content reading words, which is not surprising since he had demonstrated that he already knew some of the functional content prior to instruction. Because Jason met criterion so quickly across content areas, his instructor chose to continue instruction while she thinned reinforcement to a schedule of VR3 for 2 days at 100% criterion, a practice.
that may have influenced maintenance data. Jason maintained language arts content with a mean of 92.5% accuracy (functional content = 88.3%, core content = 96.7%), he maintained science content with 99% accuracy (functional content = 100%, core content = 98%), and he maintained math content with 96.4% accuracy. During the generalization probes that Jason’s instructor conducted for his alternate assessment, Jason increased his ability to identify language arts core content from 0% to a mean of 88.7%, science core content from 27% to a mean of 100%, and math core content from 0% to a mean of 100%. Although functional content was not required in the alternate assessment, Jason increased his ability to identify language arts functional content from 66.6% to a mean of 100%, science functional content from 33.3% to a mean of 100%, and math functional content from 0% to a mean of 100%.

Unlike Jason, Morgan struggled to acquire the targeted content across curricular areas. While Morgan could not perform the target language arts or math skills prior to instruction, his data indicated that he was able to give correct responses during some of the trials on science content during baseline condition (functional content = 62.9%, core content = 11.1%). Once instruction was implemented, Morgan met criterion on language arts content in an average of 30 sessions (functional content = 24 sessions, core content = 36 sessions) and on science content in an average of
36.5 sessions (functional content = 4 sessions, core content = 69 sessions). When Morgan struggled over time to reach criterion on core content in language arts and science, his instructor made modifications to the instructional procedure. In language arts, she began using differential reinforcement by delivering praise for correct responses before the prompt only and ignoring correct responses following the prompt. After this modification was implemented for four days, Morgan began to increase the number of correct responses before the prompt. In science, she added tokens to be exchanged for minutes of computer time in addition to praise as part of the differential reinforcement procedure when he failed to reach a third session of criterion after an extended period of instruction. After this modification was implemented for 14 days, Morgan finally reached criterion. Morgan’s instructor also continued instruction in language arts and science beyond criterion because she hoped that he would eventually meet three consecutive days of correct responding in both functional and core content during the same sessions.

Due to time constraints, we decided to begin instruction in a new area of content before instruction ended on a previous area of content. Even with this modification to the experimental design, Morgan failed to meet criterion in math prior to the end of the investigation, although his correct responses increased from 0% to 49% before instruction ended. Because of Morgan’s erratic performance during instruction, his instructor did not thin reinforcement once criterion was met. Morgan maintained language arts content with a mean of 75% accuracy (functional content = 76.2%, core content = 73.7%), and he maintained science content with 72.2% accuracy (functional content = 100%, core content = 44.4%). During generalization probes that Morgan’s instructor conducted for his alternate assessment, he increased his ability to identify language arts core content from 0% to a mean of 100% and science core content from 0% to a mean of 77.7%, but he failed to increase his math core content from 0%. Although functional content was not required in the alternate assessment, Morgan increased his ability to identify both language arts and science functional content from 0% to a mean of 100% during the alternate assessment probes.

Like Jason, Rena quickly acquired targeted content in language arts; but, like Morgan, she also struggled to acquire the targeted content in science. During baseline condition, Rena identified one piece of functional information during a single session in language arts, she was able to give correct responses during some of the trials on science content (functional content = 58.3%, core content = 20.8%), and she failed to make any correct responses on math content. Once instruction was implemented, Rena met criterion on language arts content in an average of 9 sessions (functional content = 10 sessions, core content = 8 sessions) and on science content in an average of 22 sessions (functional content = 32 sessions, core content = 12 sessions). Although the instructor continued instruction in language arts long enough to thin reinforcement to VR3 for two days, she continued instruction on science content without thinning reinforcement, hoping that Rena would reach criterion on both functional and core content on the same day; when this failed to occur after 18 additional sessions, she discontinued instruction in science and began instruction in math since the deadline for submission of alternate assessment portfolios was drawing near. When Rena failed to show progress in math over 13 sessions, the instructor discontinued instruction and conducted the alternate portfolio assessment probes. Rena maintained language arts content with a mean of 90.8% accuracy (functional content = 86.6%, core content = 95%), and she maintained science content (one session) with 66.6% accuracy (functional content = 33.3%, core content = 100%). During the generalization probes that Rena’s instructor conducted for her alternate assessment, Rena increased her ability to identify both language arts and science core content from 33.3% to a mean of 88.9%. In addition, she increased her ability to identify language arts functional content from 0% to a mean of 88.9% and her ability to identify science functional content from 33.3% to a mean of 100%. Although Rena was unable to perform any correct responses in math during the baseline probe session and showed no progress during intervention, she performed 22% percent of the
correct responses during a single post-intervention generalization probe session (mean = 7.3%).

Discussion

The purpose of this investigation was to teach both core and functional content simultaneously in a meaningful context. We did not seek to compare the acquisition of core content and functional content, but rather to teach them together so that the participants would (a) learn core content required for all students in the school, as well as (b) learn skills related to the required core content that would be meaningful to their lives. We made the assumption that learning core content would result in positive outcomes in the students’ alternate assessment. In the past, teachers of students with MSD often targeted functional academic skills for instruction based on ecological assessment. In this study, we took another approach, beginning with grade level core content standards required in the state’s alternate assessment and then adding corresponding functional content in an effort to make the identified core content more meaningful to the students. Although students continued to have access to core content in the general education academic classes in which they were included, they received supplementary direct instruction on the skills targeted for this study in the special education resource room.

We sought to teach core content and functional content together in response to personal observations we have made since the state’s current alternate assessment, which targets core content, was mandated. These observations were made in multiple schools across the dozen districts in which we supervise student field experiences. Since the alternate assessment of core content standards identified by the state has become high stakes, we have repeatedly observed teachers teaching isolated bits of core content information out of context. Often students have been taught to make responses without being able to demonstrate that they have acquired understanding of an underlying concept. For example, one standard assessed requires the students to use the Pythagorean Theorem to solve a problem. We observed students as they were given a series of steps to follow (presented through pictures and symbols) that required them to put numbers into a calculator, press the correct symbol, and then match the number on the calculator to one of three choices. In other words, they were given the formula \( a^2 + b^2 = c^2 \), given the amount of the first two variables, and directed to put them into the calculator in the correct order to solve for the third variable. In essence, this is a matching and a sequencing task. Students could successfully complete it even with no conceptual understanding of the Pythagorean Theorem. Many of these students had no conceptual understanding of the numbers, they simply followed the steps in order and matched the number on the calculator with one on the sheet. We observed daily instructional sessions targeting this isolated skill of solving for \( c^2 \) that utilized a great deal of instructional time across the school year for what ultimately appeared to be little gain. Students clearly can learn to follow a series of instructions, but, if they cannot apply knowledge for practical purposes, the skill is of little use. The students were taught a response that would earn points on the assessment, but which is of no use in any other circumstance. While this is clearly not the intent of the alternate assessment, this is what we have observed and continue to observe in classrooms; therefore, it seems important to ensure that core content is taught in a meaningful context.

In addition, because many students with MSD have not been able to acquire the required core content as it is presented in general education classes (e.g., large group lectures, discovery learning) and because they need longer periods of intensive instruction than is typically provided in general education classes, we have observed teachers pulling students out of inclusive classes to provide daily instruction in a resource setting. In some cases, entire days across months have been devoted to instruction of single pieces of required core content. There is a finite amount of time available for instruction, and spending a large amount of it for instruction on isolated pieces of core content may prevent teachers from devoting time to functional skills that might be useful or important to the students’
daily lives when they transition out of the school setting.

Finally, we have received first-hand reports of administrators dictating that IEPs be written to contain core content only or that functional skills on IEPs be given minimal instruction time (e.g., 30 min once per week). Although the state in which we conducted this investigation may not represent national trends, the volume of classrooms in which we have observed has convinced us that we need to develop a way to provide more meaningful instruction on core content.

We struggled in identifying functional applications of the core content targeted for this investigation. For this reason, we ruled out including some of the content in the investigation that the instructor was required to teach during the same year (i.e., identifying elements of short stories, using persuasive writing techniques, identifying the effects of straight line motion, identifying components of ecosystems).

For the language arts standard, we selected grade level sight words found in the newspaper for the following reasons: (a) the words would be useful in the social studies classes the students attended, (b) the students might encounter these words in their everyday lives; (c) the words might make them more aware of current events in their community; and (d) the words might allow them to engage in interactions with peers, family members, and community members. In selecting words from the news, we noted that general education classrooms in the region receive daily newspapers as part the educational mission of the local major newspaper and that teachers often use the newspaper to facilitate discussion of current events. Because we believed that recognition of the sight words out of context was meaningless, we added information related to the words as functional content. One of the problems encountered during the investigation was that the information changed as current events changed. For example, the governor was replaced by the opposition during the fall election. To address this, we began presenting nontargeted information as instructional feedback during the consequence of each trial. For example, the instructor would say, "Yes, Ernie Fletcher used to be the correct answer because he used to be the governor. Since the election, our new governor is Steve Beshear." This proved to be an effective intervention since the students began responding with the new information over time. Thus, we urge teachers to consider the dynamic nature of instructional targets that may be similar in nature and to make plans to use strategies to address such changes when they are necessary.

The science standard, although we did not anticipate this, proved more difficult to link to functional content. When we identified properties of the elements of the Periodic Table as the required middle school content to address in this investigation, we struggled to make this information relevant to the students. In time, we decided to use different functional applications across students. Since Jason had cooking identified for instruction on his IEP, we decided to link the properties of solid, liquid, and gas to this activity and to teach how these properties can be changed. Since the remaining participants did not engage in cooking, we selected weather conditions as examples of properties with which the remaining students might be more familiar. Instead of discussing how the properties of weather changes (e.g., rain turns to sleet, ice, or snow), we decided to link the weather to appropriate dress. This focus allowed us to teach only the two properties of solid and liquid. Since the alternate assessment required that students have three options during probes to decrease the likelihood of getting a correct answer by chance, we added a third response of "neither" and linked this to sunshine, allowing us to add additional options for dressing for sunny weather. In addition, while we required Jason to make an expressive verbal response, we chose to allow the remaining students to make receptive responses. Once instruction was designed, the targets for science differed as to whether the students were presented with concrete objects (e.g., cooking ingredients) versus pictures and as to the type of response (i.e., verbally state response versus make a choice from a selection of possible responses). In making functional links to core content, we recommend that teachers consider student differences and student IEP objectives, as well as what might be most meaningful for each student given their backgrounds and abilities, as well as their current and future environments.
Finally, although we anticipated that the math standard would be the most difficult skill to teach in a functional manner, this proved false. When we selected order of operations as the required core content, we found that it had many useful applications and that peers often learn math through solving word problems based on real-world applications. Thus, instead of teaching core content and functional content as two separate targets for instruction, we were able to combine the two by teaching order of operations within the meaningful task of computing sales tax on items for purchase. Computing sales tax, however, proved to be more difficult than the other two identified tasks, likely because it was a chained task rather than a discrete task. To master the chained task, the students had to learn a sequence of linked responses instead of six single responses, and some of the steps of the task changed with each application (e.g., entering the price) since the price changed with each trial. Due to snow days, absences, and the extended time needed to master science content, we ran out of instructional time before two of the students mastered the math task. If instruction had not been limited by the time lag requirement of the experimental design, it is possible that these students might have mastered the math task. There are, however, no data to support this. The instructor was forced to conduct the alternate assessment probes without having devoted sufficient time to instruction in math for two of the students. When chained tasks are targeted, we recommend that teachers begin instruction early in the academic year so that there will be sufficient time for mastery.

The current investigation began in September and ended in April. We assumed that this timeframe would allow enough time to teach three sets of content across the three required subject areas by the time the alternate assessment portfolios were due. In the case of Jason, this timeframe was adequate. Jason, however, was at the upper end of eligibility for the alternate assessment. He quickly mastered both the functional and core content that was presented to him and maintained this with a high degree of accuracy over time.

Morgan and Rena had more difficulty mastering the content that was presented to them. Morgan, in particular, struggled with both language arts and science content. During instruction, he often watched the face of the instructor for feedback as his hand hovered over each potential response before he would point to a final choice. The instructor was careful to withhold smiles or praise until he made a final choice and to redirect his attention to looking at the choice instead looking at facial expressions. In addition, Morgan often waited for the prompt instead of making a choice. For this reason, we decided to use differential reinforcement. Thus, during language arts, the instructor began to praise Morgan for correct responses before the prompt only and to withhold praise for correct responses following the prompt. This resulted in an increase in correct responses before the prompt, although it still took several weeks for Morgan to reach criterion on both functional and core content. When Morgan demonstrated the same behavior in making correct responses on core content in science, we added tokens that could be traded for computer time to differential reinforcement. Again, it took several weeks for Morgan to reach criterion. Even then, Morgan proved to be inconsistent in making correct responses on core content during subsequent sessions. Hoping to make his responses more consistent, the instructor tried making the task more concrete for Morgan by having him feel an ice cube to see that it was a solid and to put his hand in water to feel that it was a liquid at the beginning of instructional sessions. Even with this addition to instruction, Morgan failed to consistently make the connection between a picture of ice and the word \textit{solid} and a picture of rain and the word \textit{liquid}.

Although Rena quickly mastered language arts content, she also struggled with science. Unlike Morgan, however, she had difficulty acquiring both functional and core content. As time passed, her ability to identify correct responses on core content increased while her ability to identify correct functional content decreased. The only variable that that we could identify that seemed to affect her performance was her erratic attendance in school. In addition to missing days for snow, Rena also had 12 absences for illnesses while Morgan and Jason only had one absence each. Although Rena did not show progress during several weeks of math instruction, she per-
formed a few steps of the task correctly during generalization probes, which indicates that, given continued instruction, she eventually may have mastered this task.

A limitation of this investigation is that it used 1:1 instruction that prevented students from learning through observation, a practice that has been effective in the past (e.g., Palmer, Collins, & Schuster, 1999; Smith, Collins, Schuster, & Kleinert, 1999; Stonecipher, Schuster, Collins, & Grisham-Brown, 1999). Another limitation to this study is that it relied on instruction conducted in a segregated setting (i.e., the special education resource room). Balancing the need for direct instruction on required content and the benefits of participating in inclusive settings (e.g., Kennedy, Shukla, & Fryxell, 1997) is a difficult task for teachers. To keep instruction minimal so that students would not miss time in their inclusive classes, the instructors conducted sessions as soon as students arrived each morning and limited sessions to only three trials in language arts and science and only one trial in math. Thus, instructional sessions rarely, if ever, lasted more than 5 min each. It is possible that longer sessions with more instructional trials, as well as teaching in a small group format, would have decreased the number of sessions to criterion.

Often, teachers must decide which is more important—to score well on the alternate assessment or to be exposed to the social and communicative benefits of participation in inclusion even if students fail to acquire required academic content in those settings. Indeed, more research is needed to find ways to facilitate acquisition of core content for students with MSD in inclusive settings. For example, Collins et al. (2007) and Collins, Hall, Branson, and Holder (1999) found that ensuring that there is systematic daily exposure to targeted information in inclusive settings can result in acquisition even if direct instruction is not used. In addition, in some studies students learned core content (e.g., science vocabulary and core content) using direct instruction in inclusive settings (Jameson, McDonnell, Johnson, Riesen, & Polychronis, 2007; McDonnell et al., 2006); however, the instructional trials tended to be during transitions or breaks within the general education setting rather than during adapted general education activities. Other studies addressing instruction of students with MSD in inclusive settings reported positive outcomes, but they were for social and communication skills, not core content (e.g., Carter, Sisco, Melekoglu, & Kurkowski, 2007; Dymond et al., 2006). These are important outcomes, but it is also important to be clear regarding exactly what skills and knowledge students are acquiring in inclusive settings. It should be noted that the students who participated in this study also participated in academic classes (e.g., science, social studies) with their same age peers. The teacher, however, found it necessary to conduct direct instruction on core content identified for the alternate assessment in the resource room in addition to what the students received in the general education settings for the students to reach mastery.

Perhaps the major implication of this investigation is that it is possible, although challenging, to combine the instruction of core content with the instruction of functional skills. The data, however, show that we cannot assume the link between these two without intentional planning and instruction. It also is important to note that we only selected three pieces of the state’s required core content for alternate assessment to address in this investigation. The instructor also taught 12 additional targets for the alternate assessment to each of these students during the year that they participated in the investigation. At the same time, as noted in the overviews of the students’ IEP objectives, she also routinely taught functional skills as part of the students’ curriculum. This was possible because she was responsible for only four students during the academic year that this investigation was conducted. During the previous year, she had had 7 students on her caseload (a total of 95 alternate assessment standards to teach), which made it more difficult to address both functional and core content. Since teachers now are required to teach core content, it seems critical to ensure that it is relevant to the students who will be spending hours, days, and even months learning it, especially when some are likely to master only a few skills in an entire year, even with intensive instruction.

Several literature reviews have focused teaching core content to students with moderate and severe disabilities (i.e., significant
cognitive disabilities). Browder and Xin (1998) reviewed 48 studies on sight word instruction and recommended that further investigations needed to focus on teaching functional reading that students could apply in their daily routine. More recently, Browder, Wakeman, Spooner, Ahlgrim-Delzill, and Algozzine (2006) reviewed 128 studies on reading instruction and recommended that further investigation is needed on the types of instruction that is needed to teach a broader range of literacy skills than sight word recognition (e.g., comprehension). Courtade, Spooner, and Browder (2007) reviewed 11 studies on science instruction and recommended that further investigation needed to focus on teaching a broader scope of content linked to state standards. Browder, Spooner, Ahlgrim-Delzill, Harris, and Wakeman (2008) reviewed 54 studies on math instruction and recommended that further investigations needed to focus on teaching all components of math skills and ensuring that these skills generalize to real life applications.

The current investigation extends the literature reviewed by these authors while addressing their recommendations for future research. In summary, this investigation was successful in combining functional and core content in teaching skills to students with MSD. Continued research, however, is needed on this topic, especially since we encountered a number of challenges as the instruction continued across the academic year. All students, whether they have disabilities or not, can benefit from learning functional applications of core content that have relevance in their daily lives, thus, teaching core content in a more meaningful context was the purpose of this investigation.

References

Falkenstine, K. J., Collins, B. C., Schuster, J. W., & Kleinert, K. (2009). Presenting chained and dis-


Received: 18 August 2009
Initial Acceptance: 20 October 2009
Final Acceptance: 7 January 2010

Functional Core Content / 39
Teaching Social Skills to Enhance Work Performance in a Child Care Setting

Sabra Gear, Jonna Bobzien, Sharon Judge, and Sharon A. Raver
Old Dominion University

Abstract: Adults with intellectual disabilities face difficulty seeking employment in the community workforce. Using a single-subject design, this study examined the utility of role playing and self-management strategies to enhance work performance by promoting the social skills of a young woman with Down syndrome working in a community child care setting. Social behaviors taught included: (a) establishing and maintaining eye contact with adults during conversation, (b) waiting to speak until adults finished speaking, and (c) giving appropriate verbal responses to directions, feedback, or criticism. Results indicated moderate-to-large increases in target behaviors during intervention, with these changes maintained for three months following training. The training protocol was effective in teaching prosocial behaviors which improved work performance. Implications for practice are discussed.

It has long been understood that individuals with intellectual disabilities seeking employment have functional difficulties beyond obvious cognitive or physical limitations (Foy, Massey, Duer, Ross, & Wooten, 1979). Weaknesses in verbal skills such as limited language repertoires and atypical speech patterns (Kroeger & Nelson, 2006; Nientimp & Cole, 1992), emotional and behavioral deficits such as social withdrawal (Mastropieri & Scruggs, 1985–1986), absent or delayed smile and eye contact, as well as deficits in cooperation, turn-taking (Reeve, Townsend, & Poulson, 2007), and poor generalization may result in many individuals with intellectual disabilities working in noncommunity or supported work situations only.

To support the acquisition of appropriate work behaviors by individuals with disabilities, professionals have used a variety of job coaching and workplace support methods. Customized employment (Griffin, Hammis, Geary, & Sullivan, 2008; Luecking, Cuozzo, Leedy, & Selznow, 2008), self-management interventions (Ganz & Sigafoos, 2005), simulated workplace training combined with direct work experience (Lattimore & Parsons, 2006), job coaching (Mautz, Storey, & Certo, 2001; Ohtake & Chadsey, 2003), team (Gill, 2007; Hogansen, Powers, Geenem Gil-Kashiwabara, & Powers, 2008) and community-based approaches (Carter et al., 2009), and social skills training (Foy et al., 1979; Mautz et al., 2001; Storey & Provost, 1996) have been used, with varying degrees of success, depending on the needs of the potential employee and the demands of the workplace (Duran, 1984; Hughes, Alberto, & Fredrick, 2006; Lattimore, & Parsons, 2006; Mautz et al., 2001).

Recently, self-management strategies have been used to assist individuals as they are transitioning to community workplace settings. Self-management techniques rely on cognitive-behavioral theory which involves the process of changing one’s thinking or private verbal behavior to impact overt behavior (Ganz & Sigafoos, 2005). Researchers in self-management with individuals with intellectual disabilities have reported improvements in work-related social skills including conversation, sharing, peer interactions, and task completion, as well as reductions in stereotypic behaviors and other nonproductive behaviors (Browder & Minarovic, 2000; Ganz & Sigafoos; Hughes et al., 2006).

Correspondence concerning this article should be addressed to Sabra Gear, Department of Communication Disorders and Special Education, Old Dominion University, Virginia Beach Higher Education Center, 1881 University Drive, Room 243-C, Virginia Beach, VA 23453. Email: sgear@odu.edu
Lattimore and Parsons (2006) found that direct training in the workplace combined with training in an adult education vocational program with a simulated work setting, assisted four workers with autism or intellectual disabilities to be more successful in a supported employment situation. These workers displayed more rapid acquisition of job skills when work skills were practiced at both the simulated workplace and in the real workplace. Consequently, using a training strategy outside of the immediate job setting may offer promise in acquiring social skills.

Although job coaches have historically been valued partners in community workplaces, some researchers (Ohtake & Chadsey, 2003; Storey & Provost, 1996) suggest that job coaches may sometimes become a barrier to social interactions between workers with disabilities and their co-workers without disabilities. When job coaches were in the community workplace, supported workers were observed to interact more with the job coaches than with their co-workers, lessening the opportunity for social integration. Storey and Provost used a social skills intervention to decrease social interactions between job coaches and supported workers, and increase social interactions between supported workers and their co-workers. Ohtake and Chadsey cited a number of supported worker problems requiring more intrusive job coach facilitation strategies such as challenging behaviors, poor social skills, lack of job completion, and inappropriate verbal comments in the community workplace. For these reasons, professionals need alternative ways to train and maintain appropriate social interaction behaviors for individuals with intellectual disabilities and their co-workers.

Fostering productive social interactions between supported employees and co-workers without disabilities is critical for success in any community work site (Johnson, Mellard, & Lancaster, 2007). Role playing is one of the most common ways to assess social skills (Biielecki & Swender, 2004). Role playing techniques have also been used to increase appropriate social skills in both school and workplace settings (Foy et al., 1979; Shepherd, 2009). For example, Shepherd describes role playing as a component of a direct modeling approach to increasing opportunities for students to interact appropriately with peers and authority personnel, recognize social cues, and develop social competence in school settings. In a community work program, Foy et al. used role playing to increase eye contact, speech duration, overall assertiveness, and to request a behavior change (e.g., find someone else to stay late on the job) in four adults with interpersonal social skill deficits. Having reliable training methods for teaching effective responses to difficult interpersonal situations is essential since inclusive work settings may not provide sufficient natural reinforcement for individuals with disabilities to foster the development of positive and appropriate community workplace behaviors (Alber, Heward, & Hippler, 1999).

Fostering productive social interactions between supported employees and co-workers without disabilities is critical for success in any community work site (Johnson, Mellard, & Lancaster, 2007). Role playing is one of the most common ways to assess social skills (Biielecki & Swender, 2004). Role playing techniques have also been used to increase appropriate social skills in both school and workplace settings (Foy et al., 1979; Shepherd, 2009). For example, Shepherd describes role playing as a component of a direct modeling approach to increasing opportunities for students to interact appropriately with peers and authority personnel, recognize social cues, and develop social competence in school settings. In a community work program, Foy et al. used role playing to increase eye contact, speech duration, overall assertiveness, and to request a behavior change (e.g., find someone else to stay late on the job) in four adults with interpersonal social skill deficits. Having reliable training methods for teaching effective responses to difficult interpersonal situations is essential since inclusive work settings may not provide sufficient natural reinforcement for individuals with disabilities to foster the development of positive and appropriate community workplace behaviors (Alber, Heward, & Hippler, 1999).

Often, individuals with intellectual disabilities have to learn to elicit reinforcement in inclusive settings by behaving in a manner that promotes positive attention and praise from co-workers. Consequently, developing desirable social behaviors should aid an employee’s acceptance in a workplace. Professionals need a strategy to promote work behaviors that is non-intrusive and yet powerful enough to maintain changes within the actual work setting. Therefore, the present study used structured role playing that promoted the development of self-management skills to improve the social skills of a young woman with moderate intellectual disability working as a volunteer in a community child care setting. Specifically, this study examined if this training protocol would be effective in training, and maintaining, the following prosocial behaviors: (a) establishing and maintaining eye contact with adults during conversation and feedback, (b) waiting to speak until adults were finished speaking, and (c) giving appropriate verbal responses to directions, feedback or criticism from adults.

**Method**

**Setting**

The present study took place at a large public university in a metropolitan area on the Eastern seaboard of Virginia. It was conducted in the university’s child care setting which served young children from 8 weeks through 3-years-old, with and without disabilities. The training was conducted in a conference room outside the child care classroom for 2-year-olds in which the subject was working. The participant worked...
mornings, except for federal and state holidays, as a volunteer, without wages during the five months of the study.

Participant

The participant was a 20-year-old Anglo-American female with Down syndrome who was identified early in the public school setting as having moderate intellectual disability. She completed high school with a special diploma, documenting that she had met her individualized educational program goals. As an adult, her expressive verbal behaviors consisted of fairly well-articulated sentences of approximately 5–10 words. She interacted adequately with the preschool children in their activities at the child care center; however, she required frequent redirection by her supervisor to complete assigned tasks in a timely manner. Throughout the study, the participant did not receive any post-secondary school or disability services.

Social interactions between the participant, her supervisor, and co-workers were limited by her infrequent eye contact and her inappropriate verbal and nonverbal behaviors. In work performance evaluations, the participant’s supervisor indicated that participant frequently tried to engage co-workers in conversation about personal issues while they were performing work tasks and that she did not respond appropriately to constructive criticism. For example, it was noted that when she was given negative feedback about her work performance, she hung her head and typically hit her forehead with the palm of her hand and said, “I’m so stupid,” or something similar to this statement. Despite these negative responses from her supervisor and co-workers, when the participant was questioned during performance evaluations about her overall feelings regarding her work, she stated that the volunteer work was her “dream job” and she strongly wanted to continue. Based on weekly evaluations, it was determined that she was at-risk to lose her volunteer work due to her inappropriate behaviors, low-rate of prosocial behaviors, and a pattern of erratic work performance.

Design

A single-subject, alternating treatments design (ATD) design (Kennedy, 2005) was used to determine the effectiveness of two training protocols upon three specific sets of social skills. The baseline phase covered two or three daily sessions over three days of data collection. The implementation of the first training protocol (Intervention I) consisted of a minimum of 18 days of intervention, followed by the second training protocol (Intervention II), which consisted of an additional 12 days of intervention. During the maintenance phase, which consisted of 14 days at a minimum, no intervention training was conducted but the supervisor and co-workers were encouraged to give appropriate feedback to the participant whenever target behaviors were displayed. The follow-up phase began five weeks after conclusion of the maintenance phase. During this follow-up phase, the supervisor and co-workers were given no guidance in their interactions with the participant and were aware that the training was concluded.

Dependent Variables: Prosocial Skill Behaviors

Dependent variables were eye contact, waiting to respond, and appropriate verbal response to directions, feedback, or criticism. Eye contact was operationally defined as the participant maintaining her eyes on the face of the supervisor or co-worker with whom she was speaking throughout the conversation. A conversation was considered to begin when the participant, a supervisor, or co-worker initiated a verbal statement toward the participant. A conversation was considered to end when the participant, a supervisor, or co-worker broke off the conversation, or when there was a five-second lapse in the conversation (e.g., latency). Eye contact during directions, feedback, or criticism was defined as maintaining eyes in the direction of the speaker when receiving direction, feedback, or criticism. Observers used a digital timer to measure duration and latency of time in seconds and minutes.

Waiting to respond and providing appropriate verbal response were defined as follows:

When a supervisor or co-worker initiated a verbal exchange by giving either directions, feedback or criticism, the participant maintained her eyes on that individual’s face throughout this verbal exchange; waiting
until the individual was finished speaking, and then provided an appropriate verbal response to the co-worker or supervisor. The participant was trained to answer with the following responses, or successive approximations, which were defined as appropriate verbal response: (a) thank you for sharing that with me, (b) that’s a good idea, and (c) I’ll work on that.

**Observation and Recording**

During all phases of the study, the rates of occurrence of the dependent variables were measured using a frequency count. Using time-sampled event recording, the frequency of these target behaviors were counted during an observation session of 10 minutes measured with a digital timer and manually recorded on pencil and paper data collection sheets. When an opportunity for a target behavior occurred, observers notated a “1” on the data sheet when the participant responded as defined and a “0” when the participant did not respond as defined in the study. If there were no opportunities for the participant to exhibit any of the target behaviors during an observation time (e.g. no supervisor or co-worker interaction occurred during the observation period), observers notated “no opportunity,” and then waited at least 10 minutes before another observation session was begun. Data were collected at random intervals between 9:00 am and 12:00 noon, Monday through Friday, through a two-way mirror in the participant’s childcare observation room.

During the intervention phases of the study, two trainers/observers took the participant out of her child care classroom daily to a small conference room located within the childcare center for approximately 20 minutes to teach her the target behaviors using a training protocol script. Immediately following this training session, when the participant returned to work in the classroom, an observation session was normally conducted. Intervention phases continued until the data showed a clear reversal in trend from the baseline data, for four consecutive observation sessions. Following the intervention phases, data collection was continued on the dependent variables for the maintenance and follow-up phases, although no training was provided.

**Interobserver Reliability**

Inter-observer agreement was collected and recorded on 20% of all observation sessions in each experimental condition. Overall inter-observer agreement was calculated by dividing the total number of agreements by the number of agreements plus disagreements, and then multiplying by 100 percent (Kazdin, 1982). An agreement was scored when both observers recorded the occurrence of the presence of a target behavior and a response when it was relevant to the target behavior. Prior to the study, observation and data collection training continued until the observers achieved 90 percent agreement for three consecutive observation sessions. The inter-observer agreement ranges and means are as follows per each target behavior: a) eye contact (range = 82%–98%, mean = 90%), waiting to respond (range = 80% - 100%, mean = 90%), and appropriate verbal responding to directions, feedback, or criticism (range = 80%–100%, mean = 90%).

**Social Validity Data**

The social validity of teaching the targeted prosocial behaviors was determined by the use of a five-item pre-post questionnaire administered to one supervisor and two co-workers of the participant. Questionnaire items included closed-ended questions using a Likert-type 10-point scale [e.g., “learns new tasks with great difficulty” (1) to “learns tasks easily” (10)] and one open-ended question which asked respondents to describe specific social interactions the participant needed to improve in the workplace. The questionnaire was designed to provide qualitative and quantitative information regarding co-workers’ experiences and perceptions about working with a co-worker with disabilities. The questionnaire was pilot-tested, prior to the study, with a selected group of three co-workers to determine the ease of use, clarity of questions, and relevance of questions to the intent of the study. The pilot-test determined that the questionnaire needed revision which was completed prior to its implementation in the study.
**Procedure**

*Training protocols.* The independent variable included two training protocols that used role-playing and focused instructional interventions conducted outside the immediate workspace by two trainers/observers. Both training protocols involved written scripts in which the participant and trainers alternately role-played the participant’s role as worker and the role of the participant’s supervisor. The scripts specified who played which role, what the situation would be, when roles were to be alternated, and what each individual would do and say as a function of her role. The scripts were updated on a daily basis, based on the supervisor’s daily feedback about the participant’s work performance and areas of concern. The scripts simulated work-related social interactions between the participant, supervisor and/or co-workers that had actually happened or those that were likely to occur on the job. Each scripted training session included several (4–6) role-playing opportunities for the participant to respond to simulated social interactions that required the use of the target behaviors. For example, the participant was given directed instruction on how to establish and maintain eye contact during conversations and interactions, how to wait to respond until the other speaker was finished, and how to provide appropriate verbal responses to criticism, feedback or when given directions while establishing eye contact. An abbreviated excerpt of one of these scripted sessions follows. A full protocol of the participant’s and trainers’ scripted dialogue is available upon request from the first author.

*Trainer 1:* “We are here to role-play social skills. One of the skills is maintaining eye contact. Let’s role-play how we pay attention by focusing our eyes on each other’s faces when we talk.”

*Trainer 2:* [supervisor role] “The way you model songs and hand motions helps children participate in music activities.”

*Participant:* [in her own role] “Thank you.” (while looking at the trainer)

*Trainer 2:* “Good job! Three appropriate responses we want to role-play with you are, ‘Thank you for sharing that with me. That is a good idea. I will work on that.’ Now, let’s practice showing how we maintain eye contact, waiting until the person is finished speaking, and responding.”

*Trainer 1:* [supervisor role] “I need for you to finish all your duties for the children, like cleaning the tables at snack time, before you take a break.”

*Participant:* [in her own role] “That is a good idea. I will work on that.”

*Trainer 1:* “You did a nice job! Professionals follow directions, listen to feedback, or accept criticism by keeping their eyes on the person talking, waiting and responding appropriately as you just did.”

Interventions I and II were differentiated by the script content and subsequent role-playing dialogue between participant and trainers, and focusing instruction upon teaching specific prosocial targeted behaviors. The instructional focus of Intervention I was initially on establishing and maintaining conversational eye contact, while the focus of Intervention II also included waiting to respond, and providing appropriate verbal responses to directions, feedback, or criticism.

*Fidelity of implementation.* Data of fidelity of implementation were collected daily during the intervention phase using a checklist developed directly from the training protocol. The occurrence or non-occurrence of each step on the checklist was noted for 20% of the intervention sessions. Fidelity of implementation was maintained at 90% throughout the study (range = 80%–100%, Mean = 90%). The scripts were crosschecked with the procedural checklist to verify fidelity of implementation data.

**Results**

Results revealed positive changes in the occurrence of all target behaviors from baseline levels following intervention. The outcome of each target behavior will be discussed separately.

*Conversational Eye Contact*

Figure 1 shows the data point values measuring conversational eye contact behavior when the participant, a supervisor, or a co-worker
initiated conversation. During the baseline phase, six data points were collected on the percentage of conversational eye contact to the number of opportunities provided during an observation session ($M = 45.56\%$). During the intervention phases, 18 data points were collected ($M = 62.70\%$). For the maintenance phase, 15 data points were collected ($M = 77.07\%$); and four data points were gathered during the follow-up phase ($M = 97.75\%$).

Figure 1 reveals moderate to large gains in the mean levels of conversational eye contact behavior occurred between baseline and the maintenance phase (31.51\%), and the initial baseline and the follow-up phase (52.19\%). Small gains in the mean levels of conversational eye contact behavior occurred between the intervention and the maintenance phases (14.37\%), and between the initial baseline and intervention phases (17.14\%).

A best-fit-line approach (least squares regression) found a small negative trend within the initial baseline phase (slope $= -0.10$) and a small to moderate positive trend within the intervention phase (slope $= 1.62$). A small positive trend was revealed from the initial baseline to the intervention phases (slope $= 1.49$). A small positive trend was revealed from the initial baseline to the follow-up phase (slope $= 1.15$). An overall reversal in trend for this target behavior was found. The stability of data based on a criterion of plus or minus 50% of the mean found the data values to be stable during the maintenance and follow-up phases. The initial baseline and intervention phases showed only mild variability in data.

**Eye Contact during Directions, Feedback, or Criticism**

Figure 2 presents the data point values measuring participant’s eye contact behavior during directions, feedback, or criticism. During baseline, nine data points were collected on the percentage of eye contact displayed when given an opportunity to receive directions, feedback, or criticism given by a supervisor or co-worker ($M = 41.66\%$). During interventions, 30 data points were collected ($M = 61.89\%$). For the maintenance phase, two data points were collected ($M = 100\%$) while
in the follow-up phase, two were collected ($M = 100\%$).

Figure 2 shows moderate gains in eye contact occurred during directions, feedback, or criticism between baseline and the maintenance phase (58.34%). There was a 58.34% change between baseline and the follow-up phase and intervention and a 38.11% change between the maintenance phases. Similar to the results found for appropriate verbal response behavior, the smallest gain in eye contact occurred during directions, feedback, or criticism between the initial baseline and the intervention phases (20.23%), although these still represent a socially valuable behavioral change.

A best-fit-line approach (least squares regression) revealed a high positive trend within the baseline phase (slope = 10.91) and a low negative trend within the intervention phase (slope = $-1.11$). A small positive trend was revealed from the baseline to the follow-up phase (slope = 0.61). In general, these results represent an overall trend reversal. The stability of data based on a criterion of plus or minus 50% of the mean showed the data values to be stable during the maintenance and follow-up phases. The baseline and intervention phases showed variability in data.

**Waiting to Respond**

Figure 3 summarizes the data point values measuring the participant’s waiting to respond behavior. During the baseline, eight data points were collected on the percentage of participant’s waiting to respond to the number of opportunities given for directions, feedback or criticism by a supervisor or co-worker ($M = 19.79\%$). During the intervention phases, 30 data points were collected ($M = 56.39\%$). In the maintenance phase, two data points were collected ($M = 100\%$), and during follow-up, two data points were collected ($M = 100\%$).

Large gains in the mean levels of the participant’s waiting to respond behavior, shown in Figure 3, occurred between the baseline and the maintenance phase (80.79%) and the baseline and follow-up phase (80.79%). Moderate gains occurred between the intervention and the maintenance phases (43.61%), and
between the baseline and intervention phases (36.60%).

A best-fit-line approach (least squares regression) to estimating trends in the slope of the data within and between phases found moderately high positive trend within the initial baseline phase (slope = 6.05) and a small positive trend within the intervention phase (slope = 1.40). A small to moderate positive trend was revealed from the initial baseline to the intervention phases (slope = 1.67). A small to moderate positive trend was revealed from the baseline to the follow-up phase (slope = 1.89). These results demonstrate an overall reversal in trend, as well as small to moderate gains in this target behavior. The stability of data based on a criterion of plus or minus 50% of the mean found the data values to be stable during the maintenance and follow-up phases. The initial baseline and intervention phases showed variability in data.

Appropriate Verbal Response to Directions, Feedback, or Criticism

The data point values measuring the appropriate verbal response behavior are shown in Figure 4. During baseline, eight data points were collected on the percentage of appropriate verbal responses to opportunities to respond to directions, feedback, or criticism from a supervisor or co-worker during 10-minute sessions ($M = 0\%$). During the interventions, 29 data points were collected ($M = 34.44\%$). For the maintenance phase, two data points were collected ($M = 100\%$) while during the follow-up phase, two data points were also collected ($M = 87.50\%$). The percentage of appropriate verbal response with slope line is shown in Figure 4.

As shown in Figure 4, large gains in the mean levels of appropriate verbal response were found between the baseline and the maintenance phases (100%) and the baseline and follow-up phase (87.50%). A best-fit-line approach (least squares regression) to estimating trends in the slope of the data within and between phases found high positive trends between the initial baseline (slope = 0), and the maintenance (slope = 9.70) and follow-up phases (slope = 8.64). On the other hand, a more moderate positive trend was found between the baseline (slope = 0) and
intervention phases (slope = 2.13). In sum, these findings show clear reversals in trends, as well as, consistent gains from baseline to the follow-up phase (slope = 3.00), and from the intervention phase extending to the follow-up phase (slope = 2.37).

The stability of data based on a criterion of plus or minus 50% of the mean found the data values to be stable during the initial baseline, maintenance, and follow-up phases. The intervention phases showed variability in the target behavior data. There were adequate lengths of data points collected across all phases of this behavior, and those described above. One possible explanation for increased variability in data may be that the data points represented percentages. Using the multiplier of 100%, may have expanded the range of data by a factor of 100, thus increasing the overall variability. Additionally, this outcome was represented in the other target behaviors previously described.

Social Validity Data
The social validity data from the pre- and post-intervention questionnaires (answered by one supervisor and two co-workers) were collected and analyzed using both quantitative as well as qualitative measures, such as content analysis (Kennedy, 2005). Results suggested the respondents perceived that the social skill target behaviors were improved following intervention. According to the anonymously answered questionnaires (N = 3), the participant’s abilities to learn new tasks easily and to accept verbal directives were rated as 30% higher post-intervention. The participant’s ability to accept feedback was rated as 20% higher post-intervention, and her ability to accept criticism was rated as 7% higher post-intervention. However, some concerns about the participant’s discussion of personal topics during work continued to be an issue of need in the workplace as indicated by written responses to the survey’s open-ended question.

Discussion
The present study used a structured role playing strategy that supported the promotion of self-management skills for improving the social skills of a young woman with moderate
intellectual disability working as a volunteer in a community child care setting. The results revealed improvement in all target social behaviors and a perceived positive change in the participant’s work performance involving these skills by her supervisor and co-workers after the study was concluded. Analyses showed a clear trend reversal in the data when baseline and post-intervention phases were compared. Specifically, the study found that this type of training protocol which was given outside the immediate workspace, was efficacious in training the following prosocial behaviors: (a) establishing and maintaining eye contact with adults during conversation, and directions, feedback, or criticism, (b) waiting to respond until adults were finished speaking, and (c) giving appropriate verbal response to directions, feedback, or criticism from a supervisor or co-worker.

Results of this study are consistent with previous research (Ganz & Sigafoos, 2005) that found that teaching self-management skills to young adults with intellectual disabilities could promote the use of cognitive strategies which students appeared to be able to use independently at a later time to increase target trained behaviors. The role-playing and focused instruction of the training protocol had four components which appeared to have positively influenced the outcomes of this study. First, the training protocol relied heavily on encouraging the participant to use cognitive strategies to think about the behaviors she was attempting to learn and how those new responses might impact those around her. She was required to tell the trainers how she would feel if someone displayed the target behavior with her and how she felt when she displayed them. Because the participant’s communication skills were good, this strategy appeared to be a reasonable and effective choice for her. This technique also appeared to reinforce for the participant that she did indeed have control over these behaviors herself. However, informal discussion with the participant’s supervisor and informal observations of the participant following the study suggested that she continued to have some difficulty recognizing that she needed to use the target behaviors with co-workers, especially when co-workers were close in age to the participant and she viewed them as a peer.

Second, the training placed an emphasis on developing the skills that were described to the participant as those that “professionals use.” That is, during training the trainer might say something like: “Professionals keep their eyes on the person talking to them” when introducing and rehearsing this skill. Third, the participant was given a role-play sequence each training which varied in some way. In the role-play, the participant might first take her own role, and then assume the role of her supervisor. The repeated rehearsal of the target behaviors in a number of work-specific situations was undoubtedly useful for this participant. Situations which had already occurred (and she had reacted in a way that her supervisor communicated was inappropriate or unacceptable to the setting) were used. Additionally, the participant role-played situations that had not occurred but were likely to occur. These situations were recommended by her supervisor and/or co-workers. Every effort was made to keep the training as “authentic” as possible. As training progressed, the trainers gradually removed the number of verbal prompts offered to support the participant’s target behaviors. And fourth, the participant was very committed to continuing her work as a volunteer in the setting. Her personal desire may have strengthened the impact of the training.

The intervention data showed variability in the target behaviors that were measured, which may be partially due to changes in personnel assignments unique to this workplace setting. For example, the child care center used for this study setting is also a teacher-preparation practicum site that has a new cohort of teacher-candidates rotating through the classrooms on a bi-monthly basis. These personnel changes, while representative of real workplace situations, posed an additional challenge for the participant requiring her to interact with new people on a regular basis. The challenge posed by changes in personnel affecting variability in target behaviors would need to be addressed in future studies conducted at this child care center.

Although the data demonstrated considerable variability, there remained a clear trend toward acquisition of the target behaviors at the conclusion of intervention. In addition, target behaviors continued to occur at a rate
of 87%–100% of the time during observation sessions conducted during the maintenance and follow-up phases of the study, suggesting that the natural interactional consequences which the target behaviors tended to draw (such as smiles, words of thanks, and a decrease in criticism from the supervisor) were sufficient in maintaining these skills for the three months following training. The results of this study are promising in that they may offer professionals who support individuals with moderate intellectual disabilities an additional option for improving work-related skills without the potential intrusion and social dependence that may occur with the use of job coaches according to Mautz and colleagues (2001).

Of the target behaviors trained, eye contact during directions, feedback and/or criticism and providing appropriate responses seemed to be the most challenging for the participant. This too appears consistent with the evidence that task-oriented conversations are more challenging for individuals with intellectual disabilities than socially-oriented conversations (Hughes, Carter, Hughes, Bradford, & Copeland, 2002). But the reality is that any workplace presents a high rate of task-oriented conversations so potential workers must develop competence in managing this style of verbal interaction to be integrated successfully, particularly in community-based work sites. Similarly, the participant of this study appeared more at ease with socially-oriented conversations than task-oriented interactions. That is, she seemed to believe that if she used socially-oriented conversations, she was less at-risk for receiving nonpositive feedback on her work performance. Ironically, this is the opposite of the case in this work site and others.

Several limitations of the present study merit comment. First, only a small, discrete set of target behaviors were identified and trained. There were several other behaviors, such as child-directed conversations, that could have been addressed to maximize the participant’s job skill repertoire. Second, implementing the training fidelity proved to be a challenge at times. There were times in which the trainers found it difficult to bring the training back to the script when the participant asked a question that was relevant but not an assigned component of the training protocol. Third, the child care center used was established as a training site for pre-service teachers so it was equipped with observation rooms from which the observers could collect data unobtrusively. Others might find this impossible and may have to be visually available to the subject which may influence the outcomes. Fourth, as noted the participant had good communication skills, was a fairly independent worker, and may have required less direction from her supervisor and co-workers than others who may be classified with the same level of intellectual disability. This increase in independence frequently led to a decrease in verbal responding opportunities, and a number of observation sessions in which no opportunities were recorded. Consequently, these sessions were omitted from the reported data. A final limitation of the study was that the trainers and data collectors were the same individuals which exposed the study to the threat of researcher bias. However, when interrater reliability and fidelity of treatment were determined, two non-trainers were used.

Despite these limitations, the present single subject study demonstrates the efficacy of using a structured role playing training protocol outside the immediate workspace to promote the development of self-management skills and prosocial behaviors for improved performance in a workplace. Future research should replicate this study to help develop an evidence base for practical application, as well as extend it to include individuals with a variety of disabilities, such as autism to determine generalization of the training strategy. In addition, research in community settings that differ from this one would be useful. Recently, developing a community-based partnership involving employers, high schools, vocational training programs, and similar organizations has also been shown to improve work opportunities for youth with disabilities (Carter et al., 2009). As the hope for community-based work for individuals with intellectual disabilities increases, it becomes even more critical for professionals to identify time-effective methods to better support the work performance of these youth and adults.
References


Received: 8 September 2009
Initial Acceptance: 17 November 2009
Final Acceptance: 1 March 2010

Social Skills Training / 51
Correspondence between Video-Based Preference Assessment and Subsequent Community Job Performance

Robert L. Morgan and Erin L. Horrocks
Utah State University

Abstract: Researchers identified high and low preference jobs using a video web-based assessment program with three young adults ages 18 to 19 with intellectual disabilities. Individual participants were then taught to perform high and low preference jobs in community locations. The order of 25-min high and low preference job sessions was randomized. A third session allowed participants to choose which job they wanted to perform. Two data collectors, who were unaware of high and low preference jobs, recorded observations of on-task behavior. Using an alternating treatments design, researchers found participants (a) were engaged in tasks at generally higher rates on high preference versus low preference jobs, (b) usually selected high preference jobs in the choice session, and (c) identified high preference jobs as the favored one at the conclusion of the research. Results were consistent with selections on the video web-based assessment program.

Assessment of job preferences for individuals with significant intellectual disabilities is important for three reasons. First, it aligns with the philosophy of self-determination which states that an individual acts “as a primary causal agent in one’s life and (makes) decisions regarding one’s quality of life free from undue influence and interference” (Wehmeyer, 1996). Baer (1998) describes self-determination as presentation of two or more conditions with a request for a response to indicate the preferred one based on relative frequency of choice. Second, assessment of preferences is required by the Individuals with Disabilities Educational Improvement Act (IDEIA, 2004) which states that a student’s interests and preferences should be assessed in transition from school to adult roles. Third, working in preferred settings increases job performance (Bambara, Ager, & Koger, 1994; Parsons, Reid, Reynolds, & Bumgarner, 1990; Reid, Parsons, & Green, 1998). Parsons et al. assessed work preferences of four adults with developmental disabilities then arranged work on a high preference task, a low preference task, and a choice of tasks. Tasks included five woodworking activities in a sheltered workshop. Task preferences were assessed individually as researchers placed two tasks in the participant’s view, requested a choice, recorded responses, provided 10 min of work opportunity on the chosen task, and repeated the assessment. In subsequent work periods, researchers recorded participants’ on-task behavior. Using an alternating treatments design, high preference and choice tasks were associated with increased levels of on-task behavior compared to low preference tasks. Bambara et al. systematically replicated the Parsons et al. study with three adults with developmental disabilities and found similar results. In a second study, Bambara et al. found choice of task was associated with higher levels of on-task behavior than no choice.

Previous research in job preference has involved assessment and subsequent measurement of job performance on vocational tasks or portions of jobs (e.g., Mithaug & Hanawalt, 1978). Video-based job preference assessment may serve as an efficient and economical alternative prior to placing youth or adults into community employment. In recent years, three video-based assessments for individuals with intellectual disabilities have been re-
searched (Ellerd, Morgan, & Salzberg, 2006; Martin et al., 2005; Stock, Davies, Secor, & Wehmeyer, 2003). One assessment entitled Your Employment Selections (YES: Morgan, Ellerd, Gerity, & Tullis, 2001) presents 2–4 min of video on up to 120 different entry-level jobs identified as common placements for individuals with intellectual disabilities (Morgan, Ellerd, & Jensen, 2000). The video assessment program allows a participant to select preferred work conditions, and then watch video of jobs matching selected characteristics. The outcome is a list of five to eight preferred jobs to be used for (a) consideration by the job seeker and/or support team, (b) identification of training priorities, and (c) job development and placement. Ellerd et al. examined the correspondence between video job preferences and selections made after community tours of employment sites. The video assessment first identified one high preference and one low preference job followed by community visits to the same jobs. Results from 20 participants, ages 18–22 with intellectual disabilities, indicated 34 of 40 jobs selected as preferred in the video CD-ROM program were selected as preferred after community visits.

Although previous research identified a relationship between preferences for video stimuli and preferences for community employment, it did not investigate the potential relationship between preferences and subsequent job performance. That is, the relationship between preference and job performance found in previous research (Bambara et al., 1994; Parsons et al., 1990) has not been examined with video stimuli and community jobs. There is a need to determine whether a video-based job assessment is predictive of high levels of performance on a job (e.g., engagement with the task, acceptable levels of productivity, increased production over time) because such an assessment may be useful in identifying preferred jobs for training and placement. However, given the complexity of community jobs, a highly preferred video may evidence no relationship to high job performance. Conversely, a low preference video may not predict low job performance. Individuals may respond to stimuli in actual job settings in ways that alter preferences and affect their performance of job tasks. Additionally, video selections may not predict future preferences after an individual has performed tasks related to the job. Research is needed to determine whether job preferences identified on video correspond with high levels of performance on the job. One way to investigate such a relationship is to examine differences in high and low preference job performance following video selection. The purpose of the present study was to investigate whether jobs identified as high and low preference in a video assessment were associated with high and low levels of performance on the jobs.

Method

Participants

Participants were three individuals participating in a post-high school special education program on a university campus. Goals and objectives in Individual Education Plans (IEPs) focused on developing employment-related skills.

Diego was an 18-year-old Hispanic male with Down Syndrome whose scores on the Leiter International Performance Scale (i.e., a nonverbal intelligence test) and Vineland Adaptive Behavior Scale indicated performance in the moderate range of intellectual disability. Diego verbally stated basic information (e.g., first/last name, address, school), read 2nd grade sentences at 60 words per minute, and identified the value of common coins and bills. He performed one-digit addition/subtraction. Diego’s employment training experience included performing tasks for two hours per day for 12 weeks in a kitchen (food preparation) and a department store (stocking).

Kyle was an 18-year-old male with Williams Syndrome whose intelligence and adaptive behavior scale scores indicated performance in the moderate range of intellectual disability. Kyle verbally identified simple one and two-syllable words, sounds corresponding to letter names, and names of letters. He verbalized numbers up to 20, identified numbers corresponding with up to 20 objects, and physically grouped objects by size. Kyle’s employment experience included part-time training in a fast food restaurant (cleaning tables), kitchen
Tasha was a 19-year-old female with mild cerebral palsy whose intelligence and adaptive behavior scale scores indicated performance in the mild-to-moderate range of intellectual disability. Tasha read newspaper articles, used a calculator to add/subtract, verbally identified clock time to 5-min increments, and spoke in complex sentences. Her employment experience included part-time training in a bus garage (washing vehicles), retail store (cleaning surfaces), and elementary school (making materials for student activities). She received daily medication for agitation, depression, and anxiety.

These participants were selected because of nomination from their post-high school teacher indicating they (a) verbally identified preferences, (b) possessed adequate expressive and receptive English language, (c) demonstrated basic vocational skills, and (d) attended on a regular basis.

Settings

Video preference assessment. Individual participants and one of the researchers met in a 5 m by 4 m office on a university campus to conduct the assessment. The room included a desk, chairs, and laptop computer with Internet access.

Job locations and tasks. Settings and tasks included (a) stocking candy at a supermarket in a shopping center, (b) cutting 22-gauge phone wires at an assistive technology lab on a university campus, (c) restocking DVDs at a video rental center, (d) sorting bolts, screws, nuts, washers, and other items at an agricultural systems technology center, (e) feeding chickens and other animals, brushing horses, and cleaning facilities at a farm; and (f) dusting/sweeping shelves and recreational vehicles at a repair facility. All jobs were in integrated community settings.

Procedure

This study began with a video preference assessment session with each participant. Participants then performed high and low preference job tasks in community locations. The study concluded with a brief interview of each participant. All sessions were conducted with individual participants. Procedures are described below.

Video preference assessment. The first author administered the video assessment to individual participants to identify high preference jobs. At the beginning of the session, the first author stated:

This is a web site that shows video of jobs. We are going to pick jobs you are interested in and jobs you are not interested in. This is not a test; it’s just a way to find out more about jobs and what you like. It takes about an hour. We can take a break at any time.

The program presented four screens, each with four icons representing types of work and job tasks (e.g., automotive, computer use, retail sales). Participants selected individual icons representing types of preferred work tasks. Given four screens with four icons each, up to 16 icons could have been selected. A computer program matched tasks to jobs based on information from O*Net (Department of Labor, 2008). The program recorded jobs associated with each selected icon. Jobs associated with all combined icons were then listed (e.g., automotive + computer use + retail = auto parts sales person). Participants then watched 2–4 min of video on these jobs. The videos showed actual employees performing jobs in community settings. After watching the video, a selection screen appeared. On the selection screen, the participant pressed a “thumbs up” button to retain the job or a “thumbs down” button to discard it. A “More Information” link was available if the participant wanted additional job-specific data such as training, qualifications, typical wages, and other factors. If requested by the participant, the researcher read information from the “More Information” page. The outcome was a list of retained jobs (out of 120 possible jobs). If more than three jobs were retained, the researcher presented side-by-side screens showing the opening video frame of two jobs and asked “Which one do you like better: (Job A) or (Job B)?” The participant could choose Job A, Job B, or both. The researcher proceeded through pairs of jobs in randomized order. The process continued until all jobs were discarded except for three. The three
remaining jobs were assumed to represent high preference ones.

In a separate session on a different day, the researcher met with individual participants to identify low preference jobs. The session was conducted in a manner similar to the high preference session, except the researcher stated:

This time, identify jobs you are not interested in. Show me the jobs that you would not want to do.

The outcome was a list of three low preference jobs. Sessions lasted 20 to 40 min.

Identification of community locations for high and low preference job tasks. Using the lists of three high and three low preference jobs for each participant, researchers contacted community employers to request opportunities to perform job tasks. The research was described and employers were assured that participants would be supervised. Employers were told the work sessions were for the purpose of “providing individuals the opportunity to perform jobs in community settings.” Given agreement by employers, one high preference job site and one low preference job site was established for each participant.

Pre-assessment. Prior to the first session, researchers conducted a brief assessment at each job site. After the researchers set up tasks and an informal task analysis listing steps to be performed, researchers observed as each participant carried out the primary tasks of each job. Researchers scored performance on each step as independent or requiring a prompt. If a prompt was required, researchers repeated the pre-assessment process. All participants performed steps independently prior to the first session of job performance.

Job performance assessment. Two data collectors, unaware of participants’ preferences, recorded performance at job sites. The primary data collector recorded participant performance, wrote narrative notes, and organized files. The secondary data collector drove the vehicle to community jobs, developed the job tasks, and served as inter-observer agreement recorder. The first author checked procedural fidelity. The second author scheduled work sessions at each site. The daily schedule consisted of three 25-min sessions at job sites: (a) high preference, (b) low preference, and (c) participant choice. Job sites were randomly assigned to first, second, or third sessions to avoid sequence effects. On the first day, the “choice” session was scheduled last so that participants first received experience working at the other two job sites. Data were collected on on-task performance and choice of job using procedures described below.

Dependent Variables

On-task performance was defined as engagement in activities necessary to complete the job task, such as manipulating or making eye contact with materials, physically positioning oneself in the assigned work location or walking to the location, asking questions of the secondary data collector or employer regarding the task, or receiving instruction from the secondary data collector or employer regarding the task.

Choice of job was defined as a response to the question “Which one (job) do you want to do?” when presented with two 3 cm by 5 cm cards showing photos of each job. Participants responded by verbally identifying or pointing to one particular photo. The secondary data collector presented photos for choice making while in the vehicle, not at a job site. Additionally, the secondary data collector asked each participant two questions following the last session: (a) “which job did you like best” and (b) “which job did you do (perform) best”?

Job Performance Procedures

Data collectors received the schedule of jobs upon arrival at the post-high school location each day. They were instructed to avoid conversation with participants about job preference or performance, but instead, to talk about other topics. Upon arrival, one data collector verbally identified for the participant the job to be performed and the name of the business or organization. For example, the data collector stated “this is the stocking clerk job at XYZ Supermarket.” Additionally, the data collector presented the photo card of the job to associate the card with the task. After greeting the employer and arranging the job task, the secondary data collector delivered the following instruction to the participant:
Here’s the job called (job name). Please start the job now. Do it yourself. Start work now and keep working until I tell you to stop. If you want to take a break, let me know by saying “I need a break please.” If you want to stop working, let me know by saying “I want to stop.” Any questions?

In anticipation that some participants may request to stop work, researchers arranged performance of math worksheets as “neutral tasks” for the remainder of the 25-min work period. The rationale for this procedure was that although work on a job task could be escaped, other forms of work (math) would be substituted and carried out in the same location. Data collectors gathered worksheets from the teachers representing previously mastered math lessons and made them available after work was stopped. Participants filled out the math worksheets in the vehicle at the site where work was stopped.

The secondary data collector served as a job coach supervising work while the primary data collector recorded performance. Food, drinks, and music were not available during work sessions, however, they were offered en route between jobs. For outdoor jobs, a coat and gloves were available to participants upon request. After 25 min, the job coach stopped the work session and the group traveled to the next job site or returned to the post high school.

Research Design

An alternating treatments design (Cooper, Heron, & Heward, 2007) was used to investigate the effects of high and low preference video selections on job performance and choice of job. This design is one type of single-subject design involving rapidly alternating exposure to different treatments (i.e., high and low preference jobs) to determine whether differences emerge in the dependent measure (i.e., on-task behavior).

Response Measurement

Data collectors received eight hours of training from the researchers by discussing definitions of on-task performance, observing simulations, and recording behaviors of employees in community job settings.

On-task performance. Data collectors used signal devices to record momentary time samples of on-task behavior at 30 s intervals on a fixed schedule. The signal device was concealed in a pocket of clothing. On/off task behaviors were recorded on data sheets and compiled to produce percentage of observations with on-task behavior.

Inter-Observer Agreement

Interobserver agreement (IOA) required that both data collectors carry signal devices and simultaneously record on-task or off-task performance. IOA recording was conducted in 33.8% of total sessions and was computed as the percent of agreements (i.e., on or off task) divided by agreements plus disagreements times 100. An “interval-by-interval” computation was used, i.e., the observers’ records were compared for each interval. IOA for on-task performance was 94.8% (Diego=91.1%, Kyle=99%, Tasha=93.8%) and ranged from 81.8% to 100%.

Procedural Fidelity

Researchers recorded whether the job coach adhered to a set of procedures in carrying out work sessions, including the following: (a) maintained daily schedules within 10 min, (b) carried out transportation without discomfort to the participant, (c) accurately read a script to start work and identified each job for the participant, (d) accurately read a script if a participant asked to stop work, (e) accurately read a script to present the choice session and displayed the two photo cards, (f) arranged the chosen work, (g) intervened when work stopped due to participant request for assistance or a question about the task, (h) refrained from praise statements or recognition of work accomplished, and (i) offered prompts only when the participant requested and used the least prompt necessary. Scoring each item “yes” or “no,” the first researcher recorded procedural fidelity in 18 of 71 total sessions (25.3%). Overall procedural fidelity was 95.5%, ranging from 67% on “refrained from praise statements” to 100% on most other procedures.
Results

Video job preference assessment results for Diego indicated the high preference job was stocking candy in a supermarket and the low preference job was electrician, i.e., cutting wires. Figure 1 presents on-task performance for Diego across high and low preference jobs. In all 10 choice sessions, Diego selected the high preference job. On-task performance at the high preference job ranged from 72% to 96% (Mean = 87.4%). On-task performance at the low preference job ranged from 29% to 90% (Mean = 63.9%). Choice session performance ranged from 80% to 98% (Mean = 88.9%). Four data points for low preference sessions overlapped the lowest data point for high preference sessions. The last three high preference sessions were higher than low preference sessions. The data collector noted Diego occasionally had difficulty locating items in the supermarket candy display and would ask for help. At the conclusion of research, Diego identified the high preference job as the one he liked better and the one he performed better.

Video job preference assessment results for Kyle indicated the high preference job was stocking videos in a video rental center and the low preference job was sorting objects. Figure 2 presents on-task performance for Kyle across high and low preference jobs. Four choice sessions were conducted at the high preference site; four were conducted at the low preference site. Three of the first four

Figure 1. Percentage of observations on-task for Diego in high preference (supermarket), low preference (AT lab), and choice conditions.
choice sessions involved selection of the high preference job, while three of the next four choice sessions occurred at the low preference job. On-task performance at the high preference job ranged from 96% to 100% (Mean = 98.8%). On-task performance at the low preference job ranged from 45% to 100% (Mean = 73.4%). Three data points for low preference sessions overlapped the lowest data point for high preference sessions. The last five high preference sessions were higher than low preference sessions. Four choice sessions at the high preference job resulted in performance ranging from 80% to 100% (Mean = 94.5%). Four choice sessions at low preference job resulted in performance ranging from 62% to 98% (Mean = 89%). Generally, higher and more stable on-task performance was evidenced at the video rental center (high-preference job). The data collector noted that Kyle occasionally had difficulty locating videos in the display area. The video cases used at this rental center did not include graphics, only text, thus requiring Kyle to read and match text labels. Although he sometimes required considerable time finding video displays, he rarely asked for assistance. At the conclusion of the study, Kyle identified the high preference job (stocking videos) as the one he liked better but indicated he performed better at the low preference job (sorting objects).

Video job preference assessment results for Tasha indicated the high preference job
was feeding animals at a farm and the low preference job was dusting shelves/vehicles at a recreational vehicle repair center. Figure 3 presents on-task performance for Tasha across high and low preference jobs. In all 5 choice sessions, Tasha selected the high preference job. On-task performance at the high preference job ranged from 92% to 98% (Mean = 95%). On-task performance at the low preference job was 38% on Session 2. After Session 2, Tasha refused to work at the low preference job, stating “it gives me headaches” or “the dust makes it so I can’t breathe.” In Session 4 at the low preference job, the secondary data collector encouraged Tasha to “try dusting for 10 min” and gave her a dust mask. Subsequently, she dusted shelves for approximately 10 s but then refused to continue. The same request and refusal were repeated in each successive session. Upon refusal, Tasha and data collectors returned to the vehicle in the repair center parking lot, where one data collector instructed Tasha to perform math worksheets for 25 min. The primary data collector recorded Tasha’s statements at the low preference job such as “get me out of here” and “I won’t even go in there” (the repair center). In contrast, statements at the high preference job included “I like working here” and “animals are fun.” Five choice sessions at the high preference job resulted in performance ranging from 86% to 92% (Mean = 90%). At the conclu-
sion of research, Tasha identified the high preference job as the one she liked better and the one she performed better.

Discussion

Results of this study indicate jobs identified as high and low preference in a video assessment were generally associated with high and low job performance, respectively. To this extent, results were similar to those reported in previous research (Bambara et al., 1994; Parsons et al., 1990; Reid et al., 1998). However, job performance relative to preference varied across participants. Diego performed at relatively high levels of on-task behavior and chose the high preference job at each opportunity. Kyle performed at relatively high levels of on-task behavior with fair consistency on the high preference job, but when given a choice, selected the low preference job as many times as the high preference job. Data collectors and researchers noted that Kyle appeared highly challenged by the requirements of the high preference job (video stocking). Tasha performed at a high level of on-task behavior in the high preference job and refused to perform the low preference job after the first session. Although her preference was clear from her remarks, her refusals prevented comparison of on-task behavior across settings.

Results in this study must be considered in the context of at least two limitations. First, measures of productivity on the job were not recorded. Productivity in community employment settings may be more important than on-task behavior because it assesses work completion rate comparable to other employees. Measurement of productivity on high and low preference jobs was not undertaken in this study. Defining productivity will require addressing company or industry standards or employer expectations. Future researchers should include measures of productivity and determine if productivity increases as preference increases. Second, the pre-assessment in this study needed to be more extensive. In the current study, researchers conducted only a cursory assessment of job tasks and did not perform a comprehensive measurement of all tasks without prompts, nor did they consider a large sample of situations that might be encountered on jobs by participants. In the absence of comprehensive pre-assessment, highly challenging situations encountered on jobs may compete with previously identified preferences to produce a confounding variable affecting job performance.

Both Diego and Kyle appeared highly challenged by their high preference job tasks. High preference jobs that are complex and highly challenging produce three issues. First, the video assessment must present the expected rate of task performance by a video model. Speed and accuracy of performance must be clearly demonstrated. Second, an estimate of the extent to which a participant’s performance matches the expected rate of task performance should accompany job preference assessment. Following this research, a job-matching component was added to the video assessment program (Morgan, 2008). Although future research is needed, a combination of preference plus matching assessment may be an accurate predictor of job performance. Fourth, although a job may be chosen from a video assessment as highly preferred, preference may change over time as a function of demands of the work environment. Job preference is likely to be a variable that fluctuates depending on degree of difficulty, duration of the session, probability of solving a problem, and other factors. These issues should be defined and investigated in future research.

Results of this study provide evidence that video assessment used to identify high and low preference jobs may, to some extent, correspond with subsequent job performance. Although results were variable and limited to three participants, the present findings support the need for future research on video assessment of job preferences. If preference for certain jobs can be ascertained from a video assessment and if preference affects performance as suggested by current results, transition teachers and rehabilitation counselors may use such a program as an efficient alternative to placement in community job samples or other methods.
References
Individuals with Disabilities Education Improvement Act of 2004, H.R. 1350-162.

Received: 4 June 2009
Initial Acceptance: 10 August 2009
Final Acceptance: 7 October 2009
A Meta-Analysis of Peer-Mediated Interventions for Young Children with Autism Spectrum Disorders

Jie Zhang
The College at Brockport, SUNY

John J. Wheeler
Western Michigan University

Abstract: This meta-analysis investigated the efficacy of peer-mediated interventions for promoting social interactions among children from birth to eight years of age diagnosed with ASD. Forty-five single-subject design studies were analyzed and the effect sizes were calculated by the regression model developed by Allison and Gorman (1993). The overall effect sizes suggest that peer-mediated interventions were highly effective. Further categorical comparisons suggest that these interventions were more effective in enhancing social responses in younger boys, when older male siblings served as interventionists, when the interventions took place in the home, when peer modeling was used, and when consideration was given to maintenance and generalization across participants, behaviors and activities, and in involving collaboration among all researchers, peers/siblings, school staff, and parents/families.

Evidence-based practice in the education and treatment of children and youth with autism enables special education professionals to validate their practices in accordance with the existing body of scientific evidence found in the literature (Wheeler, 2007). Yet this is a challenge for the field given the heterogeneity of the participants and the varying educational contexts that serve children diagnosed with Autism Spectrum Disorders (ASD) (Odom et al., 2005; Wheeler). Given that the prevalence of ASD is increasing at a dramatic rate, and that social interaction is a core deficit associated with ASD, the urgency for validating evidence-based practice in the study of social competence among young children with autism is critically important. The field of special education has embraced the concept of evidence-based practice yet researchers and practitioners have failed to operationalize this construct within the practice of research and delivery of educational services and supports. Thus, it is vital for professionals to systematically synthesize extant research within an evidence-based framework, so that basic and applied research can be translated to applied practice to better assist practitioners in the design and delivery of efficacious interventions and supports to children with ASD and their families (Wheeler).

Evidence-based Practices

The gap between research to practice in the field of education has been a source of debate for many decades as policy makers have argued that many practices lack the empirical efficacy needed to substantiate their claim. The most recent legislation, the No Child Left Behind Act (NCLB), draws attention to the need for greater levels of accountability thus requiring teachers to use scientifically proven practices in their classrooms (Odom et al., 2005; U.S. Department of Education, 2003). In spite of this recent mandate, there continues to be a disparity within the field of special education as to the fidelity of how these practices are implemented within classrooms among learners with disabilities. This is perhaps due in part to the complexity of this field, including the variability of the participants and the varying degrees of educational

Correspondence concerning this article should be addressed to Jie Zhang, Education and Human Development, The College at Brockport, State University of New York, 350 New Campus Drive, Brockport, NY 14420. E-mail: jzhang@brockport.edu
contexts that serve children with disabilities (Odom et al.; Wheeler, 2007). Odom and colleagues assert that the field of special education needs to develop specific guidelines for specifying types and levels of evidence needed to identify a practice as evidence-based and effective. These have yet to be fully operationalized in the literature. Until professionals have agreed on standards for determining evidence-based practices there will continue to be problems caused by misinformed practice. Researchers can assist in minimizing these irregularities through the systematic synthesis of extant research to ascertain the existing knowledge base and the gaps that exist between research and practice (Odom et al.; Wheeler). Furthermore, the knowledge from the current literature can be used to inform practice and scientifically proven evidence can be adopted as the appropriate basis for selecting these practices (Odom et al.).

Meta-Analysis for Single-Subject Studies

Single-subject research is a rigorous, scientific methodology used to define basic principles of behavior and to establish evidence-based practices by documenting functional relationships between independent and dependent variables (Horner et al., 2005). It provides systematic and detailed analysis of individuals and has proven especially relevant for defining educational practices at the individual learner level (Horner et al.). Thus, it plays an important role in identifying evidence-based practice in the field of special education. However, the criticism often leveled against single subject methodology is that the sample sizes used in these studies are often too small to be generalized to a larger population (Wellen, 1998). Synthesis of single-subject studies is one way to overcome this generalization problem since the procedures help determine whether a specific intervention is consistently effective in the change of the target behavior(s). In addition, if employed appropriately, the information from the synthesis of single-subject studies can contribute potentially to the field of special education (Scruggs, Mastropieri, & Casto, 1987).

Meta-analyses for single-subject studies can be used to develop guidelines for evidence-based practice and to design new studies because of the following reasons: (a) The aggregation of findings from a large number of single-subject studies can get a large enough sample to strengthen the conclusions about the practical implications to practitioners (Gingerich, 1984). (b) Information is taken from graphs and an unbiased synthesis of the empirical data can produce a more accurate estimation of the impact of the intervention (Davies & Crombie, 2001; Wellen, 1998). (c) The compilation of findings can identify factors contributing to the effectiveness, so that an intervention can be tailored more specifically to the unique characteristics of the participants and situation (Gingerich; Wheeler, 2007). (d) The method of coding can point up the failure to report some important variables in some studies (White, Rusch, Kazdin, & Hartmann, 1989) and also identify gaps in the existing research literature (Wheeler).

Autism Spectrum Disorders

Perhaps the greatest area of need for conducting such critical analyses of existing research lies in the area of ASD due to its dramatically increasing prevalence. Once believed to be a low-incidence disorder, ASD was estimated to occur in 4–5 children out of 10,000 prior to 1985 (Byrd et al., 2002). However, it is far more common than previously thought. It was estimated that the prevalence of ASD increased approximately four times in one decade, from 1 in 1,333 children (7.5 per 10,000 children) among children born in the mid-1980s to 1 in 323 children (31.2 per 10,000 children) among children born in the late-1990s (California Health and Human Services Agency, 2003). In 2004, the Department of Health and Human Services and the American Academy of Pediatrics issued an “Autism ALARM” claiming that 1 in 166 children (60 per 10,000 children) had ASD. Nowadays, the prevalence rates of children with ASD have reached 1 in 150 children (66 per 10,000 children) (Centers for Disease Control and Prevention, 2007). Accordingly, the number of children receiving services for ASD is reportedly on the rise. ASD is now recognized to be more prevalent in childhood than diabetes, cancer, spina bifida, and Down syndrome (Filipek et al., 1999).

Given that the prevalence of ASD is increas-
ing at a dramatic rate, the urgency for validating evidence-based practice is critically important. One area of vital importance is social competence. Since social interaction is a core deficit associated with ASD, requests on the effectiveness of the interventions aimed at increasing social interactions among young children with ASD have been quite striking (Goldstein, 2002). There is, however, a question on whether professionals have enough data to validate their practices as effectiveness (Wheeler, 2007). Furthermore, challenges exist in the implementation of evidence-based practice concerning the service for children with ASD because of: (a) the irregularities in the ability of special education to adopt the evidence-based practice, (b) a broad range of practices across educational settings exists in the delivery of services to these children including those which are not evidence-based, untested, ineffectual, and sometimes even harmful practices (Bellini & Akullian, 2007; Wheeler), (c) the heterogeneity of the participants and the educational contexts that serve these children, and (d) limited sample size resulting in an inability to generalize findings (Wheeler). As a result, there is an urgent need for meta-analyses of the existing literature on the effectiveness of various treatments for children with ASD, in this case interventions directed towards increasing social competence in young children with ASD.

Peer-Mediated Interventions for Children with Autism

Peer-mediated interventions provide typically developing peers with such activities as social skills training, prompts and praise in social play situations which are designed to model, reinforce, and promote appropriate social interactions and social skills for children with disabilities (McConnell, 2002). In peer-mediated interventions, adults may facilitate and monitor the intervention from close by although they never intervene directly with the target children (Odom & Strain, 1984). Unlike adult-mediated approaches, peer-mediated interventions facilitate learning in natural social contexts with peers or siblings by precluding the additional steps required to transfer learning from adults to peers in natural social contexts (McConnell).

Utley, Mortweet, and Greenwood (1997) classify peer-mediated interventions into six categories. They state that peer-mediated interventions consist of (a) peer modeling, (b) peer initiation training, (c) peer monitoring, (d) peer networking, (e) peer tutoring, and (f) group-oriented contingencies. Peer modeling includes peer-proximity and peer-pairing, which rely on the inclusion of a socially competent peer to demonstrate appropriate behavior for a child with ASD to imitate. Peer modeling also includes video modeling, which shows a video with a socially competent peer teaching appropriate behaviors to a child with ASD (Utley et al.). Peer initiation training typically requires a teacher to train peers how to evoke and maintain desired social behaviors from a child with ASD by establishing eye contact, suggesting play activities, initiating conversation, offering or asking for help, describing ongoing social interactions, expanding the content of the target child's speech, or demonstrating affection (Utley et al.). Peer monitoring uses a buddy system or role-playing to minimize teachers' disciplinary and supervisory responsibilities. With peer monitoring, children with ASD are taught to function independently from teacher's monitoring and management (Utley et al.). Peer networking aims to create a support system of friends for children with ASD in a natural social context. Socially competent peers are instructed to prompt and encourage social responses from target children, in addition to model and reinforce appropriate social behaviors (Utley et al.). Peer tutoring uses peers as one-on-one teachers to provide individualized instruction, practice, repetition, and concept clarification. It is used to increase opportunities to respond, academic engagement, and relevant academic behaviors for specific academic tasks (Utley et al.). With group-oriented contingencies, peers are trained as social change agents in a natural educational environment. When working for a common goal or reward, children in groups provide one another with natural social prompts and consequences. They distribute points or reinforcers, record data, give instructions, impose contingencies, provide assistance through cooperative reinforcement contingencies, and earn reinforcers depending to some extent on their behavior (Utley et al.).
DiSalvo and Oswald (2002) point out that integrated play groups, peer buddy and peer tutoring, and group-oriented contingencies arrange the situation or contingencies, enhance the likelihood of attention to peer models from children with autism and thereby, promote peer interactions. Peer networks, pivotal response training, and peer initiation training teach peers specific social skills, and make it easier and more rewarding for peers to interact with children with autism (DiSalvo & Oswald). McConnell (2002) reviewed 55 experimental research articles on interventions to facilitate social interaction for children with autism younger than nine years of age through 2000. Among the 55 studies, about thirty peer-mediated interventions were reviewed: (a) interventions to increase peer social initiations, (b) interventions to increase social and communicative interactions, and (c) peer-mediated incidental teaching and more structured peer tutoring (McConnell).

Hwang and Hughes (2000) assessed 16 empirical studies from 1981 through 1997 to investigate the effects of social interactive interventions on early social communicative skills of young children with autism, aged two to twelve, by increasing their role as initiator of social interactions. Two studies used peer-mediated intervention. Results indicated prolonged social interactions (McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; Pierce & Schreibman, 1995) and increased engagement in joint attention (Hwang & Hughes; Pierce & Schreibman). Odom and his colleagues (2003) examined 37 single-subject design studies from 1990 to 2002 to investigate the scientific evidence of intervention effectiveness for young children with autism. As the result of this review, peer-mediated interventions were categorized as emerging and effective practices (Odom et al.).

The purpose of this study was to determine whether peer-mediated interventions were effective in improving the social interactions among young children with ASD. In addition, the study was to provide an analysis of the effects of the interventions by treatment variables: (a) target children’s characteristics; (b) interventionists’ characteristics; and (c) features of interventions. This study provides a better understanding concerning the utility of peer-mediated interventions among children under eight years of age, who were diagnosed with autism, for promoting social interactions. This study also refines evidence-based peer-mediated intervention practices for these children by providing detailed integrated findings through meta-analysis of individual single-subject studies.

**Method**

**Criteria for Inclusion**

Studies selected met six inclusion criteria as follows:

1. The study used peer-mediated interventions;
2. One of the purposes of the study was to enhance social interactions for children with ASD;
3. The target children were under eight years of age diagnosed with ASD;
4. The study employed single-subject designs that provided at least three data points for pre-intervention and three data points for post-intervention phases via detailed graphs;
5. Dependent variables included observed social interactions between young children with ASD and their peers; and
6. All the articles were published in peer-reviewed English language journals between 1977 and 2006.

**Search Procedure**

Searches were carried out to obtain articles for inclusion in this meta-analysis. First, an electronic search was conducted among all peer-reviewed English language journals published from 1977 to 2006 using ERIC and PsycINFO search database. With one keyword from each of the three categories, combinations of three keyword entries were used to select studies for the present meta-analysis: (a) autism, autistic; (b) social development, social interaction, social behavior, social competence, social skills, peer relationship, peer relation, socialization, friendship, friend; and (c) children, young children, early intervention. The total number of combined keyword sets was 60 (2x10x3).

The search process resulted 2,670 articles. After eliminating 2,045 duplicates and exclud-
ing all irrelevant articles (e.g., reviews and position papers), a total number of 94 studies were retained.

Second, a hand search started with journal articles published in 1977 or with the first issue if the journal was founded more recently. The journals included *Journal of Applied Behavior Analysis, Focus on Autism and Other Developmental Disabilities*, and *Topics in Early Childhood Special Education*. Additionally, relevant studies found in the reference section of the reviewed articles were located and chosen according to the selection criteria. The second search resulted in 45 articles, 118 children, 190 graphs of observations, and 6152 observation data points from 19 journals.

**Data Coding**

A coding sheet was developed and used during both the data coding and double-coding procedures by the two authors. Relevant data from each selected study were coded using a systematic set of rules and procedures across the following categories: (a) target children’s characteristics, including age, gender, and diagnosis; (b) interventionists’ characteristics, including relative age, gender, and relation with the target children; and (c) features of the interventions, including settings, intervention types, target behaviors, with the consideration of maintenance or not, with the consideration of generalization or not, length of intervention, intensity of intervention, and involvement of researchers, peers/siblings, school staff and parents/families. Length of intervention was calculated by the length of intervention per session multiplied by the total number of sessions, while intensity of intervention was calculated by the length of intervention per session multiplied by the number of sessions per week. If a study reported the actual length of the intervention, the data was recorded. If, however, the length of the intervention was not reported in a study, it was calculated by using the length of the observational sample from the graphs. Data were transferred from coding sheets to Excel and then SPSS data sheets.

**Inter-Rater Reliability**

Inter-rater reliability for the coding procedure was determined through double-coding by the two authors of this meta-analysis. Twenty studies (44%) from the selected articles were randomly chosen and independently double-coded by the secondary author, Professor of Special Education and the primary author’s doctoral advisor. Additionally, given the complex nature of Allison and Gorman’s (1993) regression model, inter-rater reliability for the effect sizes analysis was determined through independent calculation by the primary author’s colleague, a senior graduate student of Special Education. The regression model was initially reviewed and then the effect sizes were computed independently for all 45 studies. Inter-rater reliability was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplied by 100%. The mean inter-rater reliabilities were 97.6% for the coding procedure and 100% for the effect size calculation.

**Analyses of Data**

Descriptive data of the selected studies were analyzed by calculating both the frequency and percentage for each of the variables from the coding sheet. The percentages were calculated by dividing the number of items in a subset by the total number of items in that variable. The regression model refined by Allison and Gorman (1993) was used to calculate the effect sizes. That model was chosen because it accounts for the natural trend of change by time in observations, i.e., it takes into account improvement in the baseline phase to avoid overestimating the effects of treatment (Allison & Gorman). To produce an effect size that excludes any improvement that may occur without intervention, it uses the trend of baseline observations while adjusting the treatment observations by subtracting the predicted values from the actual values in the treatment. It also considers the need to represent negative effects with a negative value of the correlation. In addition, it addresses the problem posed by changes in level and slope that occur in opposite directions (Allison & Gorman; Wellen, 1998). Thus, if the trend toward improvement in the baseline phase increases in the treatment phase, or the upward sloping line in the baseline phase gets steeper in the treatment phase, the method...
considers that change and calculates a greater effect size, and vice versa (Wellen).

Each usable graph of every selected child in the included studies was analyzed:

1. AB designs: the observations in the baseline A were compared to observations in the intervention phase B;
2. A1B1A2 designs: only the observations in the first baseline A1 were compared to observations in the intervention phase B1;
3. A1B1A2B2 designs: only the observations in the first baseline A1 were compared to observations in the last intervention phase B2.

As Allison and Gorman (1993) state, typically, researchers terminate their first treatment B1 before achieving maximum effects with the concern that the behavior will not return to the baseline A1 if treatment is carried “too far.” Thus, the maximum effects attempt to be achieved in the last intervention phase B2. In addition, the second baseline A2 always returns to the first baseline level of performance. Accordingly, the comparison of A1 and B2 is thought to yield the most valid estimate of treatment effects (Allison & Gorman);

4. Multiple baseline designs across behaviors: only the graph with the social interactions with peers as the target behavior was used;
5. Multiple baseline designs across settings: all data points from all of the graphs were used;
6. Multiple baseline designs across participants: every young child with autism was regarded as a separate AB design;
7. Multiple probe designs: similar to the multiple baseline designs;
8. Baseline followed by alternating treatments designs, baseline followed by alternating treatments and a final treatment phase designs, and adapted alternating treatments designs: the observations in the baseline A were compared to observations in the peer-mediated intervention phase;
9. Simultaneous treatment designs: the observations in the baseline A were compared to observations in the peer-mediated intervention phase;
10. Changing criterion designs: only the observations in the first and only baseline A were compared to observations in the last intervention phase.

After collecting the data from each selected graph, the effect sizes were calculated. First, among all the selected graphs, the intervention effect sizes (IES) by the measure of frequency were calculated between the baseline phase and the intervention phase for each selected child in every included study. Then, the overall intervention effect size (OIES) for frequency was averaged based on the IESs of the individual target children. Similarly, the follow-up effect sizes (FES) and generalization effect sizes (GES) by the measure of frequency were calculated between the baseline phase and the follow-up phase, or between the baseline phase and generalization phase, respectively, for each selected child. The overall follow-up effect size (OFES) and overall generalization effect size (OGES) for frequency was averaged based on FESs and GESs of the individual target children in all selected studies. Likewise, OIES, OFES, and OGES by the measure of duration were averaged based on IESs, FESs, and GESs for duration of the individual target children. In addition, the intervention effect sizes (IES) for frequency due to each variable from the coding sheet were used to calculate for each child in every selected study for further categorical comparisons.

The effect sizes were weighted by the number of observation data points n in each graph (Wellen, 1998). When the predicted values went beyond the possible limits, they were set back at the natural limits (Campbell, 2003). For example, when the predicted values of frequency were negative, they were set at 0. Similarly, when the predicted values of frequency were above 100, they were set at 100. If two or more sets of data were collected for one child in a selected study, only the set with the largest number of data points was used to guarantee one effect size for each selected child and also to avoid the average of the effect sizes for the child. If one target child had more than one pair of largest number of
observation data points in the baseline and intervention phases, the pair was randomly chosen. For example, if the intervention used multiple baseline design across settings and was conducted for one child across three different settings with the same number of data points in the three baselines and the same number of data points in the three intervention phases, then the pair was randomly chosen. Furthermore, means and standard deviations were calculated, and the effect sizes over three standard deviations were eliminated as outliers.

The one-sample t test was used to determine whether or not the overall effect sizes were significantly different from zero. In addition, a one-way ANOVA was used to see whether there was any significant difference within different variables. Once statistical significance was found, multiple comparisons were conducted to determine whether there were significant contrasts. Effect sizes of this meta-analysis were defined according to Cohen’s d (1988) standard: (a) $ES = .2$ is considered as a small effect; (b) $ES = .5$ a medium effect; and (c) $ES = .8$ a large effect.

### Results

#### Articles Selected for Inclusion

The selected studies were published from 1978 to 2006. Among them, twenty studies (40%) were published between 1992 and 1997. Furthermore, the 45 studies selected in this meta-analysis were published in 19 journals. Twelve studies (26.7%) were published in the *Journal of Applied Behavior Analysis*, five (11.1%) in the *Journal of Autism and Developmental Disabilities*, and four studies (8.9%) in the *Journal of the Association for Persons with Severe Handicaps*. Table 1 presents the frequency and percentage of the selected studies published by journal.

#### Overall Effect Sizes

Table 2 presents the overall effect sizes. Results suggest that peer-mediated interventions for promoting social interactions among young children with ASD were highly effective; and this effectiveness lasted across time, different settings, participants, target behaviors, or activities ($p < .01$).

### Table 1

Frequency of Reviewed Articles by Journal

<table>
<thead>
<tr>
<th>Number</th>
<th>Journal</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Journal of Applied Behavior Analysis</td>
<td>12</td>
<td>26.7</td>
</tr>
<tr>
<td>2</td>
<td>Journal of Autism and Developmental Disabilities</td>
<td>5</td>
<td>11.1</td>
</tr>
<tr>
<td>3</td>
<td>Journal of the Association for Persons with Severe Handicaps</td>
<td>4</td>
<td>8.9</td>
</tr>
<tr>
<td>4</td>
<td>Autism: The International Journal of Research and Practice</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>Behavior Modification</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>6</td>
<td>Behavioral Disorders</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>7</td>
<td>Child &amp; Family Behavior Therapy</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>8</td>
<td>Focus on Autism &amp; Other Developmental Disabilities</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>9</td>
<td>Journal of Early Intervention</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>10</td>
<td>Journal of Positive Behavior Interventions</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>11</td>
<td>Topics in Early Childhood Special Education</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>12</td>
<td>Education and Training in Developmental Disabilities</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>13</td>
<td>Journal of Autism &amp; Developmental Disorders</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>14</td>
<td>Journal of Behavioral Education</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>15</td>
<td>Journal of Developmental and Physical Disabilities</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>16</td>
<td>Journal of Emotional &amp; Behavioral Disorders</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>17</td>
<td>Journal of Intellectual and Developmental Disability</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>18</td>
<td>Journal of Special Education</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>19</td>
<td>Journal of Speech, Language, and Hearing Research</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td>45</td>
<td>100</td>
</tr>
</tbody>
</table>
Analyses by Participants’ Characteristics

The total number of studies analyzed by the target children’s age was larger than 45 because some studies included children at different age level. Twenty-six studies included target children from 72 to 97 months (42.6%), while one study included a target child under three years of age (1.6%). Forty-four studies included boys as the target children (78.6%), compared to 12 studies that included girls (21.4%). Forty-four studies included target children diagnosed with autism (88%). No study included target children diagnosed with Rett Syndrome or Childhood Disintegrative Disorder (CDD). Interventionists’ age was coded relatively compared to the target children’s age. Twenty-one studies included interventionists older (32.8%). Eighteen studies did not specify the gender of the interventionists (35.3%). The majority of the selected studies \((n = 39)\) included peers as interventionists (84.8%).

The IES by age 0–35 months was not calculated due to the constant variables in the baseline phase. Since the number of data of the IES by autism was much larger than those of IES by Asperger’s or by PDD-NOS, these three IESs were not compared. Likewise, the IES by both siblings and peers as the interventionists was not compared due to the large difference between the number of data.

Results of the effect sizes suggest that peer-mediated interventions for promoting social interactions among young children with ASD were highly effective across target children’s: (a) age, (b) gender, and (c) diagnosis. They were also highly effective: (d) when having interventionists older, at the same age, or with the combined age levels; (e) across different genders of the interventionists; and (f) across different relation between the interventionists and the target children. The intervention was more effective (a) in younger children \((p < .01)\), (b) in boys \((p < .01)\); or if the interventionists were (c) older or at different age levels \((p < .01)\), (d) boys \((p < .01)\), and (e) siblings \((p < .01)\). Table 3 provides data related to the participants’ characteristics, such as the target children’s age, gender, diagnosis, in addition to the interventionists’ relative age, gender, and their relation with the target children.

**TABLE 2**

Overall Effect Sizes

<table>
<thead>
<tr>
<th>Overall Effect Sizes</th>
<th>(N)</th>
<th>(ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall IES for Frequency</td>
<td>1880</td>
<td>1.46**</td>
</tr>
<tr>
<td>Overall FES for Frequency</td>
<td>446</td>
<td>1.49**</td>
</tr>
<tr>
<td>Overall GES for Frequency</td>
<td>219</td>
<td>1.51**</td>
</tr>
<tr>
<td>Overall IES for Duration</td>
<td>401</td>
<td>1.27**</td>
</tr>
<tr>
<td>Overall FES for Duration</td>
<td>79</td>
<td>2.44**</td>
</tr>
</tbody>
</table>

Note: ** indicates \(ES\) is significantly different from 0 \((p < .01)\).

Analyses by Features of the Interventions

Twenty-two studies were carried out in integrated classrooms (44.9%), while one study was conducted in a clinical setting (2%). Thirteen studies used more than one intervention (27.2%). More than half of the studies \((n = 37)\) studied social interactions combined with both initiation and response (62.7%). Eighteen studies reported maintenance (38.3%), sixteen studies reported generalization across settings (23.8%), and all 45 studies (100%) carried out generalization across participants: some interventions were implemented to different target children, and others with different interventionists. Twenty-four studies reported generalization across behaviors (53.3%), twenty-one studies reported generalization across activities (46.7%), and more than a half of the studies \((n = 30)\) involved researchers, peers/siblings, and school staff in the intervention (63.8%). The length of intervention was calculated by the length of intervention per session multiplied by the total number of sessions. Twenty-one studies performed the intervention for less than one hour (22.6%) and another 21 studies between one and two hours (22.6%). The intensity of intervention was calculated by the length of intervention per session multiplied by the number of sessions per week. Thirteen studies performed the intervention less than half an hour a week (28.9%), while twelve studies did not specify the intensity of the intervention (26.7%).

The IES by clinics was negatively high. It could not, however, be generalized since only one study occurred in a clinical setting. There was no statistical significant difference be-
tween the efficacy with and without the consideration of generalization across settings ($p < .05$). The IES by the involvement of researchers, peers/siblings, and parents/families was not compared, due to the limited number of studies and limited number of observation data. All ten IESs by the intervention length were compared, and the IES by 7–8 hours duration was significant different from other IES ($p < .01$). When comparing continuously, however, there was no bivariate correlation between the IES and length of intervention ($p > .05$). Similarly, all six IESs by the intervention intensity were compared, and there were significantly differences between some of them ($p < .05$). There was, however, no bivariate correlation between the IES and continuous intensity duration ($p > .05$).

Results of the effect sizes by the characteristics of the interventions from this study suggest that peer-mediated interventions among young children with ASD were highly effective: (a) across the settings, except clinics; (b) across different intervention types except for peer networking; (c) for promoting social responses and social interactions; (d) whether or not with the consideration of maintenance; (e) whether or not with the consideration of generalization; (f) across different involvement of participants; (g) across different length of intervention except for 4–5 hours duration; and (h) across all the intensity of the intervention. Furthermore, the intervention was more effective if the intervention: (a) took place at home ($p < .01$); (b) used peer modeling ($p < .01$); (c) aimed to enhance social response ($p < .01$); (d) considered maintenance ($p < .05$); (e) considered general-

---

**TABLE 3**

Data Related to the Participants’ Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>N</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Children’s Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–35 months</td>
<td>1</td>
<td>1.6</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>36–59 months</td>
<td>20</td>
<td>32.8</td>
<td>758</td>
<td>1.78**</td>
</tr>
<tr>
<td>60–71 months</td>
<td>14</td>
<td>23.0</td>
<td>296</td>
<td>1.39</td>
</tr>
<tr>
<td>72–97 months</td>
<td>26</td>
<td>42.6</td>
<td>826</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Target Children’s Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>44</td>
<td>78.6</td>
<td>1635</td>
<td>1.53***</td>
</tr>
<tr>
<td>Girl</td>
<td>12</td>
<td>21.4</td>
<td>245</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Target Children’s Diagnosis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism</td>
<td>44</td>
<td>88.0</td>
<td>1778</td>
<td>1.46</td>
</tr>
<tr>
<td>Pervasive Developmental Disorder—Not</td>
<td>3</td>
<td>6.0</td>
<td>48</td>
<td>1.93</td>
</tr>
<tr>
<td>Otherwise Specified (PDD-NOS)</td>
<td>3</td>
<td>6.0</td>
<td>54</td>
<td>0.97</td>
</tr>
<tr>
<td>Asperger’s Syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interventionists’ Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Younger</td>
<td>10</td>
<td>15.6</td>
<td>226</td>
<td>0.17</td>
</tr>
<tr>
<td>Same</td>
<td>15</td>
<td>23.4</td>
<td>527</td>
<td>1.20</td>
</tr>
<tr>
<td>Older</td>
<td>21</td>
<td>32.8</td>
<td>618</td>
<td>1.80**</td>
</tr>
<tr>
<td>Combination</td>
<td>18</td>
<td>28.1</td>
<td>509</td>
<td>1.90**</td>
</tr>
<tr>
<td><strong>Interventionists’ Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>11</td>
<td>21.6</td>
<td>329</td>
<td>2.14**</td>
</tr>
<tr>
<td>Girl</td>
<td>9</td>
<td>17.6</td>
<td>289</td>
<td>1.36</td>
</tr>
<tr>
<td>Not Specified</td>
<td>18</td>
<td>35.3</td>
<td>684</td>
<td>1.63</td>
</tr>
<tr>
<td>Combination</td>
<td>13</td>
<td>25.5</td>
<td>578</td>
<td>0.93</td>
</tr>
<tr>
<td><strong>Interventionists’ Relation with the Target Children</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peers</td>
<td>39</td>
<td>84.8</td>
<td>1591</td>
<td>1.33</td>
</tr>
<tr>
<td>Siblings</td>
<td>5</td>
<td>10.9</td>
<td>273</td>
<td>2.16**</td>
</tr>
<tr>
<td>Combination</td>
<td>2</td>
<td>4.3</td>
<td>16</td>
<td>2.46</td>
</tr>
</tbody>
</table>

Note: ** indicates that all the effect sizes within the category are significantly different from each other ($p < .01$).
alization across participants, across behaviors, or across activities \((p < .01)\); and (f) involved all researchers, peers/siblings, school staff, and parents/families \((p < .01)\). Table 4 provides data related to the settings, intervention types, and target behaviors, maintenance, generalization, collaboration, the length and intensity of intervention.

**Conclusions**

A meta-analysis was conducted in 45 single-subject design studies from 19 journals between 1977 and 2006. The overall effect sizes suggest that peer-mediated interventions were highly effective among children under eight years of age diagnosed with ASD for promoting social interactions. Further categorical comparisons suggest that these interventions were more effective in enhancing social responses in younger boys, when older male siblings served as interventionists, when the interventions took place in the home, when peer modeling was used, and when consideration was given to maintenance and generalization across participants, behaviors and activities, and in involving collaboration among all researchers, peers/siblings, school staff, and parents/families.

**Limitations**

One limitation of the presented meta-analysis stems from the inclusion/exclusion criteria used to select the studies. Only the studies published in peer-reviewed journals were included. Accordingly, this meta-analysis was biased in favor of published research compared to unpublished studies. Horner, Carr, Strain, Todd, and Reed (2002) state that due to a potential bias imposed by publication procedures, studies with positive results are more likely to be published than studies without or with negative effects. Such practices lead to a possible inflated estimate of effect size represented by published studies (Horner et al.). Therefore, the submission and publication of studies with negative or ineffective findings should be encouraged.

Allison and Gorman’s (1993) regression model was used to perform this meta-analysis. The model accounts for the natural trend of change in baseline to adjust the treatment observations, so it may rely too heavily on the estimation of trends from the baseline phase. Thus, the method may lead to inaccurate calculations of effect sizes when the number of data points in baseline is limited (Wellen, 1998).

Cohen’s \(d\) standards were used to define the effect sizes of this meta-analysis. However, instead of within subject comparisons in single-subject design studies, they were meant for between group comparisons in group designs. In many meta-analyses using single-subject design studies, effect sizes usually occurred larger than those in group design studies. Thus, the interpretation of the results of this study may change if the standards of the effect sizes change.

Another limitation derives from the use of a ruler to measure data points from the selected graphs during the process of data collection. The value of each data point in some selected studies had to be estimated because the graphs were too small to read exactly. To make the process of meta-analyses more efficient and to obtain more accurate information, single-subject studies in the future should provide more complete information: the original data in the form of graphs and in numbers, the number of baseline and treatment observation data points, and a more detailed description of the intervention variables.

Even though the effect sizes suggested that the intervention was more effective if the interventionists were siblings of the target children and if the intervention took place at home, consideration should be given regarding the confound between the siblings as interventionists and home-based intervention, since most home-based interventions included siblings’ participation. For example, among the five studies which took place at home, only one child, Huang, in one study by Yang, Wolfberg, Wu, and Hwu (2003) had both peer and siblings as the interventionists. Similarly, among the five studies which siblings served as the interventionists, only one study by Baker (2000) took place in playrooms at the university instead of home. The other four studies took place at home while had sibling serving as the interventionists (Coe, Matson, Craige, & Gosse, 1991; Strain &
### TABLE 4
Data Related to the Features of the Interventions

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>N</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Setting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Class</td>
<td>22</td>
<td>44.9</td>
<td>987</td>
<td>1.13</td>
</tr>
<tr>
<td>Segregated Class</td>
<td>6</td>
<td>12.2</td>
<td>192</td>
<td>1.86</td>
</tr>
<tr>
<td>Home</td>
<td>5</td>
<td>10.2</td>
<td>197</td>
<td>2.23**</td>
</tr>
<tr>
<td>Clinic</td>
<td>1</td>
<td>2.0</td>
<td>19</td>
<td>-1.56</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>30.6</td>
<td>485</td>
<td>1.78</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer Modeling</td>
<td>6</td>
<td>12.8</td>
<td>127</td>
<td>3.16**</td>
</tr>
<tr>
<td>Peer Initiation Training</td>
<td>10</td>
<td>21.3</td>
<td>322</td>
<td>0.97</td>
</tr>
<tr>
<td>Peer Monitoring</td>
<td>3</td>
<td>6.4</td>
<td>204</td>
<td>1.45</td>
</tr>
<tr>
<td>Peer Networking</td>
<td>3</td>
<td>6.4</td>
<td>133</td>
<td>0.62</td>
</tr>
<tr>
<td>Peer Tutoring</td>
<td>3</td>
<td>6.4</td>
<td>50</td>
<td>1.37</td>
</tr>
<tr>
<td>Group-Oriented Contingency</td>
<td>9</td>
<td>19.1</td>
<td>435</td>
<td>1.00</td>
</tr>
<tr>
<td>Combination</td>
<td>13</td>
<td>27.7</td>
<td>609</td>
<td>1.89</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Initiation</td>
<td>13</td>
<td>22.0</td>
<td>265</td>
<td>0.71</td>
</tr>
<tr>
<td>Social Response</td>
<td>9</td>
<td>15.3</td>
<td>220</td>
<td>3.23**</td>
</tr>
<tr>
<td>Combination of Social Interaction</td>
<td>37</td>
<td>62.7</td>
<td>1395</td>
<td>1.33</td>
</tr>
<tr>
<td><strong>Intervention Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
<td>38.3</td>
<td>789</td>
<td>1.54*</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>61.7</td>
<td>1091</td>
<td>1.41</td>
</tr>
<tr>
<td><strong>Intervention Generalization Across Settings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>34.8</td>
<td>577</td>
<td>1.37</td>
</tr>
<tr>
<td>No</td>
<td>30</td>
<td>65.2</td>
<td>1303</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Intervention Generalization Across Participants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45</td>
<td>100.0</td>
<td>1880</td>
<td>1.46**</td>
</tr>
<tr>
<td>No</td>
<td>30</td>
<td>65.2</td>
<td>1303</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Intervention Generalization Across Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24</td>
<td>53.3</td>
<td>954</td>
<td>1.76**</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>46.7</td>
<td>926</td>
<td>1.16</td>
</tr>
<tr>
<td><strong>Intervention Generalization Across Activities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>46.7</td>
<td>986</td>
<td>1.67**</td>
</tr>
<tr>
<td>No</td>
<td>24</td>
<td>53.3</td>
<td>894</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Involvement of Researchers, Peers/Siblings, School Staff and Parents/Families</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Researchers &amp; Peers/Siblings</td>
<td>7</td>
<td>14.9</td>
<td>186</td>
<td>1.98</td>
</tr>
<tr>
<td>Researchers &amp; Peers/Siblings, &amp; School Staff</td>
<td>30</td>
<td>63.8</td>
<td>1376</td>
<td>1.31</td>
</tr>
<tr>
<td>Researchers &amp; Peers/Siblings, &amp; Parents/Families</td>
<td>2</td>
<td>4.3</td>
<td>57</td>
<td>0.65</td>
</tr>
<tr>
<td>Researchers &amp; Peers/Siblings, School Staff, &amp; Parents/Families</td>
<td>8</td>
<td>17.0</td>
<td>261</td>
<td>2.06**</td>
</tr>
<tr>
<td><strong>Length of Intervention (minutes)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10–60</td>
<td>21</td>
<td>22.6</td>
<td>443</td>
<td>1.75</td>
</tr>
<tr>
<td>61–120</td>
<td>21</td>
<td>22.6</td>
<td>358</td>
<td>1.82</td>
</tr>
<tr>
<td>121–180</td>
<td>13</td>
<td>14.0</td>
<td>195</td>
<td>0.90</td>
</tr>
<tr>
<td>181–240</td>
<td>8</td>
<td>8.6</td>
<td>152</td>
<td>1.23</td>
</tr>
<tr>
<td>241–300</td>
<td>5</td>
<td>5.4</td>
<td>146</td>
<td>0.33</td>
</tr>
<tr>
<td>301–360</td>
<td>3</td>
<td>3.2</td>
<td>64</td>
<td>0.92</td>
</tr>
<tr>
<td>361–420</td>
<td>6</td>
<td>6.5</td>
<td>164</td>
<td>0.95</td>
</tr>
<tr>
<td>421–480</td>
<td>3</td>
<td>3.2</td>
<td>69</td>
<td>4.02**</td>
</tr>
<tr>
<td>481–540</td>
<td>5</td>
<td>5.4</td>
<td>143</td>
<td>1.46</td>
</tr>
<tr>
<td>&gt;540</td>
<td>8</td>
<td>8.6</td>
<td>146</td>
<td>1.44</td>
</tr>
</tbody>
</table>
Danko, 1995; Taylor, Levin, & Jasper, 1999; and Tsao & Odom, 2006).

**Implications**

More interventions should be conducted as early as possible since less time is wasted to reduce the impact of ASD (Rogers, 1998). In addition, increased social interactions can set the stage for other developments such as generalized use of newly acquired language skills, inclusion in more inclusive educational settings, and development of more positive and long-lasting relationships with peers and other people (Goldstein, Kaczmarek, Pennington, & Shafer 1992). Results of the present meta-analysis corroborated the belief of the importance of early intervention for children with autism.

More interventions need to be conducted with girls as well as with children diagnosed with Rett Syndrome, CDD, PDD-NOS, and Asperger’s Syndrome. Only 12 studies (21.4%) included 14 girls (11.9%), compared to 44 studies (88.1%) that included 104 boys (78.6%). One hundred and nine children (92.4%) were diagnosed with autism, while three studies included five children (4.2%) with Asperger’s Syndrome, three studies included four children (3.4%) with PDD-NOS, and no study reported any child diagnosed with Rett Syndrome or CDD. The number of girls as the target children was limited, so was the number of children diagnosed with Asperger’s Syndrome or PDD-NOS, partly because of the different prevalence among different genders or different diagnoses.

Future studies need to be conducted using peer-modeling for young children with autism to improve their social interactions. Peer modeling was most effective because it provides visually cued instruction with modeling for children with autism, who demonstrate a preference for visual learning such as the use of visual support instructional strategies (Bellini & Akullian, 2007). Video modeling using peers is one way of peer modeling. This method has the advantage of removing irrelevant stimuli of the modeled behavior through video editing so that the child with autism is able to focus better on the target behavior. In addition, video modeling using peers minimizes human interactions at the stage of acquisition of a new skill and helps reduce the distress and anxiety related to social interactions (Bellini & Akullian). Despite the high efficacy of the peer-modeling intervention, however, only six studies (12.8%) used it.

Results of the analyses indicate that peer-mediated interventions appeared to be moderately effective for improving social initiation. On the other hand, the intervention was highly effective for promoting social responses among young children with ASD. More studies need to be conducted to improve social response since only nine studies studied it (15.3%). Thirteen studies studied social initiation (22%), yet more studies need to be done to investigate how to effectively promote positive social initiations for children with autism.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>N</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity of Intervention (minutes/week)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–30</td>
<td>13</td>
<td>28.9</td>
<td>671</td>
<td>1.34</td>
</tr>
<tr>
<td>31–60</td>
<td>9</td>
<td>20.0</td>
<td>315</td>
<td>1.06</td>
</tr>
<tr>
<td>61–90</td>
<td>7</td>
<td>15.6</td>
<td>391</td>
<td>0.83</td>
</tr>
<tr>
<td>91–120</td>
<td>3</td>
<td>6.7</td>
<td>78</td>
<td>1.16</td>
</tr>
<tr>
<td>&gt;600</td>
<td>1</td>
<td>2.2</td>
<td>55</td>
<td>1.47</td>
</tr>
<tr>
<td>Not Specified</td>
<td>12</td>
<td>26.7</td>
<td>370</td>
<td>2.76</td>
</tr>
</tbody>
</table>

Note: •• indicates ES is significantly different from 0 (p < .01). * indicates that the effect sizes within the category are significantly different from each other (p < .05). ** indicates that the effect sizes within the category are significantly different from each other (p < .01).
More studies need to consider maintenance and generalization. Results of this meta-analysis demonstrate that the studies reported maintenance and generalization had higher effect sizes than the studies without reporting maintenance and generalization. In addition, there was a statistically significant difference between the effect sizes. However, the number of studies considering follow-ups and generalization was limited. Eighteen studies reported maintenance (38.3%), 16 studies reported generalization across settings (34.8%), 24 studies reported generalization across behaviors (53.3%), and 21 studies reported generalization across activities (46.7%). The studies considering maintenance or generalization did not occur until the 1990s. The higher effect sizes may be the result of a stronger design and a stronger intervention with maintenance and generalization. However, without the report of the efficacy of follow-ups and generalization, it is unclear how sustainable the intervention is or how feasible and realistic it is to expect school staff, parents/families and other practitioners to carry out interventions once researchers have left (Wheeler, 2007).

Results of this study indicate that the intervention was more effective if the interventionists were siblings. Despite the significance between the effect sizes of peers and siblings, more studies \( (n = 39) \) included peers as interventionists (84.8%), compared to five studies (10.9%) which included siblings as interventionists. Results of the present study also suggest the intervention was more effective if it took place at home. Many more studies \( (n = 28) \) took place in either integrated or segregated classrooms (57.1%), compared to five studies (10.2%) that took place at home. Additionally, eight studies involved researchers, peers/siblings, school staff, and parents/families (17%), compared to the majority of the studies \( (n = 37) \) which excluded parents/families in the intervention (78.7%). Similar to the studies considering maintenance and generalization, the studies with the involvement of all participants did not occur until the 1990s. Researchers have paid attention to the importance of family involvement in the process of intervention for a long time. As early as the 1970s, Lovaas, Koegel, Simmons, and Long (1973) point out that parents of children with autism were critical components of the habilitation process. They demonstrate that it is unlikely to maintain the gains of interventions without parents’ participation (Lovaas et al.). Given the findings of this meta-analysis that the studies were more effective with the involvement of all participants (e.g., the researchers, peers/siblings, school staff, and parents/families) and the importance of families in promoting learning and the value of ongoing interactions with the natural context (Wheeler, 2007), more studies need to be conducted in home and community settings, with siblings as interventionists, and with an active involvement of parents and families.

It is urgent to validate evidence-based practice in the study of social competence among young children with autism given (a) the dramatically increasing prevalence of ASD, (b) social interaction as a core deficit, (c) the heterogeneity of the participants, and (d) varying degree of the educational contexts that serve children with ASD. Results of the meta-analysis indicate the high efficacy of peer-mediated interventions as a method for promoting social interactions among children from birth to eight years of age with ASD. The study also provides integrated findings in detail and thus refines evidence-based peer-mediated intervention practices for young children with ASD. Future studies need to investigate the factors that contribute to more benefits and greater impact for young children with ASD.

References

References marked with an asterisk (*) indicate studies included in the meta-analysis.
* Baker, M. J., Koegel, R. L., & Koegel, L. K. (1998). Increasing the social behavior of young children...


Hwang, B., & Hughes, C. (2000). The effects of social interactive training on early social commu-


* Sainato, D. M., Goldstein, H., & Strain, P. S.


Postsecondary Education for Transition-Age Students with Intellectual and Other Developmental Disabilities: A National Survey

Clare K. Papay and Linda M. Bambara
Lehigh University

Abstract: Transition programs based on college campuses for students with intellectual and other developmental disabilities (IDD) ages 18–21 provide an opportunity for age-appropriate inclusion when peers without disabilities graduate from high school at age 18. The purpose of the present study was to examine the general characteristics of postsecondary education (PSE) programs for students with IDD and the extent to which students with IDD are participating in college classes through a national survey. Results suggest that (a) opportunities for students with IDD to participate in PSE programs may be limited to those students who are enrolled in school districts that fund and operate PSE programs and not open to all students, and (b) although many students with IDD are participating in college classes, the types of classes and the manner in which students participate appear to be linked to the level of students' academic abilities and the type of postsecondary education institution at which the program is located. Implications for future research and practice are discussed.

In recent years, interest has grown in providing postsecondary education experiences as part of the transition to adulthood for students with intellectual and other developmental disabilities (IDD). Many students with intellectual disabilities (synonymous with mental retardation, Schalock, Luckasson, & Shogren, 2007) or developmental disabilities (including autism and Asperger’s syndrome) have pervasive support needs and tend to stay in school until they age out of eligibility for special education services at age 21 or 22 (Wagner, Newman, Cameto, Garza, & Levine, 2005). These individuals may receive an alternative high school diploma, participate in alternative high-stakes assessments, and have an individualized education plan (IEP) that focuses on functional life skills, community-based instruction, and job training (Grigal, Neubert, & Moon, 2001). These youth are the least likely of all youth with disabilities to enroll in postsecondary education within 2 years of graduating from high school (Wagner et al., 2005), most likely because they typically do not meet college entrance criteria for academic performance. However, in a review of the literature on postsecondary educational practices for individuals with IDD, Neubert, Moon, Grigal, and Redd (2001) found that opportunities for educational, vocational, and recreational activities on college campuses have been provided to individuals with IDD since the 1970s and that these opportunities are now being increasingly extended to students who are still enrolled in high school.

Transition programs housed on college campuses and in other community locations (e.g., offices, storefronts, and businesses) emerged in the 1970s as alternatives to providing instruction on transition goals for students with IDD in high school settings (Neubert et al., 2001). These programs were considered to provide a more age-appropriate context for functional skill instruction for students with IDD ages 18–21 who were still eligible for special education services, but who exceeded the typical age of high school students. This approach recognized the need to make a distinction between the high school ex-

Correspondence regarding this article should be addressed to Clare K. Papay, College of Education, L111 Iacocca Hall, 111 Research Drive, Lehigh University, Bethlehem, PA 18015. Email: ckb3@lehigh.edu
periences that should be provided to students with IDD up to age 18 and postsecondary education experiences that should be provided to students ages 18–21 (Fisher & Sax, 1999). The focus of instruction in these programs was on vocational training, functional skills development, and work adjustment skills. Although some programs were housed on college campuses, instruction was largely segregated and offered few opportunities for interaction with same-age peers (Neubert et al.).

Beginning in the 1990s, increased emphasis was placed by the IDEA of 1990 and the IDEA Amendments of 1997 on postsecondary education for all students, including students with IDD. This emphasis, along with the logical expectations of families and teachers that inclusion with peers without disabilities would continue in postsecondary educational settings, led to a greater focus on creating inclusive postsecondary education options for students with IDD (Neubert et al., 2001). The Division on Mental Retardation and Developmental Disabilities of the Council for Exceptional Children advocated for the provision of services for students with IDD ages 18–21 in an age-appropriate setting such as a college campus (Smith & Puccini, 1995). The movement toward providing special education services to students with IDD ages 18–21 through postsecondary education (PSE) programs has grown to include opportunities for students with IDD to participate in college classes and activities with peers without disabilities.

Professionals in the field have categorized PSE programs for students with IDD as separate, mixed, or individualized program models (see Hart, Mele-McCarthy, Pasternack, Zimbrich, & Parker, 2004; Neubert & Moon, 2006; and Stodden & Whelley, 2004). Separate model programs, also referred to as substantially separate or segregated programs, are based on college campuses but offer no opportunities for inclusive activities with peers without disabilities. The focus of the curriculum in these programs is on life skills instruction, community-based instruction, and vocational training. Mixed model programs, sometimes called hybrid programs, offer opportunities for students with IDD to participate in inclusive activities including college classes with college students without disabilities and also involve some life skills or vocational instruction in a separate location or classroom on the college campus. Individualized model programs, or inclusive or individualized services, represent the highest level of inclusion for students with IDD as each student’s entire day is planned around his or her postschool goals and no instruction in self-contained classrooms occurs. In this model, students may be participating or matriculated into a course of study relating to their employment goals. Regardless of model, PSE programs can be located on the campuses of four-year colleges or universities or two-year or community colleges and have been referred to as transition programs on college campuses, dual enrollment programs, or college campus-based inclusion programs. For students who are receiving special education services through their local school districts, PSE programs may provide instruction and experiences for transition goals in the areas of employment, postsecondary education, and independent living.

As PSE programs for students with IDD who are still enrolled in high school are a relatively new concept, published reports have largely consisted of program descriptions, although one study examined the perspectives of multiple stakeholders on the inclusion of a transition-age student with IDD in a university course (Casale-Giannola & Kamens, 2006) and one study attempted to document the effectiveness of PSE programs for improving the postschool outcomes of youth with IDD through quantitative analysis (Zafft, Hart, & Zimbrich, 2004). To date, only three studies have conducted surveys across PSE programs with the purpose of documenting the characteristics of programs and the activities in which students are involved. Grigal et al. (2001) interviewed teachers in 13 PSE programs for students with IDD in Maryland. This study provided an overview of student characteristics as well as program locations, staffing, funding, referral and admission practices, and program components in programs in this state. Building on this initial study, Neubert, Moon, and Grigal (2004) surveyed 11 of these same PSE programs in Maryland to identify the types of activities in which students participate. In this survey, participation in employment training was found to be occurring for almost all students in these programs, but op-
opportunities for participation in college classes were limited. Approximately one third of students were reported to have enrolled in a college class but only 2% of all students in programs in the sample had taken a college class for credit. Other students had taken non-credit classes or audited college classes. The majority of classes that students with IDD had participated in were health and fitness classes, although some students had also participated in computing or remedial reading and math classes. In another study, Hart et al. (2004) provided a national perspective on the characteristics of programs based on college campuses through a survey of 25 programs and a detailed description of six programs. Characteristics including length of time in operation and program enrollment were described for each type of model (individualized, mixed, separate), and other characteristics including types of disability served, use of school district funds, and barriers to postsecondary education were described across the sample. The findings of this survey suggested that students with a wide range of disabilities may be served in PSE programs and that differences may exist in length of time in operation and program enrollment between individualized, mixed, and separate model programs.

As research on PSE programs is still evolving, descriptive studies are needed to address two critical gaps in our knowledge. First, as most reports have been program descriptions and surveys that were limited either geographically (Grigal et al., 2001; Neubert et al., 2004) or by small sample size (Hart et al., 2004) there remains a paucity of information on the general characteristics of PSE programs from a national perspective. As these types of programs have developed in isolation through the efforts of family members and practitioners (Hart et al.) information on the program enrollment, admissions criteria, responsibilities for funding and operation, and the purpose of PSE programs is needed. Second, more information is needed on the extent to which students with IDD are participating in college classes. Although Neubert et al. found that approximately one third of students with IDD in PSE programs in Maryland were participating in college classes, there remains a need to examine the extent to which this is occurring on a national level. Given the relatively recent philosophical shift from segregated programs to programs that provide opportunities for students with IDD to participate in inclusive college classes and given claims that transition-age students with IDD are attending college through these programs, an examination of the extent to which students with IDD are participating in college classes and the types of classes in which they are participating is needed to provide a realistic picture of the postsecondary education opportunities provided through PSE programs.

The purpose of the present study was to address some of the questions that remain about the nature of PSE programs and access to college classes through a national survey of these types of programs. Two broad research questions were targeted by the survey:

1. What are the overall characteristics of PSE programs that serve students with IDD who are ages 18–21 and still receiving special education services? Specifically, this survey focused on answering questions about the prevalence of each type of program model and location, responsibilities for operation and funding, and whether programs were time-limited based on grant funding or were funded through sustainable sources. Additionally, the survey targeted questions about program enrollment, admissions criteria, and the purpose of participating in a PSE program.

2. To what extent are students with IDD participating in college classes? Specifically, this survey focused on describing the percentage of students in PSE programs taking college classes, the prevalence of each method of participation in college classes (e.g., formally enrolling in a class for credit or audit or informally taking a class by sitting in), and whether this differs either by students’ academic abilities or disabilities. Finally, the survey focused on questions regarding the types of college classes taken by students with IDD and the extent to which students with IDD are provided with modifications and accommodations to participate in college classes.

Across all research questions, differences
between types of models (individualized, mixed, and separate) and program locations (four-year college or university and two-year or community college) were examined.

**Method**

*Survey Development*

A web survey format was chosen to increase the ease with which participants could access the survey and to reduce the costs of conducting a national survey. Survey questions were developed based on the research questions and an online survey was constructed in line with the principles for web survey design proposed by Dillman (1999) using the Survey Monkey website. The web survey was reviewed by two experts who had conducted previous surveys of PSE programs and revisions were made based on their feedback. The survey was then piloted with eight program coordinators from PSE programs to ensure that the survey questions would solicit targeted information. The final survey consisted of 11 questions relating to general characteristics followed by 8 questions relating to college classes. The format of responses to questions included open ended responses, yes/no/don’t know responses, or selection of responses from a list either through drop down menus allowing single responses or check boxes allowing multiple responses.

*Survey Implementation and Procedures*

The survey was submitted to coordinators of PSE programs nationwide between August and December, 2008. A national database of PSE programs for individuals with IDD, Think College (www.thinkcollege.net), was used to locate programs for the survey. The Think College database was developed by the Institute for Community Inclusion at the University of Massachusetts in Boston through a grant from the U.S. Department of Education, Office of Special Education Programs and is updated regularly. This database comprised the most recent information on programs known to researchers who had conducted previous surveys (D. Hart, personal communication, August 26, 2008). All programs listed in this database provided access to postsecondary education for individuals with IDD. However, it was clear from an initial examination of programs listed in the database that many of these programs were not exclusively for transition-age youth with IDD as some programs served both adults and transition-age youth with IDD and some programs served individuals with other disabilities as well as those with IDD. Furthermore, some programs that offered opportunities for postsecondary education were part of larger programs that may not have been located on a college campus. For these reasons, clear guidelines for selecting programs from the database in line with the purpose of the survey were developed. Programs were deemed to be eligible for inclusion in the study if they (a) provided access to the campus of a postsecondary education institution (e.g., four-year or two-year university or college or community college), (b) served students with IDD, (c) served students who were ages 18–21 and who were still receiving special education services, and (d) were located in the United States. Programs were excluded if they did not provide access to a college campus, did not serve students with IDD, or served only adults who had already graduated from high school. A total of 87 programs in the database were identified as eligible for inclusion.

Program coordinators who were knowledgeable about both the structure and operation of programs and the activities of individual students were targeted to provide information for the study. Coordinators of all eligible programs were contacted via e-mail to explain the purpose of the study, provide instructions for completing the survey, and provide a link to the survey website. Follow-up e-mails were sent three times to coordinators who did not respond to initial and subsequent e-mail requests. A total of 58 responses to the survey were completed. However, six survey responses were excluded from analyses because coordinators reported that these programs either did not provide access to a college campus, did not serve students who were still receiving special education services (i.e., only served adults with disabilities), or did not serve students with IDD (i.e., served only students with learning disabilities). After removing these responses, 52 program coordinators...
completed the survey for a response rate of 64% out of 81 eligible programs.

**Analyses**

Descriptive methods were employed to analyze responses to survey questions. When calculation of mean scores was necessary, the data package SPSS was used to look for outliers in the data. Median scores were also calculated when outliers were found. Qualitative analysis was used to categorize the types of college classes reported by the program coordinators.

**Results**

*Research Question 1: Characteristics of Programs*

Program model type, location, operation and funding structure, and sustainability. General characteristics of programs are provided in Table 1. The majority of programs were mixed model \((n = 40)\) with fewer programs of the individualized and separate model types \((n = 6)\) of each type. More programs were located on two-year or community college campuses than four-year college/university campuses \((57.7\% \text{ vs. } 42.3\% \text{ of programs respectively}). No difference in the type of program model by the location of the program was discernible, with approximately equal proportions of individualized, mixed, and separate models across two-year college and four-year college/university campuses.

The majority of programs \((55.8\%)\) were operated by school districts but may also have been operated by the college \((21.2\%)\), an outside organization \((17.3\%)\), or through a collaborative partnership between the school district and the college \((7.7\% \text{ overall but } 50\% \text{ of individualized model programs}). Almost all programs were funded by school districts \((86.5\%)\). Student tuition was the second most frequently cited funding source after school district funds \((25\%)\), with the exception of individual programs in which student tuition was not a source of funding. Federal grants were relatively rare across the sample \((13.5\%)\). Other funding sources including vocational rehabilitation or Medicaid funds, other grants \((\text{e.g., National Down Syndrome Society grant})\), and fundraising were used by 13.5\% of programs. To assess whether programs were sustainable based on the present funding structure, program respondents were asked if programs were time-limited based on grant funding or if the program was anticipated to continue given the present funding structure. Almost all program respondents indicated that their programs were sustainable given the present funding structure: only two programs in this sample were time-limited based on funding.

*Program enrollment.* Program respondents were asked to provide the number of students enrolled in their program who spent time on a college campus (some programs included students who did not participate on campus). The average number of students enrolled in PSE programs overall is shown in Table 1. As these numbers varied greatly, both means and medians are reported as well as the range in responses. Across all programs, median program enrollment was only 12 students, although a handful of programs with much larger enrollment resulted in a higher average number of students enrolled \((M = 24.9\)). Greater numbers of students were enrolled on average by separate model \((M = 24, Mdn = 20)\) and mixed model \((M = 26.9, Mdn = 12)\) programs than individualized model \((M = 13.4, Mdn = 7)\) programs.

*Admission into PSE programs.* The criteria used by PSE programs for admitting students with disabilities are shown in Table 2. Program respondents were asked to indicate the admissions criteria they used as well as any criteria that were used to exclude students from their programs. Overall, the main criteria for admission were that the student must be over a specified age \((87\% \text{ of programs}), have indicated a desire to be on a college campus \((52\%)\), and be in a particular school district \((46\%)\). Mixed and separate model programs also considered other criteria such as completion of a specified number of years of high school \((38\% \text{ of mixed model and } 67\% \text{ of separate model programs}) or prerequisite experiences \((18\% \text{ and } 50\%)\), demonstration of prerequisite skills \((38\% \text{ and } 33\%)\), and the student’s ability to navigate to and around campus \((35\% \text{ and } 33\%; \text{ and } 33\% \text{ and } 17\% \text{ respectively}). The majority of mixed and separate programs excluded students who exhibit challenging behavior \((60\% \text{ and } 67\% \text{ respec-}
tively) and at least a third of these programs also excluded students who lack safety skills (33% and 50%). No individualized programs reported excluding students on the basis of challenging behavior or a lack of safety skills. A higher proportion of individualized programs than mixed or separate programs stated that they have no criteria for excluding students (67% vs. 28% and 17% respectively).

**Purpose of PSE programs.** Program respondents were asked to select all purposes of their programs from a list of four specified options. The most frequently stated purpose of being on a college campus was for employment or opportunities for vocational training (90% of all programs). Following this, inclusion with same age peers (75%) and development of independent living skills (75%) were the next most frequently stated purposes of being on a college campus. Postsecondary education was listed as a purpose of being on a college campus by 100% of individualized programs and 67.5% of mixed model programs. No differences in the purpose of being on a college campus were perceived between programs located at two-year college and four-year college/university campuses.

**Research Question 2: Participation in College Classes**

**Percentage of students with IDD taking college classes.** Program respondents were asked to provide the number of students who were par-
The percentage of students taking college classes was calculated by dividing the total number of students reported to be taking college classes by the total number of students enrolled in all 52 PSE programs and multiplying by 100. This percentage was then calculated by type of model and location of program. Approximately one quarter (23.7%) of all students enrolled in PSE programs were taking college classes. The percentage of students in PSE programs who were participating in college classes was higher in individualized programs compared to mixed model programs (97.2% vs. 21%) but little difference in the percentage of students participating in college classes was perceived between programs located at two-year or community college campuses compared to four-year college/university campuses (19.9% vs. 21.8%). (Note that, by definition, separate model programs do not offer access to inclusive college activities including college classes). Interestingly, 100% of individualized model and 85% (n =34) of mixed model programs, reported that at least one student was taking a college class.

Prevalence of each method of class participation. For each student enrolled in a PSE program who took a college class in the 2007-8 school year, program respondents were asked to provide (a) a rating of the student’s academic ability, (b) the primary disability classification of the student, and (c) the method in which the student was participating in each college class. To ascertain an understanding of the academic abilities of students with disabilities participating in college classes, program respondents were also asked to rate the academic ability of each student taking a college in their program using the following scale:

- Advanced: Reading, writing, or math ability is sufficient for the student to be able to take college level academic classes with no accommodations.
- Sufficient: Reading, writing, or math ability is sufficient for the student to be able to take academic classes with necessary accommodations.
- Limited: Reading, writing, or math ability is at the K-3rd grade level, student has limited
or emerging academic skills or has only functional use of these skills.
- No academic skills: Student has no reading, writing, or math skills.

Program respondents were asked to select one academic ability level for each student from a drop down list of these four options. However, as a previous survey by Hart et al. (2004) found that some PSE programs report serving students with learning disabilities or mental health disabilities, it was possible that analyses of the method by which students with IDD were participating in college classes could be skewed by the inclusion of students who would not typically be considered as having IDD. For this reason the disability classification of each student was requested even though programs had to serve students with IDD to be included in the survey and program respondents were asked throughout to consider only students with IDD when responding. For each student, program respondents then selected the method (or methods if more than one was applicable) by which the student was taking classes from a list of specified options: matriculated into a degree program, taking a college class for credit, auditing a college class, informally taking a college class by sitting in a class without being enrolled through the college, or taking a noncredit/continuing/adult education class either formally or informally. The methods of participating in college classes were then analyzed to determine if there were differences by academic ability rating, disability, or program location.

The number of students rated at each academic ability level participating in college classes by each method was totaled across all survey responses and results are presented in Figure 1. Overall, this figure shows that more students were taking college classes for credit \( (n = 97) \) than auditing classes \( (n = 71) \), taking classes informally \( (n = 89) \), or taking noncredit classes \( (n = 25) \). More students rated with advanced or sufficient academic skills

![Figure 1. Methods of Participating in Classes by Students at each Academic Ability Level across Programs.](image)
were reported to be taking college classes either for credit or audit than taking college classes informally, whereas more students with limited academic skills were reported to be taking college classes informally than enrolled in classes for credit or audit.

The methods of participating in college classes by students with each type of disability are shown in Table 3. The number of students with each disability taking each type of class was totaled across all survey responses. For example, across all responses, 39 students listed as having a learning disability (LD) were taking a college class for credit. Note that students could be participating in classes by more than one method so these numbers cannot be totaled across columns to give the total number of students with each type of disability. Of students who were taking college classes for credit, the majority were classified as having LD (n = 39) but only a small number of students were classified as having IDD such as mild mental retardation (n = 16), moderate mental retardation (n = 7), autism (n = 9), and Asperger’s (n = 12). However, the majority of students auditing classes were students with mild mental retardation (n = 29) and the majority of students listed as informally taking college classes were those with mild or moderate mental retardation or autism (n = 24, 31, and 18 respectively). Few students with severe mental retardation were listed as taking college classes (n = 2 for noncredit/continuing/adult education classes). No students with IDD were listed as being matriculated into a college degree program.

Further analysis of the methods of participating in college classes by location of programs suggested that more programs located at community colleges (n = 11) reported that students were taking college classes for credit than that students were auditing classes (n = 7), taking classes informally (n = 3), or taking noncredit classes (n = 7). However, more programs located at four-year college/university campuses reported that students were taking classes informally (n = 9) than taking college classes for credit (n = 3), auditing classes (n = 5) or taking noncredit classes (n = 3).

**Types of college classes.** Program respondents were asked to provide examples of the types of classes that students take for each method of participating in college classes. Content analysis was then conducted to cluster examples of similar courses into common categories to obtain counts of the relative frequencies of each type of class. This analysis suggested that the types of classes fell into seven categories as shown in Table 4. The types of classes in which students with IDD were reported to be participating varied greatly, from nonacademic classes such as health and fitness, arts, and leisure classes, to pre-college level and college-level academic classes, and vocational classes designed to prepare students for a specific career. The number of examples provided by program respondents in each category was then counted to look for differences in the method of participating in college classes across categories. Results are shown in Table 5. Two patterns were suggested through this analysis. First, classes

### TABLE 3

<table>
<thead>
<tr>
<th>Disability</th>
<th>Matriculated</th>
<th>Credit</th>
<th>Audit</th>
<th>Informally</th>
<th>Noncredit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning disability</td>
<td>0</td>
<td>39</td>
<td>8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Mild mental retardation</td>
<td>0</td>
<td>16</td>
<td>29</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Moderate mental retardation</td>
<td>0</td>
<td>7</td>
<td>4</td>
<td>31</td>
<td>4</td>
</tr>
<tr>
<td>Severe mental retardation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Autism</td>
<td>0</td>
<td>9</td>
<td>11</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>Asperger’s Syndrome</td>
<td>0</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Traumatic brain injury</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Other health impairment</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Emotional/behavioral disorder</td>
<td>0</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>
reported as being taken for credit largely consisted of vocational and remedial classes, whereas classes reported as being taken informally or audited largely consisted of academic, health and fitness, and arts classes. Few examples of classes fell into the leisure/home category. Second, the majority of examples of classes taken for credit were provided by coordinators of programs located at two-year or community colleges, whereas the majority of examples of classes taken informally were provided by coordinators of programs located at four-year college/university campuses. Examples of classes that were audited were listed approximately equally by coordinators of programs located at two-year college and four-year college/university campuses. No patterns were detected in the examples of noncredit/continuing/adult education classes.

**Modifications and accommodations.** To assess to what extent college classes are the same for students with IDD as for all college students, program coordinators were asked about modifications and accommodations that are typically made for students with IDD taking college classes. Accommodations that aid students to access the curriculum of a class or demonstrate mastery of content but that do not fundamentally alter what is to be learned are permissible under the Americans with Disabilities Act (ADA) of 1990 for students taking postsecondary education classes. Modifications that change the requirements for participation in postsecondary education classes are not permissible under ADA for classes that are taken for credit. It was therefore hypothesized that for college classes taken by students with IDD to include the same level of content and assessment as for all college students, these classes would need to be offered with accommodations only and without modifications. Modifications were de-

**TABLE 4**

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Examples</th>
<th>Primary method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational</td>
<td>Preparation for a specific trade, occupation, or vocation</td>
<td>Automotive Child care</td>
<td>Credit</td>
</tr>
<tr>
<td>Remedial and college preparation</td>
<td>Preparation for college through acquisition of basic skills/knowledge</td>
<td>Basic reading Basic math</td>
<td>Credit</td>
</tr>
<tr>
<td>Computing</td>
<td>Instruction in general/ specific computer skills</td>
<td>Introduction to computers Keyboarding</td>
<td>Credit</td>
</tr>
<tr>
<td>Health and fitness</td>
<td>Instruction in sport skills/ opportunities for exercise</td>
<td>Swimming Dance</td>
<td>Audit/Informally</td>
</tr>
<tr>
<td>Arts</td>
<td>Instruction in arts (drama, music, and visual arts)</td>
<td>Acting Drawing</td>
<td>Audit/Informally</td>
</tr>
<tr>
<td>Academic</td>
<td>Instruction in specific subject areas</td>
<td>Early childhood education History</td>
<td>Audit/Informally</td>
</tr>
<tr>
<td>Leisure/home</td>
<td>Instruction in skills for use in the home/ for leisure</td>
<td>Cooking Baking</td>
<td>NA</td>
</tr>
</tbody>
</table>
fined as changes to the curriculum or requirements for participation in a college class and accommodations were defined as alterations of environment, curriculum format, or equipment that allow students to gain access to content and complete assigned tasks but that do not fundamentally alter what is to be learned or assessed. Program respondents were first asked if modifications or accommodations were provided to students in their program and then asked to indicate which specific modifications or accommodations were made from a list of options. About half of all programs (52.5%) reported making modifications to college classes. Very few programs reported that modifications were made to classes taken for credit; more programs reported making modifications to classes that were either taken informally or audited (see Table 6). The most common modifications to classes that were audited or taken informally were modifications to assignments. Many

<table>
<thead>
<tr>
<th>Category of class</th>
<th>Credit</th>
<th>Audit</th>
<th>Informally</th>
<th>Noncredit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational</td>
<td>21</td>
<td>7</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Remedial and college preparation</td>
<td>20</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Computing</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Health and fitness</td>
<td>10</td>
<td>9</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Arts</td>
<td>6</td>
<td>7</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Academic</td>
<td>13</td>
<td>28</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Leisure/home</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of program</th>
<th>Credit</th>
<th>Audit</th>
<th>Informally</th>
<th>Noncredit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-year or community college</td>
<td>71</td>
<td>34</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>4-year college/university</td>
<td>11</td>
<td>27</td>
<td>70</td>
<td>8</td>
</tr>
</tbody>
</table>

TABLE 6

Number of Programs Reporting each Type of Modification or Accommodation for each Method of Participation

<table>
<thead>
<tr>
<th></th>
<th>Credit</th>
<th>Audit or informally</th>
<th>Noncredit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modifications to curriculum</td>
<td>1</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Modifications to assignments</td>
<td>3</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Reduced number of assignments</td>
<td>1</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Assignments not required</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accommodations</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodations available to all</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Accommodations made by instructor</td>
<td>7</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Accommodations made by PSE program</td>
<td>6</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Changes to instructional delivery</td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Changes to assessment format</td>
<td>4</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Support by program teacher/ aide</td>
<td>6</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Support provided by peer mentor</td>
<td>7</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
more programs reported making accommodations than modifications, with only one program reporting that accommodations were not made. The most frequently stated accommodation for credit classes was the use of accommodations that are available to all students by law \( (n = 14) \). A greater number of programs reported that accommodations were made by their program for college classes that were audited or taken informally than for credit classes and noncredit classes \( (n = 18 \text{ vs.} 6 \text{ and} 8 \text{ respectively}) \). The least frequently cited accommodation across all types of college classes was changing instructional delivery.

**Discussion**

The results of this survey provide important information on the extent to which students with IDD are involved in PSE programs on college campuses and provided with the opportunity to participate in college classes. Sixty-four percent of the 81 PSE programs that met the study’s inclusion criteria responded to the survey, resulting in the highest number of programs surveyed over previous studies. A number of important findings in regard to the characteristics of programs and participation of students with IDD in college classes are apparent.

**General Characteristics**

Several characteristics of these programs are of interest. The majority of programs were operated and funded by school districts, yet many other approaches to operation and funding were reported, indicating that there is no single approach to the organization of these programs. Although many programs may have been initiated through federal or state grants, sustainable sources of funding have developed with almost all programs now indicating that they are not time limited based on grant funding. The average number of students enrolled in PSE programs varied widely across programs, although individualized model programs had smaller enrollment than mixed and separate model programs. The relatively low enrollment sizes across all types of programs \( (Mdn = 12) \) suggest that PSE programs may not be an option for all students with IDD in a particular school district but may be reserved for particular types of students. Taken together, these findings indicate that although the majority of programs are funded and operated by school districts, use a mixed model approach, and enroll a small number of students, there are some programs that do not fit this description.

In regards to admissions criteria for PSE programs, the most frequently stated criterion for admission was the age of the student, indicating that these programs may be reserved for students ages 18–21 in line with age-appropriate inclusion. In addition to meeting age criterion, additional criteria that are considered are that the student has indicated a desire to be on campus, suggesting that students must be motivated to participate in a college-based experience, and that the student must be from a particular school district. Mixed and separate model programs also consider other admissions criteria and many exclude students who exhibit challenging behavior or who lack safety skills or the ability to travel to and around campus independently. These factors are not considered by individualized programs, suggesting that individualized programs can be more flexible in whom they choose to support. Indeed, one coordinator of an individualized model program explained that the student’s motivation to participate in postsecondary education was of greater importance and stated, “We have not excluded students with challenging behavior if this other criteria of intellectual curiosity is satisfied.” Taken together, these findings suggest that the majority of programs admit only those students who are motivated to be on a college campus and do not admit students who may present a higher level of need for support with appropriate behavior, safety, or mobility skills, but that there are certain programs, particularly individualized model programs, that may be willing or able to provide this level of support. Furthermore, as school districts are responsible for funding and operating the majority of PSE programs, it is important to note that opportunities for students with IDD to participate in PSE programs may be limited to those students who are enrolled in school districts that fund and operate PSE programs and not open to all students as a college would be.
A greater level of consensus was found in the purpose of being on a college campus. Almost all program coordinators responded that the purpose of students being on a college campus was for opportunities for employment or vocational training and three-quarters cited additional purposes of inclusion with same-age peers and opportunities for development of independent living skills. Interestingly, participation in college classes was cited less frequently than all three of these purposes with the exception of individualized model programs in which postsecondary education was unanimously stated as a purpose of being on a college campus. This finding suggests that we could perhaps refer more accurately to programs based on college campuses as *employment programs based in age-appropriate settings* rather than as postsecondary education programs.

**Participation in College Classes**

A number of approaches were taken to examine the extent to which students with IDD participate in college classes. Although a high percentage of programs reported that at least one student was taking a college class, only about one quarter of all students in PSE programs were participating in college classes. Differences were perceived in the percentage of students in mixed model programs compared to individualized model programs who were provided with this opportunity. Students in mixed model programs were much less likely than students in individualized model programs to be participating in college classes. No differences were perceived between two-year or community colleges and four-year colleges/universities in the percentage of students participating in classes.

Further examination of the participation in college classes by students of varying academic ability levels and disabilities also revealed differences in methods of participation. Students with less significant disabilities and higher academic ability levels were more likely to be participating in college classes in which they were formally enrolled either for credit or audit, whereas students with more significant disabilities and lower academic ability levels, in other words, those with IDD, were more likely to be informally participating in college classes. Differences were also found in the method of participating in college classes based on the location of the program. More programs located at two-year or community colleges reported that students were taking college classes for credit than for audit or informally, whereas more programs located at four-year college/university campuses reported that students were taking classes informally than taking college classes for credit or audit. In sum, it appears that the extent to which students with IDD are provided with the opportunity to participate in college classes and the method used to participate in classes may depend on several factors including the type of program model, the location of the program, and the level of academic ability of the student. This finding also suggests that the term “dual enrollment,” as has been used in previous studies to describe students with IDD participating in PSE programs (e.g., Hart et al., 2004) may be used incorrectly if the majority of students with IDD who are still enrolled in their school districts are not formally enrolled in postsecondary education classes.

The types of college classes taken by students with disabilities appeared to differ based on the location of the PSE program and the method of participating in college classes. Programs based on two-year or community college campuses appear to be more likely to offer students the opportunity to participate in classes for credit than programs based on four-year college/university campuses where students may be more likely to take classes informally. The majority of classes taken for credit fell into the categories of vocational and remedial classes whereas the majority of classes taken informally or audited were academic, health and fitness, and arts classes. Combined with the findings regarding the factors that influence the participation in college classes, these findings suggest that (a) the most academically able students or those students in programs located at two-year or community colleges are the most likely to be taking classes for credit and these classes are most likely to be vocational or remedial classes in which they have the skills to participate or that match their transition goals, and (b) the less academically able students or those students in programs located at four-year colleges/universities are more likely to be taking classes...
informally and these classes are most likely to be health and fitness or arts classes based on their interests or academic classes based on what is available to students in the program. Interestingly, a number of examples of academic classes reported by program respondents were education classes, suggesting that students who are less academically able may be invited into education-oriented classes by professors of education. This opportunity may arise from the involvement of professors of education in the initiation and operation of PSE programs or from an understanding and desire to support the goal of age-appropriate inclusion that may be more common among professors of education than other college professors.

To assess to what extent college classes are the same for students with IDD as for all college students, program coordinators were asked about modifications and accommodations that are typically made for students with IDD taking college classes. The findings of the survey indicate an interesting pattern: few programs reported making modifications to credit or noncredit classes in which students were formally enrolled; the majority of reported modifications were made to classes that were either audited or taken informally. From this finding we can infer that classes in which students are formally enrolled may look the same for students with IDD as for all college students, whereas classes in which students are “sitting in” may be modified to include fewer requirements or a reduced amount of content. This may be due to the requirements of the law that do not allow for significant changes to the curriculum or assessments to be made for students who are enrolled in a class through the college or university. Such changes may be permissible when students are unofficially taking the class.

We can build further on this finding to incorporate results regarding the level of academic ability and the types of classes and method of participating in college class and make the following postulation: As the most academically able students or those students in programs located at two-year or community colleges are the most likely to be taking classes for credit and as these classes are most likely to be vocational or remedial classes in which they have the skills to participate, modifications to curriculum or assessment are not needed or permissible. However, as the less academically able students or those students in programs located at four-year colleges/universities are more likely to be taking classes informally and as these classes are most likely to be health and fitness or arts classes based on their interests or academic classes based on what is available to students in the program, modifications to curriculum or assessment are most likely needed for students to be able to participate in classes and are permissible. Given that students enrolled in classes for credit tended to be those with LD, one wonders whether students with IDD, in other words those with actual cognitive disabilities and low academic abilities, are indeed attending college as we currently define college to be. This raises several questions regarding the nature, purpose, and benefits of participation in college classes for students with IDD. If classes are modified to allow students with IDD to participate, how useful are these classes after modification? Are the skills and knowledge that are important to college students watered down or removed for students with IDD? If classes are not taken to help students reach their postschool education or employment goals, then what is the purpose of taking classes? Furthermore, how do students with IDD benefit from taking classes based on their interests or based on which professors are open to this idea? Are there real opportunities for social inclusion in these classes or are students just sitting in classes without support for academic learning or inclusion with same-age peers? These questions remain to be addressed through future research.

Limitations of the Study

Several limitations to the study are apparent and must be acknowledged. First, a number of problems were encountered in selecting eligible programs. The term “IDD” can be interpreted in different ways and, although a definition was provided in the instructions for the survey, many programs responded that they served students with LD and other disabilities that would not typically be defined as IDD. Additionally, the understanding of the term “graduated” is not clear for students who have completed all requirements for graduation.
and have walked with their graduating class but who may continue to receive special education services until age 21. The difficulties in targeting only those programs who serve students with IDD ages 18–21 who are still receiving special education services are highlighted by the exclusion of six survey responses from programs that appeared to meet these clearly defined criteria but that, in reality, did not. For this reason, programs that did not appear to meet the criteria for inclusion in the study or that had not been included in the Think College database may have been excluded unnecessarily.

Second, an inherent limitation exists in reporting the frequency of responses across respondents. Differences in characteristics and in approaches to operating programs on college campuses do appear to exist between certain subgroups, such as two-year or community colleges and four-year colleges/universities or between individualized, mixed, and separate model types. However, it is possible that further subgroups exist within these categories, and reporting only the frequency of responses may cause some important information on these subgroups to be lost. Indeed, it is possible that the most frequent responses to survey items are not characteristic of any one program in reality. Identification of these trends in survey responses is difficult due to the small number of programs, and a different approach may be necessary to describe the true nature of subgroups of these programs.

Third, although the response rate of 64% is good for a typical survey, it may not be sufficient here. As there are relatively few programs that fit the criteria for participation in the survey, a response rate of less than 100% may mean that the findings are not representative of all programs. Findings of differences between individualized and mixed model programs must be interpreted with additional caution given that only six programs of all the respondents were individualized model programs.

Finally, the analysis of the types of college classes has many limitations. Program respondents were asked to list examples of the types of classes taken by students with IDD for each method of participation (e.g., examples of classes taken for credit, examples of classes that were audited, and so on). Asking program respondents to list the classes taken by each individual student along with disability, academic level, and method of participation in classes was deemed to be too cumbersome and may have resulted in a lower response rate on this item. However, in order to obtain a measure of the relative frequency of each category of class, the number of examples had to be counted. As some program respondents provided only one example for each method of participation whereas others provided a long list of examples for each method, counts of these examples may not accurately reflect the actual distribution of the categories of classes taken by students with IDD.

Despite these limitations, this study makes an important contribution to our understanding of the nature of PSE transition programs for students with IDD from a national perspective. Increasing our understanding of how these programs operate is important if these programs continue to grow in number and become a widely available option along the continuum of services for students with IDD. It is important that we have a realistic understanding of the opportunities provided to students with IDD, particularly in relation to access to college classes, to aid persons interested in initiating new programs and address the objections that may be held by school district and postsecondary education professionals.

**Future Directions**

Future research should continue to enhance our understanding of these programs, particularly in relation to the other PSE activities in which students with IDD are participating and the benefits of participating in both these activities and college classes with students without disabilities. Further examination of the nature and purpose of participation in college classes for students with IDD is warranted, particularly in relation to the purpose of participation in classes that are modified substantially or the purpose and benefits of participation in classes that are taken for other reasons than to help students reach their postschool education or employment goals. Exploration of the opportunities for social inclusion in college classes and the methods of providing support for academic learning and social in-
Integration are needed. A case study approach may address some of the limitations of the survey by providing an in-depth analysis of a small number of PSE programs that are representative of the population. This approach could be used to further examine the differences in opportunities available at programs located at two-year or community colleges compared to four-year college/university campuses or in the differences in the on-campus activities of students with higher academic abilities compared to those with lower academic abilities.

Although many questions remain to be addressed through research, this should not prohibit schools and postsecondary education institutions from forming partnerships to begin providing access to postsecondary education using whatever model and supports fit their individual students’ needs. Regardless of the approach taken for providing supports on a college campus or the opportunities provided by a particular program for students with IDD to participate in activities with peers without disabilities, PSE programs for students with IDD ages 18–21 offer a promising opportunity to promote lifelong inclusion and self-determination. In order to explore the benefits that these programs may offer efforts should continue to increase awareness and development of these valuable opportunities.

References

Received: 18 August 2009
Initial Acceptance: 25 October 2009
Final Acceptance: 9 January 2010
Perceptions of Supported Employment Providers: What Students with Developmental Disabilities, Families, and Educators Need to Know For Transition Planning

Sherril Moon, Monica L. Simonsen, and Debra A. Neubert
University of Maryland

Abstract: The purpose of this exploratory study was to survey community rehabilitation providers (CRPs) to determine their perceptions of the skills, experiences, and information that transitioning youth with developmental disabilities (DD) and their families need to access supported employment (SE) services. Supervisors of SE from 12 CRPs across one state provided their perceptions of eligibility requirements for SE services. Results related to the skill requirements and work experiences needed by transitioning youth support previous research findings including paid work experiences, instruction in self-management and advocacy skills, and transition assessments that document employment preferences, interests, and needs. Other findings support the need for educators to teach transitioning youth and families about getting long-term funding through the state DD agency and Medicaid Waivers, and to prepare families for changes as CRPs continue to phase out facility based work options and provide only SE. CRP staff strongly encouraged transitioning youth, not families, to communicate their own employment preferences and skills at intake interviews.

Secondary practices and experiences that facilitate students’ transition from high school to college or work is a topic that continues to capture public attention (Education Week, 2008). For secondary students with disabilities, education and transition practices that ease this transition and lead to optimal post school outcomes have been researched since the 1980’s. Recommended and evidence-based secondary practices have been documented through reviews of the literature (Allwell & Cobb, 2006; Cobb, Lehmann, Newman-Gonchar, & Alwell, 2009; Kohler & Field, 2003); surveys of special educators (Agran, Snow, & Swarner, 1999; Noonan, Morningstar, & Erickson, 2008; Zhang, Ivester, Chen, & Katsiyannis, 2005); qualitative case studies (Collett-Klinger, 1998; Neubert & Redd, 2008); follow-up studies (Benz, Lindstrom, & Yovanoff, 2000; Blackorby & Wagner, 1996; Heal & Rusch, 1995; Wagner, Newman, Cameto, Levine, & Garz, 2006); and analysis of large-scale data bases (Katsiyannis, Zhang, Woodruff, & Dixon, 2005).

In general, this literature points to enhanced outcomes for youth with disabilities who have participated in paid employment experiences, career and technology courses, self-determination instruction, transition assessments, and transition planning processes that target interagency links and family participation. However, post school outcomes and secondary practices differ for students with high incidence disabilities (learning disabilities, attention deficit disabilities) and for those with low incidence disabilities (mental retardation, traumatic brain injury, and multiple disabilities) especially in terms of employment (Wagner et al., 2006; Wehman, 2006). Additionally, employment supports and resources vary greatly for individuals with low-incidence disabilities (Winsor & Butterworth, 2008).

Transitioning youth with developmental disabilities that include low-incidence disabilities are likely to need on-going, individualized supports in order to participate in inclusive work experiences as adults (U.S. Equal Employment Opportunity Commission, 2004). These individuals often attend public
school until age 21 and are likely to receive a certificate of attendance or completion rather than a diploma as they exit public school. Eligible transitioning youth may receive long-term funding through their state’s developmental disabilities agency. This funding is often disbursed to adult agencies, known as community rehabilitation providers (CRPs), who have provided a continuum of employment services, including SE and facility-based options.

While a recent study found transitioning youth with developmental disabilities (DD) and their families prefer integrated or SE outcomes (Neubert & Redd, 2008), studies of adults with DD document the prevalence of work in segregated settings, despite paradigm shifts to provide SE opportunities (Rusch & Braddock, 2004; Winsor & Butterworth, 2008). These findings are particularly troublesome as CRPs are faced with streamlining services and providing SE options only (Winsor & Butterworth). Therefore, transitioning youth with DD, families and educators need to understand eligibility requirements for CRPs and secondary practices that will assist transitioning youth prepare for SE.

Recommended secondary practices for students with low-incidence disabilities currently emphasize the need to balance strategies for accessing general education classes with providing functional and community-based instruction, teaching self-determination skills, and using assessment and planning practices that increase interagency collaboration between schools, families and adult agencies (Inge & Moon, 2006). Researchers have identified some practices that may impact employment outcomes for transitioning youth with DD or low-incidence disabilities. For example, White and Weiner (2004) found a positive relationship between post-school integrated employment outcomes (SE) and the following: (a) integration in environments with same age peers who do not have disabilities, (b) community-based instruction, and (c) paid work experience while in school. Cunningham and Altman (1993) and Heal and Rusch (1995) found a relationship between self-management skills (e.g. hygiene, toileting) and employment outcomes.

Descriptive data on the outcomes of 50 workers with low-incidence disabilities who received SE services (Brown, Shiraga, & Kessler, 2006) also reinforced the importance of inclusive experiences, community-based instruction, and work-based experiences. Based on these findings, Brown and his colleagues recommended that educators employ the following secondary practices: (a) conduct and summarize authentic vocational assessments on the students for adult providers, (b) find paid employment sites for students before graduation, (c) decrease the amount of one on one instruction students receive in the community, and (d) teach skills, including transportation, to students 14 and older in community settings.

While we have evidence of secondary practices and interagency linkages that may impact employment outcomes from following up students with disabilities or surveying special educators, we do not have research that documents the secondary practices and experiences that staff from CRPs perceive as most valuable for transitioning youth with DD. Thus, we surveyed staff in CRPs to determine the skills and experiences they perceived as most important in preparing transitioning youth with DD to access SE services from CRPs. We sought descriptive information that would provide answers to the following questions:

1. What do transitioning youth with DD, families and educators need to know about eligibility and acceptance to CRPs that provide SE services?
2. What skills do transitioning youth with DD need to acquire in school in order to participate in SE?
3. What assessments and work experiences do CRP staff perceive as important for transitioning youth with a post-school goal of SE?
4. What suggestions does CRP staff have for transitioning youth with DD who have a post-school goal of SE?

**Method**

**Setting**

This exploratory study was conducted in one Mid-Atlantic state with a population of 5,633,597 (U.S. Census Bureau, n.d.). The
state is racially and ethnically diverse and most densely populated in the central, urban part of the state. A state developmental disability (DD) agency provides long-term funding for individuals (known as consumers) with DD and services are managed through four geographic regional offices. In 2009, this agency provided funding for day services for 10,000 consumers with DD including day habilitation (facility-based, non-work), day vocational (facility-based work related activities), and supported employment (integrated or community based employment including enclaves and crews).

 Despite a long waiting list for state DD funding, some transitioning youth who exit school at age 21 are eligible for earmarked funding and guaranteed services in day habilitation, day vocational, and SE. The DD agency anticipates funding 650 transitioning youth in SE and other day services for the 2010 fiscal year (C. Garuder, personal communication, May 13, 2009).

 Once transitioning youth (or consumers) are determined eligible for DD funding, a resource coordinator assists the consumer and family select a CRP to provide the services. The CRP develops and submits a service-funding plan to the DD agency outlining services and supports it will provide to the consumer; the DD agency then provides the funds to the CRP to support a consumer’s goals.

Survey Instrument

A survey was developed by the authors and revised initially based on feedback from 15 special educators at a statewide forum on the needs of transitioning youth ages 18-21. These special educators were involved in providing community based work experiences and in assisting transitioning youth access adult services. An executive director and SE director of a CRP then reviewed the survey. Their feedback regarding the clarity and usefulness of the items was incorporated into the survey. The revised survey was then administered in person to two other CRP staff who providing SE services and then final revisions were made to the survey.

The survey included questions about the CRP’s practices for recruiting and accepting potential individuals for services. Several open-ended questions and a rating matrix were used to identify the skills that participants perceived to be most important for accessing supported employment services. Participants were asked open-ended questions on the type of assessments and work experiences they perceived to be most important as transitioning youth applied for services from the CRP. The survey also included two open-ended questions regarding suggestions that transitioning youth, families and educators should consider during transition planning.

The survey also included a rating matrix titled “Checklist of Skills for Individuals Interested in Your Agency” for participants to rate a list of 59 skills that they perceived as important for transitioning youth. The skills were identified through a review of the literature on secondary special education and transition practices for students with DD (Inge & Moon, 2006; Noonan et al., 2008; Brown et al., 2006) and existing functional life skills curricula (Ford et al., 1989). The skills were arranged by the six domains from the Syracuse Curriculum Guide (Ford et al.). These included: vocational, general community functioning, self-management/home living, social and communication, recreation, and academic. Skills related to self-determination were included under the social and communication domain. Participants rated each skill on a three point Likert scale (1- critically important; 2- helpful but not essential; or 3- does not make a difference).

Participants and Procedure

Participants were staff members from CRPs who were involved in the agency’s recruitment and intake process of consumers and in providing SE services. To identify potential participants, the authors reviewed a list of all CRPs that were organized by the four geographical regions on the state DD agency’s website. We used the internet links to each CRP to determine if SE services were provided at the CRP. We then chose four CRPs from each region that provided supported employment and contacted the staff by phone to see if they would participate in our survey. Twelve CRP staff agreed to participate in the survey. At least two participants were from each of the
four state DD geographic regions were interviewed.

The survey was administered to the participants at each CRP by the first two authors and took approximately one to two hours to complete. Responses to the open ended questions were recorded on the instrument by the interviewer. Each CRP participant then independently completed the rating matrix along with demographic information on the CRP.

Data Analysis

Responses to the survey questions were tallied by the frequency of responses to each question. We then looked for common themes or additional topics that were brought up by the respondent during the open-ended questions. These comments were grouped together by themes by one author and then checked for accuracy by the other two authors.

The rating matrix required the participants to rate the importance of 59 skills in terms of importance to successfully transitioning to a CRP that provided SE options. In order to identify the skills and the domains that were considered most important to the respondents, descriptive statistics were used. First, the mean scores for each of the 59 skills across all participants were calculated and put in rank order from those rated as a “1” (most critical) to “3” (does not make a difference). After calculating the mean scores for each of the 59 skills and ranking them in order from most to least critical, the top 29 skills (those with a mean score above the median of 1.83) were identified. Next, we combined the mean scores for all of the skills within each of the six domains to calculate a mean score for each domain to determine which was considered the most critical domain. Finally, we wanted to see which skills within each domain were considered most critical. We identified the three skills that were rated as most critical (with the lowest mean scores) within each domain.

Results

The results of the survey are reported according to the research questions that guided this study of perceptions of CRP staff regarding transitioning youth with DD.

Eligibility and Recruitment

To address what transitioning youth with DD, their families, and educators need to know about recruitment and eligibility for SE services at CRPs, we asked participants what type of funding their consumers generally had prior to being accepted at a CRP, how transitioning youth and their families learned about the CRP, and what types of secondary vocational or work experiences were important for accessing SE services.

All participants indicated that the state DD agency provided primary funding for consumers at the CRPs. Several mentioned that this was, in fact, the only real requirement for determining a person’s eligibility for services. All participants indicated that funding from vocational rehabilitation was not critical to be accepted by the CRP. If a consumer did receive services through vocational rehabilitation, these monies were often used to pay for assessments and job development. One participant said, “[Vocational rehabilitation] funding is too short-term, we can’t count on it.” Participants also indicated that consumers could obtain funds for services through a state Medicaid Waiver. Consumers and their families had to apply for such a waiver through the DD agency. When asked how funding impacted service delivery at the CRP, participants indicated that the scope of services they offered to consumers were largely determined by funding levels.

In terms of secondary work experiences, all participants indicated that work experience was not essential for a transitioning youth to being accepted for services at the CRP. However, most participants (83%) said that previous work experience did impact initial employment placement once a consumer was accepted to the CRP. More than half of the participants indicated concern regarding parent’s expectations of the actual types of supports that were available to transitioning youth after they left the school system. One participant stated: “Some [families] do not want sheltered settings but the students don’t have any independent experiences.”

Five of the 12 participants stated that transitioning youth needed to understand that unacceptable behavior or poor personal hygiene during an interview was viewed negatively in
terms of accepting consumers for services. Another participant mentioned that families and educators needed to understand that once accepted to a CRP, excessive absences or non-compliance by the consumer could result in a loss of services.

Skills Critical for Supported Employment

Participants were first asked to identify essential skills that transitioning youth with DD should acquire before leaving school through open-ended questions. Responses included self-advocacy, self-determination, safety awareness, social skills, hygiene, communication, and travel training skills. Participants were also asked if there are specific behaviors that would keep an individual from receiving supported employment services from their respective CRPs. Responses included negative behavior, poor hygiene, poor safety skills, and toileting issues.

Participants were then asked to rate the importance specific skills using the rating matrix in the survey. The skill ranked most critical was “avoids/reports sexual abuse,” with a mean score of 1.17. The seven highest ranked skills were all from the self-management domain that included items such as “uses public and private toilets independently” and “has acceptable hygiene habits” (see Table 1). The 29 skills with a mean score above 1.83 (the median score for all skills) included skills from the self-management, general community functioning, social/self-determination/communication, and vocational domains (see Table 1) with no skills from the academic or recreation domains. Six of lowest ranked skills were from the recreation domain.

The two domains rated most critical were self-management, with a mean score of 1.51, and social/self-determination/communication, with a mean score of 1.54. The domains for general community functioning and vocational both had a mean of 1.78. The domains rated as least critical were academic, with a mean of 2.04, followed by recreation, with a mean score of 2.42. The three highest rated skills in each of the six domains are listed in Table 2.

Secondary Assessments and Work Experiences

We were interested in the types of assessments and information that CRP staff perceived as important when accepting and providing SE services to transitioning youth with DD. In terms of assessments, ten of the 12 participants indicated that it was most important to know individual employment interests and preferences. One participant said, “Each agency provides better in some areas than others, so if we know preferences, we can make a better match- we need to know preferences to make a good employment match!” However, only three participants reported that they received this information from the school or the family.

None of the participants had heard of or received a copy a summary of performance (SOP) document on transitioning youth exiting the school system. The SOP document, mandated by the Individuals with Disabilities Education Act (IDEA) of 2004, is supposed to summarize a student’s previous assessment information, goals, supports, and needs for the future.

In terms of collaborating with school personnel, participants reported they typically received copies of Individual Education Programs (IEPs) from schools as students transitioned to the CRP. All indicated a willingness to attend a student’s IEP meeting if invited by school personnel.

Participants were more interested in individual interests and employment preferences than in formal assessment reports or files. Nine of the 12 participants stated that they did not use formal assessments. Over half indicated that family members were more likely to report interests and employment preferences instead of hearing it directly from the transitioning youth. In terms of work history, eight participants indicated that they were aware of the employment history for some consumers. Two participants indicated this information was often “disjointed”; one indicated that they could sometimes “find the information in the records.”

Participants were asked how they assessed consumers’ interests, preferences, and strengths once accepted to the CRP. Four indicated through formal assessments while one indicated that this happened only if they ob-
tained funds from vocational rehabilitation for this specific person. Two mentioned they used job trials or situational assessments to determine a consumer’s interests, preferences, strengths, and needs.

The participants’ perceptions of unpaid work experiences during the secondary varied. Two participants indicated that unpaid work experiences assisted transitioning youth identify interests and preferences while exposing students to the realities of the workplace. One participant said, “The more experiences the better. Especially if someone has skills in the type of job they are interested in.” Several participants indicated that unpaid work experience should be used to help determine individual job preferences and that transitioning youth should be able to express these preferences when applying for services at the CRP. Three participants discussed their views on the limitations of work experiences that involved a “paid stipend” by the school system. They maintained that only pay from an employer was authentic and a good measure of the person’s ability to work in the community.

The importance of realistic work experi-

<table>
<thead>
<tr>
<th>Skill (Domain)</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoids/reports sexual abuse (SM)</td>
<td>1.17</td>
<td>1</td>
</tr>
<tr>
<td>Uses public and private toilets independently (SM)</td>
<td>1.21</td>
<td>2</td>
</tr>
<tr>
<td>Has acceptable hygiene habits (SM)</td>
<td>1.25</td>
<td>3</td>
</tr>
<tr>
<td>Manages menstrual care (SM)</td>
<td>1.25</td>
<td>3</td>
</tr>
<tr>
<td>Informs others when sick or injured (SM)</td>
<td>1.25</td>
<td>3</td>
</tr>
<tr>
<td>Washes hands at appropriate times (SM)</td>
<td>1.25</td>
<td>3</td>
</tr>
<tr>
<td>Avoids drugs/alcohol (SM)</td>
<td>1.33</td>
<td>4</td>
</tr>
<tr>
<td>Uses caution with strangers (GCF)</td>
<td>1.33</td>
<td>4</td>
</tr>
<tr>
<td>Responds to relevant environmental cues (SSDC)</td>
<td>1.36</td>
<td>5</td>
</tr>
<tr>
<td>Follows rules, guidelines, and routines (SSDC)</td>
<td>1.41</td>
<td>6</td>
</tr>
<tr>
<td>Crosses street safely (GCF)</td>
<td>1.42</td>
<td>7</td>
</tr>
<tr>
<td>Manages own behavior without instruction (SSDC)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Expresses preferences (SSDC)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Expresses needs (SSDC)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Expresses needs (SSDC)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Expresses needs (SSDC)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Can problem solve or use ID if lost (GCF)</td>
<td>1.46</td>
<td>8</td>
</tr>
<tr>
<td>Can express work preferences (V)</td>
<td>1.50</td>
<td>9</td>
</tr>
<tr>
<td>Participates in person-centered planning activities (SSDC)</td>
<td>1.55</td>
<td>10</td>
</tr>
<tr>
<td>Can use cell phone or pay phone (GCF)</td>
<td>1.58</td>
<td>11</td>
</tr>
<tr>
<td>Uses phone in emergency situations (SM)</td>
<td>1.58</td>
<td>11</td>
</tr>
<tr>
<td>Exhibits alt. strategies to cope with negative situations (SSDC)</td>
<td>1.59</td>
<td>12</td>
</tr>
<tr>
<td>Takes care of personal belongings (SM)</td>
<td>1.63</td>
<td>13</td>
</tr>
<tr>
<td>Makes choices from several alternatives (SSDC)</td>
<td>1.64</td>
<td>14</td>
</tr>
<tr>
<td>Has alternative communication system if unable to speak (SSDC)</td>
<td>1.64</td>
<td>14</td>
</tr>
<tr>
<td>Has had several real work experiences (V)</td>
<td>1.67</td>
<td>15</td>
</tr>
<tr>
<td>Terminates/withdraws from others appropriately (SSDC)</td>
<td>1.73</td>
<td>16</td>
</tr>
<tr>
<td>Takes medications independently (SM)</td>
<td>1.75</td>
<td>17</td>
</tr>
<tr>
<td>Shops for desired item at mall or department store (GCF)</td>
<td>1.75</td>
<td>17</td>
</tr>
<tr>
<td>Initiates interaction with others (SSDC)</td>
<td>1.77</td>
<td>18</td>
</tr>
</tbody>
</table>

Note. SM = Self-Management, SSDC = Social/Self-Determination/Communication, GCF = General Community Functioning, V = Vocational, A = Academic, R = Recreation

*Mean scores on a 3 point Scale include 1 = critically important, 2 = helps but is not critical, 3 = does not make a difference.
ences for pay during the secondary years and the ability for transitioning youth to express work preferences was reinforced throughout the interviews. Ten of the 12 participants indicated that previous paid work experience impacted initial placement at the CRP (SE versus facility based work). They indicated that transitioning youth who had paid work experience were more likely to be placed in paid employment positions upon acceptance to the CRP. These participants also indicated a willingness to keep transitioning youth in a paid employment position that had been obtained in school if: (a) the person indicated a preference for the particular job; and (b) transportation from the CRP or home to the employment site could be maintained or re-configured easily. All participants indicated that transitioning youth with paid work experience were easier to place in community employment opportunities.

Suggestions for Transitioning Youth, Their Families, and Educators

When asked to generate suggestions for transitioning youth with DD, families and educators to understand the realities of CRP services and SE, we found themes related to the differences between school and adult service systems, the importance of work experience, and the need to fade supports for transitioning youth during the final years of public school.

All participants discussed the importance of understanding the scope and limitations of the services available through a CRP. Several mentioned the importance of families understanding the differences between special education and adult services, especially transportation and scheduling. Specifically, they felt families needed to be open to discussing options for transportation and to be flexible with work schedules once their son or daughter

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Rank Order of Domains and Highest Rated Skills within each Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Self-Management Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Avoids/reports sexual abuse</td>
<td>1.17</td>
</tr>
<tr>
<td>Uses public and private toilets independently</td>
<td>1.21</td>
</tr>
<tr>
<td>Has acceptable hygiene habits</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Social/Self-Determination/Communication Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Responds to relevant environmental cues</td>
<td>1.36</td>
</tr>
<tr>
<td>Follows rules, guidelines, and routines</td>
<td>1.41</td>
</tr>
<tr>
<td>Manages own behavior without instruction</td>
<td>1.46</td>
</tr>
<tr>
<td><strong>General Community Functioning Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Uses caution with strangers</td>
<td>1.33</td>
</tr>
<tr>
<td>Crosses street safely</td>
<td>1.41</td>
</tr>
<tr>
<td>Can problem solve or use ID if lost</td>
<td>1.46</td>
</tr>
<tr>
<td><strong>Vocational Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Can express work preferences</td>
<td>1.50</td>
</tr>
<tr>
<td>Has had several real world work experiences</td>
<td>1.67</td>
</tr>
<tr>
<td>Has had a paid job</td>
<td>2.17</td>
</tr>
<tr>
<td><strong>Academic Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Can follow a command/ environmental cue to transition</td>
<td>1.83</td>
</tr>
<tr>
<td>Can read functional words such as “women, men, exit”</td>
<td>1.92</td>
</tr>
<tr>
<td>Uses predetermined amount of money to make a purchase</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Recreation Domain</strong></td>
<td></td>
</tr>
<tr>
<td>Can do a variety of activities alone (such as listen music)</td>
<td>2.17</td>
</tr>
<tr>
<td>Can use community recreation facilities</td>
<td>2.33</td>
</tr>
<tr>
<td>Can play games, cards, or has hobby such as arts and crafts</td>
<td>2.33</td>
</tr>
</tbody>
</table>

*Mean scores on a 3 point Scale include 1 = critically important, 2 = helps but is not critical, 3= does not make a difference; Rank = rank order of the 59 skills on the rating matrix.
was employed in the community. This generally meant the consumer would not necessarily work during "school day hours."

Three participants reinforced the importance of understanding the difference between unpaid (or stipend) work in school versus paid work experience in the community. One participant indicated that transitioning youth often came to the CRP with only enclave work experience so "parents come in and think that the consumer is ready for more than he/she is." Another participant felt families should understand that "consumers will not automatically make minimum wage; they should understand the concept of sub minimum wage."

In terms of suggestions for school system personnel, participants felt teachers needed to be knowledgeable about adult services and their funding sources and inform families about differences between special education and adult services. Specifically, the role of the parent needed to change as special education ends for the transitioning youth. Participants expected transitioning youth (not their parents) to identify employment interests and preferences, have transportation skills, and take charge of their planning process at the CRP. Ten participants also emphasized the importance of schools sharing authentic, realistic information about transitioning youth through resumes or a document that described work experience and preferences in detail (e.g., number of hours worked, amount of support needed, skills, paid versus unpaid placements).

Four participants also mentioned the need for transitioning youth and families to understand guardianship issues and suggested that educators needed to address this issue in greater detail at secondary transition planning meetings. Overall, participants suggested that educators assist families understand the expectations of adult services and teach transitioning youth to advocate and speak for themselves during the interview process as they select a CRP.

Discussion

This exploratory study provides insight into the types of skills and experiences CRP perceive as valuable for transitioning youth with a post school goal of SE. The results contribute to our knowledge base on how to best prepare secondary and transitioning youth with DD for adult integrated employment experiences. This perspective from adult service providers is largely absent from the secondary and transition literature and can serve as basis for future research.

Due to the small number of participants from only one state, the generalization of the results is limited. As well, the validity of the survey items was not established as it represented the ideas of the authors and teachers from one state that provided transition services to students with DD ages 18–21. However, survey items were based on a review of practices in the literature on interagency collaboration, employment options, and transition services to young adults with DD. The survey was also piloted and revised based on input from special education transition teachers along with CRP directors and SE staff.

Eligibility and Recruitment for CRPs

All participants emphasized that potential consumers needed to have long-term funding from the state DD agency or a Medicaid Waiver to receive services at CRPs. This finding is unique to our study and points to the need for educators and families to understand specific eligibility requirements for adult services and also to distinguish between funding from vocational rehabilitation (time-limited) and DD (on-going). In this state, educators and families had the benefit of a state funded mandate to provide seamless services to transitioning youth with developmental disabilities as they exited the school system. It was not clear from the literature review or our internet search how many states provide this opportunity for transitioning youth. However, it was important to note that having this seamless funding did not guarantee that a CRP would accept the transitioning youth for services or provide supported employment services. The need for transitioning youth, rather than their parents, to express employment interests and preferences, have paid work experience in school, understand employer expectations, possess good hygiene, and be able to use public or private transportation options...
was strongly considered in determining which consumers would be accepted at a CRP.

In terms of transitioning youth, families, and educators understanding the differences among CRPs, it is notable that the participants emphasized that funding levels determined the services available for an individual. It is also important to note seven respondents reported their CRP was in the process of changing the type of services provided from facility based work and community based work to only supported (or community based) employment services. It is crucial that families and secondary educators understand that transitioning with DD who are not adequately being prepared for community employment may not receive services from some CRPs. We believe that many educators and families are not aware of this changing service paradigm as they participate in secondary transitioning planning.

**Skills, Assessments, and Experiences for Supported Employment**

In terms of how to best prepare transitioning youth for adult SE services, the participants identified self-management and advocacy skills along with authentic work experiences, and meaningful assessments documented on a resume. These findings validate other studies that have identified practices that enhance employment outcomes for individuals with low-incidence disabilities (Brown et al., 2006; Cunningham & Altman, 1993; Heal & Rusch, 1995; Noonan et al., 2008; White & Weiner, 2004; Winsor & Butterworth, 2006). Findings from this study also highlight the importance of teaching transitioning youth self-management skills (e.g., avoids/reports sexual abuse, hygiene, toileting) and are similar to studies that have explored the relationship between self-management and employment outcomes (Cunningham & Altman; Heal & Rusch).

The importance of teaching functional, community based skills and self-advocacy skills to transitioning youth were also supported by this study. This finding is important as schools are currently focused on content standards and assessments to comply with the No Child Left Behind Act of 2001. For students, ages 18–21, with DD or low-incidence disabilities, it is important to rethink the experiences, skills, and delivery of instruction during their final years of public school. Our findings on the skills needed by transitioning youth provide support for those who have long advocated for age-appropriate, integrated community based experiences rather than academic instruction inside a classroom during students’ final years of public education (Gaumer, Morningstar, & Clark, 2004; Grigal, Neubert, & Moon, 2005; Neubert & Moon, 2006; Smith & Puccini, 1995; Tashie, Malloy, & Lichtenstein, 1998).

Participants in this study reinforced the importance of transitioning youth obtaining paid employment before leaving the school system and learning transportation modes that can be maintained after exiting school (Brown et al., 2006; Eisenman et al., 2009). A finding unique to this study was the impact of unpaid secondary work experience, a practice often used in secondary programs for students with low-incidence disabilities. Participants viewed unpaid work as valuable for initially identifying vocational interests and preferences. However, it was clear that they did not value work with pay from school stipends as a final or single work experience before transitioning youth exited school.

Participants expressed a desire for records such as a resume that summarized skills and work experiences succinctly. Nine out 12 participants felt the information or transition assessments received from the schools were inadequate. Defining and planning a student’s post school outcomes based on age-appropriate transition assessments is now a requirement of IDEA 2004. We need to understand, through future research, the barriers educators encounter when undertaking this process and how transitioning youth can present this information when they interview with adult providers.

An interesting finding was that none of participants were aware of the SOP that each student exits the school system with in this state. The SOP document, according to IDEA 2004 (and in this state), is supposed to document a student’s interests, strengths, preferences, needs and post-school goals. This document is meant to follow the transitioning student to the next provider (e.g., adult services, college) and to enhance communication between the school, families, transitioning youth, and adult providers (Izzo &
Kochhar-Bryant, 2006). Making this document useful and accessible to adult providers who work with transitioning youth should be explored through future research. Using information gained through ongoing transition assessments should serve as the basis for educators charged with constructing and updating the SOP document (Sitlington, Neubert, Begun, Lombard, & Leconte, 2007).

Suggestions from CRP Staff

Suggestions from our participants on how to better prepare transitioning youth for adult SE services are not new. Suggested practices support the literature on educating and empowering families and youth during the secondary years (Brown et al., 2006, Eisenman et al., 2009; Inge & Moon, 2006). Despite the focus on transition planning and interagency efforts in IDEA since 1990, our participants indicated that families of transitioning youth with DD generally do not understand the differences between special education services (entitlement) and adult services (eligibility and funding). CRP staff expressed a strong desire for secondary educators to teach transitioning youth with DD and their families the following: (a) the requirements for eligibility from DD agencies that fund services provided by the CRPs; (b) the changing and diminished role that parents should play as their son or daughter moves from special education to adult services; and (c) the need for transitioning youth to advocate for and choose services and employment options they desire as they transition from school to the community. Again, the literature and research on evidence-based practices on secondary special education and transition services has supported these recommendations for over 20 years, but our results bring into question their practice.

As half the participants noted that their respective CRPs may provide only SE services in the future, it is even more crucial that transitioning youth with DD, their families, and educators understand which behaviors and skills increase the likelihood of receiving services at particular CRPs. These skills include handling menstrual care, independent toileting, and hand washing, and avoiding sexual abuse, drugs and alcohol. While these skills have been targeted in functional curricula for some time (Ford et al., 1989) this study is unique in noting that a lack of self-management, social/self-determination/communication skills, and general community functioning skills may actually keep transitioning youth from receiving services at some CRPs. This may be an unspoken expectation on the part of CRPs or it could be that educators and families are not aware of the importance of these skills in light of the current academic demands due to the No Child Left Behind Act.

Our participants ranked the instruction of academic skills as minimally important to accessing CRPs and supported employment services. This finding is important for teachers and families who often are insistent that academic instruction be the primary focus of a student’s individualized education program during the final public school years. As Brown et al. (2006) asserted, we need to rethink how academics are blended with instruction of functional skills and focus on community employment beginning at age 14. The older the student is, the more this instruction must take the place of classroom-based academic instruction. The functional and age appropriate skills rated as important in our rating matrix certainly provide a place to start. Even more helpful to teachers and families is the fact that they are primarily derived from the Syracuse Curriculum (Ford et al., 1989) that can be used across all age groups for community-based instruction in conjunction with regular education standards and goals.

As SE services are primarily funded by state DD agencies and provided by CRPs, it is essential that transitioning youth with DD who have employment post-school goals, their families, and educators understand the eligibility criteria and the skills, assessments, and experiences that CRP staff perceive as important. Armed with this knowledge, students, families and educators can better prioritize what to include in the IEP for instruction that will best facilitate a smooth transition to adult SE services.

References

Agran, M., Snow, K., & Swaner, J. (1999). Teacher perceptions of self-determination: Benefits, char-
acteristics, strategies. Education and Training in Mental Retardation, 34, 293.


U.S. Equal Employment Opportunity Commission. (2004). Questions and answers about persons with intellectual disabilities in the workplace and...


Received: 23 July 2009
Initial Acceptance: 20 September 2009
Final Acceptance: 25 January 2010
Mediation between Staff and Elderly Persons with Intellectual Disability with Alzheimer Disease as a Means of Enhancing Their Daily Functioning

Hefziba Lifshitz and Pnina S. Klein
Bar-Ilan University

Abstract: This study presents a new way of mediation between staff and elderly persons with intellectual disability (ID) and Alzheimer type dementia (AD), i.e., the MISC (Mediational Intervention for Sensitizing Caregivers) model. The MISC was adopted for interactions between staff and adults with ID and AD based on observations of interactions between staff and adults with ID. The overall objective is to help caregivers and direct staff relate to their dependents in a way that will enhance their cognitive, emotional, and behavioral functioning. It is based on the integration of the person-centered approach, the cognitive rehabilitation approach (Clare, Wilson, Carter, & Hodges, 2003) and the mediational approach (Feuerstein & Rand, 1979; Feuerstein, 2003). The five mediational parameters can be applied during daily activity: meal and medication time, work sessions and leisure activities. The cognitive, emotional, and behavioral parameters of the MISC, including their rationale, aim, strategies, and examples of their implementation in a population of adults with ID and AD, are included. A case study describing the efficacy of the MISC as applied to a person with ID/AD is presented.

Israel mirrors the worldwide trend of an increasing number of adults with intellectual disability (ID) who survive to old age. Of the 6,122 persons with ID in residential care centers, 42.65% are aged 21–39; 37.5% are over 40 and 6.38% are 60 years or older. Of those who are 40 and above, 16.3% have Down syndrome. Of these, 5% suffer from dementia (Merrick, 2009).

One of the serious problems resulting from the increase in lifespan is a concomitant rise in cases of dementia of the Alzheimer type (DAT) among adults with/without Down syndrome. Estimates of the age-specific prevalence of dementia in adults with Down syndrome have varied widely, from under 10% to over 75% (Zigman, Schupf, Sersen & Saffiotti, 1996). Virtually all adults with Down syndrome over 35 to 40 years of age who have been autopsied exhibited key neuropathological changes characteristic of Alzheimer’s disease, including deposition of beta-amyloid in diffuse and neuritic plaques and neurofibrillary tangles (Frasher & Chung, 1996; Holland, Hon, Huppert, Stevens, & Watson, 1998; Malamud, 1972; Mann, Yates, & Marcyniuk, 1984; Wisniewski, Wisniewski, & Wen, 1985). This association appears to be due to a triplication of the gene for the beta-amyloid precursor protein (β-APP) which is located on the proximal part of the long arm of chromosome 21 (Goldgaber, Lerman, McBride, Saffiotti, & Gajdusek, 1987; Robakis et al., 1987; Rumble et al., 1989).

Alzheimer’s disease presents three stages (Schapiro, 1988). At first, only cognitive functions decrease, manifested as senility. Later there is deterioration in routine and vocational activities and behavior, characterized by dementia. Finally, there is deterioration in ADL skills functioning.

Most studies dealing with elderly persons with ID and AD focus on estimates of dementia in populations with ID, detecting the signs of dementia, the age of the onset of the disease (Janicki & Dalton, 2000) and the biological signs of dementia (Goldgaber et al., 1987; Robakis et al., 1987; Rumble et al., 1989).
Another issue that has been at the center of research interest is the development of diagnostic tools for identification of the disease (Burt & Aylward, 2000; Evenhuis, Kengen, & Eurlings, 1990; Frasher & Chung, 1996; Janicki, Heller, Seltzer & Hogg, 1996). Other studies focus on the stressors of the family caregivers or staff who take care of elderly persons with ID and AD (McCallion, McCarron, & Force, 2005). As far as we know there have been no attempts to relate to intervention or interaction between caregivers for persons with ID and AD in daily life. Our study aims to fill this void.

Cognitive Rehabilitation for People with Dementia

The concept of rehabilitation means ‘enabling people who are disabled by injury or disease to achieve their optimum physical, psychological, social and vocational well-being’ (Clare et al., 2003). This concept can be applied to people at different life stages and with different types of problems or disorders including people with dementia, especially in the early stages where changes in memory and cognitive functioning have a prominent impact on well-being.

Rehabilitation can focus on a range of different areas of need, and goals can be adjusted flexibly in response to changing needs. This is based on the understanding that despite difficulties with memory and other cognitive functions, people with dementia still have the ability to learn new associations and information, and to adjust their behavior and responses.

Cognitive rehabilitation aims to ‘enable clients or patients, and their families, to live with, manage, by-pass, reduce or come to terms with deficits precipitated by injury to the brain’ (Claire et al., 2003). Cognitive rehabilitation for people with dementia does not typically aim to cure or reduce impairment at the neurological level. Rather, it aims to find ways of dealing with the problems that arise as a result of cognitive changes, so as to enable the persons to participate in interactions and engage in desired activities as best they can, within their own personal and social context. This means that cognitive rehabilitation needs to identify specific strategies for dealing with difficulties resulting from changes in memory or other cognitive domains.

A key strength of the cognitive rehabilitation approach is that interventions are individually tailored and focus directly on real everyday situations and difficulties in a collaborative manner. The starting point involves identifying desired outcomes. This means that interventions focus on things that cause concern to the person with dementia and his or her family members or staff, and goals relevant to improving their quality of life. Specific interventions are then devised, based on an understanding of the profile of cognitive functioning that indicates both strengths and difficulties, taking into account the person’s preferred coping styles, other psychological and emotional needs, and support system.

Cognitive rehabilitation is also associated with the cognitive reserve concept. This term is defined as the ability to optimize performance by ‘recruiting’ alternative brain networks and reflecting the use of different cognitive strategies (Corral, Rodriguez, Amenedo, Sanchez, & Daz, 2006; Katzman, 1993; Scarmeas & Stern, 2003). This brain reserve capacity is defined in terms of the synapse count or brain volume. Recent studies show a positive relationship between brain size and cognitive functioning in pathological and healthy samples (Katzman).

Interaction between Caregivers and Persons with AD

Caregiver intervention studies among the general population have been conducted to address multiple negative outcomes such as emotional distress, burden and depression experienced by caregivers of adults with Alzheimer disease (Brodaty, Green, & Koschera, 2003). Most of these studies focused on the psychological emotional stress or skills needed for daily living (with only modest success, see Sorensen, Pinquart, & Duerstein, 2002). Research on family caregiving of persons with ID has been strongly influenced by stress and coping models (Lazarus & Folkman, 1984) which recognize that there are subjective as well as objective stress factors, that a variety of coping mechanisms may be effective, and that appraisals and resources may mediate. These
studies were anchored in the “Pearlin Model” (Pearlin, Mullan, Semple, & Skaff, 1990), which has emerged as most prominent in framing suggestions for avenues to assist families to cope more effectively. This model has supported the development of interventions to deal with behavioral problems, environmental modification to address the issues of increased dependency, and safety needs and outside support and education for reducing physical demands of care tasks (Schneider, Murray, Banerjee, & Mann, 1999). McCallion et al. (2005) adapted the Pearlin model for measuring stress and burden among caregivers of elderly persons with ID. It was found that staff caregivers experienced greater subjective burden than burden that has been reported for family caregivers.

A literature search in ERIC and PsycINFO (1995-2004) yielded attempts to implement intervention programs designed to improve the quality of the staff/residents’ interactions in facilities administering to adults with ID. These interventions focused on three major aspects: emotional components that could promote the residents’ emotional well-being (Golden & Reese, 1996; Leidy, 2004; Singh et al. 2004); social interaction, with a special focus on conversation between staff and residents (Kuder & Bryne, 1993); and strategies, aimed at improving the involvement of residents in daily activities (Felce et al. 1996).

The above interventions lack a holistic approach which encompasses emotional, behavioral, and cognitive components of the interaction. Furthermore, they focus on interaction between staff and adults with ID but not on elderly persons with ID, especially those suffering from Alzheimer type dementia. However, these interventions lack operative strategies, including mediation and interaction between staff and participants with ID and AD in daily life activities. This led us to advocate the MISC model: A new way of mediation between staff-adults with ID, and between staff-elderly persons with ID with and without dementia.

MISC—Mediational Intervention for Sensitizing Caregivers

The overall objective of the MISC (Klein, 1988, 2003) is to help direct staff or caregivers relate to their dependents in a way that will enhance their cognitive, emotional, and behavioral functioning. The MISC aims to provide caregivers with operative strategies, including mediations that are implemented during daily life activities. Based on the efficacy of the MISC among younger individuals (Greenspan & Weider, 1996; Klein, 1992, 2003), it has been applied to children with DS (Sobleman-Rosenthal & Klein, 2003) and PDD (Greenspan & Weider).

The essence of the MISC is sensitization and raising consciousness of key issues in the caregivers-adults with ID and AD relationship, i.e. trying to raise the caregivers’ awareness of their perceptions of the persons with ID, of themselves as caregivers and of the person’s emotional and cognitive needs. The five mediational parameters can be implemented during daily activity, i.e. meal and medication time, vocational time and leisure activities (Klein, 1992, 2003).

The MISC is an integration of three major theoretical frameworks:

Person-centered cultural approaches which emphasize individual identity and selfhood: The interaction with demented persons plays an important role by empowering their sense of self-identity and enhancing their feelings of being in control. Cultural attitudinal differences towards Alzheimer’s disease are taken into consideration when designing interventions between caregivers and persons with dementia.

Rehabilitation approach: The MISC adopted the cognitive rehabilitation approach (Clare et al., 2003) which aims to find ways to deal with the problems that arise as a result of cognitive changes of persons with AD, and to find strategies that would help these persons compensate and overcome memory loss and deterioration.

Mediational approaches (Feuerstein & Rand, 1974; Feuerstein, 2003): Klein’s (1992) mediational program is an outgrowth of Feuerstein’s theories of structural-cognitive modifiability and of mediated learning (Feuerstein & Rand; Vygotsky, 1978), emphasizing the importance of reciprocal relations between both parties in any interaction. Mediated learning, as distinct from direct learning through the senses, occurs when the environment is interpreted for an individual by another person.
The mediator is trained to take an active role in structuring meaningful components of that environment, as well as of past and future experiences. The above theories assume that the human organism is a system open to its environment and accessible to change, even in the presence of three obstacles believed to prevent change: age, etiology, severity of limitation (Feuerstein & Rand).

Klein (1992) identified five teaching parameters relating to cognitive, emotional and behavioral components necessary for creating experiences of mediated learning. These parameters were adapted by Lifshitz and Klein (2007) for interaction between staff and adults with ID with Alzheimer’s disease. The cognitive, emotional, and behavioral parameters will be presented, including their rationale, aim, strategies, and examples of their implementation in a population of adults with ID with/without AD.

The Cognitive Component

The cognitive component includes two parameters: focusing and cognitive expansion.

**Focusing:** Acts of the mediator directed toward affecting individuals’ perceptions or behavior referring to explicit or declarative memory (Cohen & Squire, 1980; Schacter & Tulving, 1994), i.e., remembering new events and facts becomes more difficult and even impossible for individuals with Alzheimer’s disease. Mediation plays an important role in helping them remember and recognize people, objects and events. Focusing includes selecting, accentuating, emphasizing, scheduling, grouping, organizing, sequencing, and naming in relation to objects, people, as well as time and space orientation.

Objects should be named and activities should be scheduled according to a definite and not a relative time. Rooms should be mapped using drawings (kitchen, bedroom, etc.) with precise directions, fixed location of objects such as watch, calendar, keys in ADL (activity daily living skills), leisure or other activities.

**Expanding: Transcendence**

**Rationale:** Behavior directed toward expanding cognitive awareness beyond what is necessary to satisfy the immediate need that triggered the interaction. This parameter is expressed by clarifying processes, attributing past and future needs to the present situation, critical interpretation, inductive/deductive reasoning.

Following the theory of cognitive reserve, cognitive enrichment among adults with ID cannot be reduced to one or two hours a week, but needs to be integrated in all daily activities. The aim is thus to insert literacy during daily life activities, i.e. mealtime, work session, leisure activities, etc even in a population with ID and AD.

**Example:** When persons with typical development sit in café or restaurant, the first part of the meal is devoted to reading the menu, talking about the nutritional composition, the contribution of the foods to health, the cooking and baking process and choosing the desired food. Experiencing knowledge of the food is an important part of the pleasure and the individual’s quality of life. Even when eating alone at home, a person is interested in the foods s/he is offered. However, observing a meal among adults with ID shows that there is no verbal interaction between the participants and between staff and their charges. On the contrary, the staff encourages them to eat quietly. Are we preventing our charges from doing what we do? Do we act contrary to the principle of normalization and the quality of life? Are we aware of the learning opportunity which our charges thus miss during daily activity?

Cognitive expansion is therefore derived from Wolfensberger’s (2002) principal of normalization and Schalock’s (1996) concept of life quality. It relates to expanding the knowledge of the current activity beyond the immediate need whether at mealtime (you are eating a tomato, a cucumber), during leisure activity (going to the sports club), relating to basic mathematical and scientific concepts (the pasta is round and shaped like the sun, the taste is sweet and sour). The staff should talk with the people with ID and AD, and should verbally or visually mediate these components for those who lack expressive language using pictures, word signs, and give them the opportunity to choose their preference from a written menu or from pictures.
Expanding the Communication Chain between Adults with ID and Their Staff

Rationale: A communication chain is defined as units of communication (verbal/nonverbal) that take place in one reciprocal sequence. Alzheimer’s patients have impaired declarative and episodic memory of recent facts, people, and events, while memories of the past are preserved (Fleischman, Wilson, Gabreili, Bienias, & Bennett, 2004). One of the causes of emotional burden for the caregivers of Alzheimer’s patients is the patients’ tendency to talk extensively of past events. The caretakers tend to stop the discourse with their loved ones.

Example: An attempt should be made by staff to expand the communication chain. This can be done by using the topic that was chosen by the individual for conversation, associate it to the past and to those of the present, and to expand the content of the discourse in terms of opinions, ideas, and world knowledge.

The Emotional Component

The emotional component includes three sub-parameters: Providing mediation of meaning (affecting), providing opportunities of choice making, and encouraging with explanation.

Providing mediation of affect relates to behaviors that express excitement, appreciation or affect in relation to the person in the interaction, other people, objects or processes. Kazui et al. (2000) found that emotional arousal may enhance declarative memory in patients with AD. Instructions and guidance given to patients with AD may therefore be easier to remember if emotionally aroused devices are used in intonation or other forms of expression.

Providing opportunities for choice making: Self-determination fulfills a basic human right and enhances the quality of life (Schalock, 1996). LeBlanc, Cherup, Feliciano, & Sidener, (2006) showed that choice preference for identifying items and activities increase engagement levels among clients in an adult daycare program. Providing opportunities for choice-making may contribute to the activities and behavior of individuals with dementia, would afford meaning to their life and would enrich their quality of life.

Encouraging or mediating feelings of competence relates to verbal/nonverbal behavior that expresses satisfaction with the individual’s behavior and identifies components of behavior contributing to that success. There are two ways of rewarding. One is to provide reward without explanation. This relates to careful timing of a gesture/verbal expression of satisfaction when the individual successfully completes a task or part of it, telling the reason for success (ADL, vocational, leisure activity).

Expanding and encouraging with explanation were found to be most predictive of cognitive performance of children with/without special needs such as Down syndrome (Klein, 1992, 1993; Soboleman-Rosenthal & Klein, 2002) and PDD (Greenspan & Wieder, 1996). The absence of this parameter from the staff-residents with ID interaction provides a poor “mental diet” for adults with ID and may prevent their benefiting from any learning experience.

The Behavioral Component: Regulation of Behavior

Rationale: Regulation of behavior relates to mediation of task performing through all stages of task analysis. A different pattern of performance emerges among persons with AD in implicit or procedural memory, when memory is assessed by performance of particular skills or acquiring new skills after training (Fleischman et al., 2004). Our observations of the interaction between caregivers and adults with ID and Alzheimer’s disease indicate that when patients tackle simple ADL or leisure skills, the caregivers give them physical assistance instead of guiding them on how to perform the task through the four stages of task analysis. This way of interaction prevents them from having the opportunity to internalize and assimilate the strategies of problem solving and transfer these strategies to similar tasks in the future.

We based the regulation of behavior on Gold’s (1978) four stages of task analysis: verbal instruction (i.e. “Use the spoon”), modeling (showing participants how to bring the spoon to the mouth with verbal instruction), practice (participants imitating the moderator) so that the behavior will be assimilated,
physical assistance (palm, hand, arm without imitation of the moderator).

In the light of the above, the questions posed by the present study were: (a) Are the MISC mediation parameters applicable in interactions between caregivers and persons with ID and AD? (b) What effects will using these parameters have on the quality of interaction between the caregivers and their relatives, on the cognitive, emotional and behavioral measures of the patients with dementia? An example of implementing the parameters with a person with ID who exhibits early signs of AD dementia is presented herewith.

**Implementation of the MISC with a person with ID and AD**

Jacob (54 years old), is a person with Down syndrome who was diagnosed with early-stage Alzheimer’s disease four years ago. He lived in an apartment with another four persons with ID for 10 years. However, when signs of deterioration appeared, he moved to a sheltered residence (hostel). He was independent in ADL skills, used to read and write, worked in supported employment and used to travel on a bus independently.

We used the Dementia Questionnaire for Mentally Retarded Persons (DMR) (Evenhuise et al. 1990) in order to determine the signs of dementia. The scale, which is based on DSM 3-R, includes 50 items in seven sections. The answers on each item are ranked on a 0–2 scale (0—exhibited no change in behavior in relation to the past and reflects independence, 2—exhibits great deterioration). The higher the score the greater the deterioration exhibited by the participant. Jacob’s profile in the seven sections of the DMR is presented below.

**Short term memory:** Jacob’s score in short-term memory was 3 out of 14. He tends to forget where he put something a minute ago, tends to forget where he put his personal things such as his glasses, watch, etc and does not remember special events that occurred last week.

**Long-term memory:** In this section his score was seven out of 16 (i.e. he does remember family members that he has not seen for a long time).

**Orientation in time and space:** His score was 6 out of 14. He forgets the days of the week and does not know which day it is today. He confuses the toilet and the bath. When walking on the streets he is in danger since he forgets to look at the traffic lights and crosses the street on red lights. The staff has a dilemma, since they are afraid to let him out on his own from the hostel.

**Speech:** His score was 1 out of 8, i.e. he functions well in this section and does not exhibit deterioration in this area.

**Practical skills:** His score was 3 out of 16. When taking a shower he sometimes puts his bathrobe over his clothes. He confuses between the hot and cold water taps and has become dependent in this area.

**Mood:** His score was 2 out of 12. From time to time he was readily upset, gloomy and sad.

**Activities and interest:** His score was five out of 12: he lost interest in outdoor activities such as parties, leisure activities, friends, etc. He has become more passive in the last years. He does not talk much and prefers to do things alone rather than with friends.

**Behavioral disturbance:** According to the scale he does not exhibit behavioral disturbances. However, the staff reported that when they went on their annual trip, he left the group and ran away.

In conclusion, according to the DMR, Jacob exhibits early signs of Alzheimer type dementia. Following Jacob’s deterioration, the staff exhibited a pessimistic approach dubbed by Feuerstein and Rand (1974) “passive acceptance,” according to which Jacob’s situation is irreversible and nothing can be done in order to change his function.

Based on the cognitive rehabilitation theory (Clare et al., 2003), a tailored program with the five parameters of the MISC was constructed in order to overcome Jacob’s weaknesses.

**Focusing:** This parameter was used to cope with Jacob’s deterioration in orientation in time and space and short-term memory.

**Time focusing:** We introduced Jacob to a calendar that he could consult whenever he wanted to know what day it was. A central part of the intervention involved getting Jacob into the habit of using his calendar. Following Clare et al. (2003), we positioned the calendar in a prominent place and the director of the community residence agreed to remind him...
to look at his calendar twice each day and find out what day it was. We marked the date and time of our meetings (every Sunday at 4 PM) in his calendar. His score on orientation in time on the DMR increased by two points.

**Orientation in space:** The close surroundings near Jacob’s room, i.e. the shower, toilet, dining room, and infirmary were indicated by word signs accompanied by pictures. After two weeks he no longer confused between the bath and the toilet and knew the location of these places. We set aside a drawer in his closet for his watch and labeled it. His score in this section increased by two points.

As stated, Jacob tends to forget to look at the lights when walking in the streets. When walking together the first author realized that he tends to look at his watch very often. Based on this observation it was decided to use this habit as a strategy in order to remind him to look at the traffic lights. A little sticker was pasted on his watch with the word “Light” in red. Looking at the watch reminds him that he has to look at the traffic lights.

**Cognitive expansion:** In the past Jacob could read and write his name. This was not the case now. We decided to re-teach him to read and write his name. We wrote his name several times in thick magic marker and asked him to go over the name, then to go over dashed line, then copy his name. After three weeks he could again write his name.

**Expanding the communication chain:** It was difficult to expand the communication chain with Jacob. The length of conversation with him lasted a few seconds. Based on the MISC approach it was decided to find his favorite conversation topics and keep the conversation for 3–4 minutes. He liked to talk about the security and political situation in Israel. We asked questions and developed the conversation. When the chain was interrupted, we directed the conversation, associated it to the past and the present and succeeded in drawing out the conversation for 3–4 minutes. His second favorite topic was money. We spoke about money, uses of money, opening a bank account, etc. We succeed in expanding the conversation to five minutes, then to 10 minutes.

**Mediation of meaning—providing opportunity for making choices:** We gave Jacob an opportunity to choose the activities we would do together, including walking to the nearest coffee shop, having a drink, and sitting together for half an hour, then walking back to the hostel, working on his name, talking, arranging his family album together. He chose the schedule. Furthermore, when Jacob wanted to walk alone without company we respected his wish and enabled him do so.

**Rewarding with explanation:** We taught the staff to explain verbally, the reason for rewarding. We realized that positive behaviors were repeated.

**Regulation of behavior:** To overcome his confusing the stages of showering, we made a flowchart of the washing (taking a shower) stages accompanied by pictures and words signs. We also put signs on the hot and cold taps. We instructed the direct staff to go over these stages with him before washing. After two weeks he stopped the habit of putting on the robe after the shower and put on his clothes.

As stated, we wrote his name on a card and wanted to paste it on his bedroom door. He did not know how to paste the scotch tape. We went through the stages of task analysis, explaining the task and asked him to pull the scotch tape, cut it from its stand, hold it with both hands on the two edges, and paste it. He did not succeed. We modeled the task and only then gave him physical assistance. After three times he could perform the task independently. We regulated his behavior in other tasks as well.

In conclusion, the efficacy of the MISC among adults with ID and Alzheimer’s disease that is currently available is drawn mainly from case reports and supports our claim that persons with ID and AD behavior can be modified and can re-learn skills that had been in their repertoire previously before the deterioration. Although Jacob’s memory difficulties remained, his daily life became a little easier and less stressful. Jacob was coping with the onset of dementia by facing up to its impact and trying to adapt. As described above, he showed numerous important strengths, including the capacity and motivation for learning new skills. This suggested that he was able to learn new strategies that compensate for his deterioration in short-term memory, orientation in time and space.

Following the MISC intervention, Jacob’s
score on the DMR increased by only four points. However, not all of these achievements can be measured. Clare et al. (2003) assert: “It cannot be assumed that any gains that might result from training would have any clinically significant impact.” The MISC is a holistic approach relating to areas that are not covered in the DMR. However, we succeeded in improving his function and enriching his quality of life. Following Clare et al., our aim was to modify Jacob’s functioning and improve his quality of life in the cognitive, emotional and behavioral perspective.

Limitations, Implications and Future Research

The limited evidence currently available on the efficacy of the MISC approach among persons with ID and AD is drawn mainly from case reports. Experimental designs will enable examination of the effect of the MISC approach on the behavioral, cognitive, and emotional skills of adults with ID and AD.

In his Social Role Valorization theory, Wolfensberger (2002) asserts that “SRV relies on educational and persuasive strategies that change people’s perceptions and expectations” (p. 253). Interventions aiming at altering the attitudes of professionals and paraprofessionals towards the modifiability of adults with ID should be implemented in all facilities of persons with ID.

References


Janicki, M. P., Heller, T., Seltzer, G., & Hogg, J.


Received: 23 July 2009
Initial Acceptance: 22 September 2009
Final Acceptance: 5 March 2010
Determining Alertness in Individuals with Profound Intellectual and Multiple Disabilities: The Reliability of an Observation List

Vera Munde, Carla Vlaskamp, Wied Ruijssenaars, and Han Nakken
University of Groningen, the Netherlands

Abstract: In the support of individuals with profound intellectual and multiple disabilities (PIMD), assessing the level of alertness is a recurring issue for parents and other direct support persons. Although observations show clear advantages above and beyond other assessment methods, there are problems related to this method as well. Subjectivity of interpretation and low reliability results have been described as the main problems. In the present study, our aim was to estimate the reliability of the Alertness Observation List (AOL) while, at the same time, minimizing the problems entailed in observations. We calculated both the inter-observer agreement and intra-observer agreement for 39 situations. Since the results exceeded the formulated 80%-criterion, we concluded that the AOL was a reliable instrument. However, the large range found in the results was striking. Moreover, observers with different information about the observed individuals came up with different reliability scores. To determine the value of observation of individuals with PIMD, it might well be necessary to judge the actual usefulness that the instrument has in clinical practice, besides the reliability of the results.

While stimulation to promote communication and learning is essential for the support of individuals with profound intellectual and multiple disabilities (PIMD) (Guess et al., 1993), direct support persons (DSPs) regularly wonder how to determine the “right moment” for starting such stimulating activities. By the same token, it is important for an activity to be started at the “right moment” so as to allow time for the stimuli that are presented to enter the consciousness of the individual with PIMD (Nelson, van Dijk, McDonnell, & Thompson, 2002). The “right moment” has also been described as “being focused on the environment” or as “being alert” (Munde, Vlaskamp, Ruijssenaars, & Nakken, 2009). The questions that arise, then, refer to a number of topics: How does an individual show that he or she is focused on the environment? How can individual differences in alertness signals be interpreted? Can we determine an optimal moment during the day for stimulation of an individual with PIMD? There is an additional problem in that research shows that reduced levels of alertness and quick, irregular changes in alertness levels over time are common for individuals in the target group (Guess, Roberts, & Guy, 1999). These factors may even aggravate the problem of determining alertness reliably in individuals with PIMD.

Despite agreement about the importance of determining alertness for the support of individuals in the target group, it is not obvious how different alertness levels ought to be determined. Since individuals with PIMD do not express their needs by means of spoken language, self-report cannot be used (Vlaskamp, 2005). Similarly, physiological measurements often show unusual patterns and do not reveal the necessary information about the complex behavior of individuals in the target group (Mudford, Hogg, & Roberts, 1997). In contrast, most authors do agree that alertness can be described in terms of observable behavior. Consequently, most instruments used to investigate and determine alertness in individuals...
with PIMD are based on observations (Munde et al., 2009).

Observations clearly have a number of advantages above and beyond other assessment methods for individuals with PIMD. As a consequence of the severity of their disabilities, individuals with PIMD are not able to use spoken language, and so they express themselves by means of body language. Consequently, individuals in the target group often cannot fulfill the requirements of standardized assessment instruments in terms of motor and speech abilities (Vlaskamp, 2005). The communication of individuals with PIMD mostly consists of subtle signals that are difficult to detect for DSPs (Wilder & Granlund, 2003). The same signal may have a different meaning for different individuals (Vlaskamp). While physiological measurements can help to register these subtle signals, the results do not reveal the necessary information about the meaning of these signals for individuals in the target group (Mudford et al., 1997). Looking at the individual’s reactions in different situations, DSPs can learn to interpret the different kinds of behavior (Grove, Bunning, Porter, & Olsson, 1999). Only observations allow DSPs to take the meaning of the individual’s behavior into account. Detailed registration of the behavior and, at the same time, of the influencing factors are especially important when observing individuals with PIMD.

However, general problems are related to observations in individuals with PIMD as well. Observations often lack an unambiguous description of their focus. When observations are based on theoretical concepts, these cannot be directly linked to visible behavior. Consequently, observers are forced to interpret the visible behavior, and ascribing meaning to behavior is, in turn, always interpretation (Vlaskamp, 2005). Interpretation, then, can be specified as yet another problem to do with observations. While it is important for DSPs to take the meaning of the behavior of their clients into account, several factors can bias the interpretation. DSPs interpret the behavior of the individual with PIMD based on their knowledge of the individual and previous experiences with the individual in similar situations. Since this knowledge differs for each DSP, observations of the same situation may result in different scores (Grove et al., 1999).

Additionally, general expectations of reactions and contextual factors in a specific situation can also influence the DSP’s judgment (Hogg, Reeves, Roberts, & Mudford, 2001). While DSPs’ overall judgments remain similar in situations with and without contextual information, DSPs judge the individual’s expressions more positively when they expect the individual with PIMD to enjoy an activity than when they do not know about the content of the activity. Furthermore, and as a consequence of the subjectivity of the interpretations, observations of individuals with PIMD regularly result in low reliability. As a result, researchers find themselves still involved in discussions about influencing factors and explanations (Vlaskamp).

The general problems that we experience in observations of individuals with PIMD also become apparent in the alertness observations of individuals in the target group. In the literature, no unambiguous description of alertness has been found (Munde et al., 2009). Although the authors all agreed that it was possible to observe alertness in the behavior of individuals with PIMD, different terms with different descriptions were found to have been introduced. Additionally, different scoring categories were used to determine alertness levels. Another point of discussion is scoring frequency. Because of quick and irregular changes in alertness levels, some authors plead the case for continuous scoring (Guess et al., 1999; Mudford et al., 1997). However, the difference in content information based on interval scoring is not yet made evident here, and, above all else, it should be remembered that interval scoring is actually more useful in clinical practice. To measure and compare the impact of these differences, researchers found themselves obliged to determine the reliability of their observations. For a number of the studies, reliability did not exceed the formulated criterion (Mudford et al.; Woodyatt, Marinac, Darnell, Sigafoos, & Halle, 2004). Although different explanations for these results have been discussed (Arthur, 2000; Guess, Roberts, Behrens, & Rues, 1998; Mudford, Hogg, & Roberts, 1999), no solution for the problem of low reliability in alertness observations has been offered.

Taking the above-mentioned problems into account, the Alertness Observation List (AOL)
has been developed accordingly (Vlaskamp, Fonteine, & Tadema, 2005). Within the AOL, a clear description of alertness is employed. Alertness is described as the “level” of being open to the environment. DSPs are thus able to use the AOL to formulate an individual alertness profile. Alertness is scored on four different “levels” in order to search for alertness patterns over the period of a day and to find out about changes in alertness based on the impact of different stimuli. Thereby, scoring frequency increases for each of the three subsequent scoring forms of the AOL.

The aim of the present study was to estimate the reliability of the AOL. In a previous study, the AOL was proved to be reliable in five cases (Petitiaux, Elsinga, Cuppen-Fonteine, & Vlaskamp, 2006). In the present study, we determined the general reliability of the instrument for a larger sample. In doing so, we strived to reach adequate reliability results while, at the same time, minimizing the problems with observations mentioned above.

**Method**

**Participants and Setting**

A Dutch school for special education volunteered to use the instrument. In this school, four classes were randomly selected. All 23 students of the four classes (12 girls and 11 boys) were included in the study. The children’s ages ranged from 6 to 16 years (M = 11, 57, SD = 3, 25). All the children could be described as individuals with PIMD. In addition to profound intellectual and profound motor disabilities (Nakken & Vlaskamp, 2007), individuals in the target group suffer from additional sensory impairments and a broad range of health problems (e.g., epilepsy, dysphagia, constipation, gastro-oesophageal reflux, Arvio & Sillanpää, 2003; Kapell et al., 1998; Van Schrojenstein Lantman-de Valk, van den Akker, Maaskant, & Haveman, 1997; Van Splunder, Stilma, Bernsen, & Evenhuis, 2006). For the children involved in the present study, the diagnoses included a number of different syndromes such as West’s syndrome and Battered Child Syndrome. For 60% of the children, no clear medical diagnosis had been formulated. Visual and auditory impairments were assessed in 57% and 13% of the children, respectively. Additionally, 22% of the participants suffered from epilepsy. For all the children, informed consent to take part in this study was obtained from their parents or legal representative.

To take into account the possible impact the observers’ knowledge might have and, as a result, to determine reliability as objectively as possible, the observations were conducted by three types of observers: teachers, an external observer who had received additional information about the children and an external observer who did not know the children with PIMD at all. All the observers were familiar with the AOL and were aware of the aim of the research.

**Instrument**

The Alertness Observation List was used to determine alertness. In the AOL, four “levels” of alertness are distinguished: 1) active, focused on the environment; 2) inactive, withdrawn; 3) sleeping, drowsy; and 4) agitated, discontented. Each “level” is assigned a color: green, orange, red and blue, respectively. More detailed descriptions of the different “levels” are given in Table 1. Four different forms are used to develop a complete alertness profile. The first form was completed before starting the observations. The overall state of the individual on the day before the planned observation and on the day of the observation itself was determined. If the individual had recently been ill or had had an unusual epileptic seizure the same day, observations were not conducted. The second form was used to observe an individual for three days, scoring alertness every 15 minutes, starting when the individual entered the school and stopping when he or she left. Before using the third form, DSPs first chose the optimal moment in a day for offering an educational activity to the individual. The stimulation was then presented for 15 minutes with the precondition that the score had to have been green or orange, thus that the individual had been awake during the preceding 15 minutes. The alertness “level” was scored every five minutes during the activity and for 15 minutes following that (Form 3). The fourth form was similar to the third one, except that the observer scored every 20 sec-
onds for a period of five minutes, during which the child was offered the activity. Finally, using all the information gathered on the observation forms, an alertness profile could be formulated and written down in a “traffic light.” This overall description of all the alertness categories of the individual was complemented with concrete examples of behavior for each category (Vlaskamp et al., 2005).

### Procedure

The AOL was completed for all 23 children. Since the first three forms of the AOL are conditional relative to Form 4, the fourth form is the one that is expected to reveal the most relevant information. Consequently, we have only included the observations of the fourth form in the present study. All observations using this form were videotaped. The observations were conducted in the classroom and in a multisensory room. In these two different settings, five and two observations, respectively, were completed for each child. A number of videotapes were excluded from the study because of the low quality of the recordings. The remaining pool of observations consisted of 120 situations.

To investigate the reliability of the AOL, 39 situations were randomly selected from the pool of 120 observations. For every situation, we asked two observers to score alertness for the individual with PIMD. Using the general formula for agreement, we estimated the inter-observer agreement. Since we investigated an individual judgment, a minimum value of 80% was applied in order to interpret the results (Mudford et al., 1997). Additionally, the intra-observer agreement was calculated for another 39 situations. The situations were again selected at random from

---

### TABLE 1

<table>
<thead>
<tr>
<th>Alertness “level”</th>
<th>Color</th>
<th>Description</th>
<th>Examples of behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active, focused on the environment</td>
<td>Green</td>
<td>The individual is engaged in sensory activities. That means he or she is</td>
<td>Open eyes, focusing with the eyes, turning the head or the eyes in the direction of a stimulus, the body is tensed, the individual is reaching or grasping an object, the individual is eating or drinking.</td>
</tr>
<tr>
<td>Inactive, withdrawn</td>
<td>Orange</td>
<td>The individual may be engaged in sensory or motor activities. These activities are not directed to the environment. Activities can be focused on the individual him/herself or without any focus.</td>
<td>Looking at one’s hands, stereotypical movements, sensing one’s clothes, staring, fiddling with one’s body, the head down or turned aside, thumb-sucking, groaning softly, rubbing the eyes, rolling the head, rocking him/herself.</td>
</tr>
<tr>
<td>Sleeping, drowsy</td>
<td>Red</td>
<td>The individual is sleeping. Movements and sounds correspond to sleep.</td>
<td>Sleeping, eyelids are shut, eyes are opening and closing slowly, snoring, limbs are limp and loose.</td>
</tr>
<tr>
<td>Agitated, discontented</td>
<td>Blue</td>
<td>The individual expresses discomfort.</td>
<td>Shouting, crying, screaming, hitting or kicking materials or persons, banging with the head, hitting, biting, scratching, or kicking himself or herself.</td>
</tr>
</tbody>
</table>
the pool of 120 observations. Observers were asked to complete the observation form twice for the same situation, six weeks apart. The same formula and the same interpretation criteria as for the inter-observer agreement were used to estimate and interpret agreement percentages.

Results

All 78 situations were scored using the fourth form of the AOL. Employing the general formula for agreement in order to calculate the inter-observer reliability for 39 of the situations, we found \( r = 81\% \) (\( Mdn = 81.44; M = 81.46; SD = 13.88 \)). The intra-observer reliability for the other half of the situations was \( r = 87\% \) (\( Mdn = 86.79; M = 85.23; SD = 11.75 \)). Although the median exceeded the formulated criterion of 80%, individual results showed large differences. Inter-observer reliability ranged from 50% to 100% with a standard deviation of 13.88. These results were similar to those for the intra-observer reliability that had a range from 61.11% to 100% and a standard deviation of 11.75. In addition, those observers who received more information about the children scored higher results for the inter-observer reliability, whereas the scores of the observer who did not know the children at all were higher for the intra-observer reliability. An overview of all the results including the percentages for each situation and each type of observer is presented in Tables 2 and 3.

Conclusion and Discussion

The present study does show that the AOL is a reliable instrument for determining alertness in individuals with PIMD. However, a number of details need to be discussed. Although the overall results of the present study are sufficient, the large range of results for the different situations is striking. The differences can be partially explained by the severity of the disabilities of the target group. One example of this is that visual impairments are common in people with PIMD, and so those in the target group with visual impairments most likely will not show their focus on the environment by directing their eyes or head. It is therefore difficult to determine their alertness levels. Another example is that uncontrolled movements of individuals with spasticity also aggravate alertness observations. When individuals are not able to show their focus by pointing or grasping, DSPs might well interpret the individual’s behavior as being “not alert.” The frequency of changes in alertness “levels” is another explanation for the large individual differences in reliability. When the individual with PIMD showed a clear focus during the entire observation, reliability was always 100%. In contrast, frequent changes in alertness “levels” were associated with lower reliability. As Guess et al. (1999) and Mudford et al. (1997) found in previous studies, the differentiation between orange and green alertness “levels” was especially difficult. Therefore, observations concerning situations with numerous changes between these two “levels” can lead to low reliability results.

Individual differences in terms of alertness expressions may also have an impact on the reliability of the results. Although observers are expected to take these differences into account, idiosyncratic behavior can aggravate observations of individuals in the target group (Hogg et al., 2001). Turning away the head may be an indication of dislike for the stimulus presented, but, by the same token, an individual with visual impairments may also express his or her interest in this way, especially as a reaction to an auditory stimulus. In such situations, the proxies’ knowledge of the children may be seen as an advantage in interpretation of their behavior. However, looking at the higher intra-observer reliability for the observer who did not know the children at all, we are obliged to amend this statement. Since external observers were not influenced by their knowledge about the child and recent experiences with the child, their observations were mainly based on the observable behavior and their interpretations were actually more consistent. However, there is no real standard for judging the correctness of the interpretations. Consequently, observations by proxies and external observers might well be used to greater advantage as complementary sources of information (Petry & Maes, 2006).

The present study has confirmed that observing individuals with PIMD reliably is an enduring challenge for DSPs and researchers. The subjectivity of the interpretations remains...
### TABLE 2
Results for Inter-Observer Reliability

<table>
<thead>
<tr>
<th>Observers</th>
<th>Situations</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T and E+</td>
<td>1</td>
<td>83.33</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>70.83</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>91.67</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>100.00</td>
<td>91.67</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>79.17</td>
<td>100.00</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>83.33</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>70.83</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>100.00</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>100.00</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>91.67</td>
<td>100.00</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>83.33</td>
<td>91.67</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
</tbody>
</table>

**Note:** The letters refer to the different types of observers. Teachers are designated by a “T,” the external observer who received additional information about the children is designated by an “E+” and the external observer who did not know the children at all is designated by an “E−.” The situations were not similar for the different observers.

### TABLE 3
Results for Intra-Observer Reliability

<table>
<thead>
<tr>
<th>Observers</th>
<th>Situations</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>1</td>
<td>70.83</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>91.67</td>
<td>91.67</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>100.00</td>
<td>100.00</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>79.17</td>
<td>79.17</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>70.83</td>
<td>70.83</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>100.00</td>
<td>100.00</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>91.67</td>
<td>91.67</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>83.33</td>
<td>83.33</td>
<td>12.15</td>
</tr>
</tbody>
</table>

**Note:** The letters refer to the different types of observers. Teachers are designated by a “T,” the external observer who received additional information about the children is designated by an “E+” and the external observer who did not know the children at all is designated by an “E−.” The situations were not similar for the different observers.
a threat to their reliability. Additionally, several practical problems aggravate the implementation of alertness observations for individuals in the target group. The scoring systems are experienced as being too complex for use in clinical practice. The observations themselves are found to be time-consuming as well and, therefore, often not practicable in day-to-day situations (Petry et al., 2006). However, based on the example of the AOL, we can conclude that reliable observations are in fact possible. While alertness observations remain an effort, DSPs also confirmed the importance of determining alertness in their clients. Furthermore, investigating the value of the results of the “traffic light” for DSPs may reveal additional information about the usefulness of the AOL in clinical practice.

References


Manual of the list 'Alertness in children with profound intellectual and multiple disabilities'. [Handleiding bij de lijst 'Alertheid van kinderen met zeer ernstige verstandelijke en meervoudige beperkingen']. Groningen: Stichting Kinderstudies.


Received: 18 August 2009
Initial Acceptance: 16 October 2009
Final Acceptance: 4 December 2009
Teaching Number Identification to Students with Severe Disabilities using Response Cards

Holly Skibo, Pamela Mims, and Fred Spooner
University of North Carolina at Charlotte

Abstract: Active student responding (ASR) has been shown to be an effective way to improve the mathematical skills of students. One specific method of ASR is the use of response cards. In this study, a system of least prompts combined with response cards was used to increase mathematical knowledge, and number identification, of three elementary students with significant disabilities (age range, 7–10 years, IQ range, >20-44) via a multiple probe design across participants. A functional relationship was demonstrated between student responding (increased number identification) and the implementation of the least to most prompting system. Maintenance checks, after the intervention was concluded, demonstrated that the skill level was sustained. Limitations and future research are discussed.

Students’ learning academic skills is a priority among all populations of students. Finding the educational experiences that are appropriate for each student is very important for educators (National Commission on Excellence in Education, 1983). In fact, Spooner, Dymond, Smith, and Kennedy (2006) suggest that over the past decade, accessing the general curriculum has become a major focus of investigators trying to build more effective educational systems for students with significant cognitive disabilities. Historically, students with severe disabilities have attended school with an emphasis on learning functional living skills (Browder et al., 2003; Brown, Nietupski, & Hamre-Nietupski, 1976). Until recently, the need for students to learn academic skills was not considered an important part of the curriculum (Browder et al.; Browder & Spooner, 2003; Browder, Spooner, Wakeman, Trela, & Baker, 2006). With the reauthorization of the Individuals with Disabilities Act (IDEA, 2004) all students with disabilities, no matter the severity of their disability, are required to have access to the general curriculum (IDEA). Not only is access required, but also students with severe disabilities must be assessed in grade level extensions of reading, mathematics, and science. Mathematics skills can often be complex to learn and for educators it is important that the right method of teaching be used. One way that teachers attempt to increase a student’s knowledge in mathematical skills is through active student responding (ASR).

Active student responding involves participating in class by asking and answering questions (Maheady, Michielli-Pendl, Harper, & Mallette, 2006). Jerome and Barbetta (2005) consider an “active student response as an observable, measurable student response to an instructional antecedent” (p. 13). This is a method of teaching that is used mostly by the general education teachers, but has started to be used by others. It is used to increase student learning in the general education classroom and has started to carry over to the special education classroom setting. Berrong, Schuster, Morse, and Collins (2007) demonstrated this by using response cards in self-contained special education to increase ASR.

Correspondence concerning this article should be addressed to Fred Spooner, UNC Charlotte, College of Education, Department of Special Education and Child Development, 9201 University City Blvd., Charlotte, NC 28223.
ing, it is important to look at methods of responding to include all students. The method in which a student responds also will play a key role in their academic success (Horn, Schuster, & Collins, 2006). One method of increasing ASR in students who are either nonverbal or who are severely limited in this regard is response cards (Berrong et al.).

Response cards are a teaching strategy that creates a non-judgmental learning environment for students. Heward et al. (1996) describe response cards as cards, signs, or other low tech items that are simultaneously held up by students in the class to display their response to questions presented by the teacher. Several studies have been conducted using response cards to increase ASR (Cavanaugh, Heward, & Donelson, 1996; Gardner, Heward, & Grossi, 1994; Heward et al.; Narayn, Heward, Gardner, Courson, & Omness, 1990). These studies report on the effects of response card use in the classroom. In addition, response cards have been used to increase academic responding for students with disabilities (Berrong et al., 2007).

One study that examined using response cards with individuals with disabilities was conducted by Horn et al. (2006). Specifically, the authors looked at using response cards to teach telling time to students with moderate and severe disabilities. The study was conducted with three middle school participants and took place in the student’s self-contained classroom where each student was given a laminated flip board that resembled a clock. The authors used an ABAB design to report the effectiveness of the students’ use of response cards. The results showed that response cards greatly influenced active student responding and also increased the student’s acquisition of telling time. Increasing ASR through response cards is one effective way to teach math skills, although investigators indicate the need to teach items systematically to students with severe disabilities.

One way to systematically teach students with severe disabilities is to use a system of least prompts. This strategy is beneficial when teaching concepts or skills. System of least prompts is a strategy that consists of a target stimulus, hierarchy of at least two prompts, and an opportunity for the student to respond independently (Ault, Wolery, Doyle, & Gast, 1989; Collins, 2007; Doyle, Wolery, Ault, & Gast, 1988). System of least prompts has been used to teach chained and discrete task to students with severe disabilities (Ault et al.; Collins; Doyle et al.).

One study conducted by Taber-Doughty (2005) focused on using a system of least prompts to teach the skills needed to use a copy machine and a debit machine. Participants included five high school students with mild to moderate mental retardation, although student attrition occurred with two students during the pre-training phase for various reasons. The study took place in the student’s domestic living area of their high school. Dependent variables in the study were student use of a debit machine to make a purchase and students ability to operate a large copy machine. The independent variable used to complete the purchasing and coping tasks were the system of least prompts, a self operated picture prompting system, and a self-operate auditory prompting system. An alternating treatment design was used to report the effectiveness of the prompting systems on skill acquisition. Results of the study indicated that all prompting systems were effective and efficient in the student’s ability to complete the two novel task and all students increased independence. In addition, outcomes showed that when the student had a choice they also increased in acquisition and decreased in duration for time to complete the task. Although this study used a system of least prompts to teach a functional skill, the system of least prompts also has been used to teach academic skills in the area of mathematics.

In another study, Colyer and Collins (1996) used natural cues within a system of least prompts to effectively teach using the next dollar strategy to four students with mild to moderate intellectual disabilities ages 12 to 15. The study took place in the coaches office of the students’ high school gym, with some sessions conducted in the classroom. The authors used a multiple probe across participants design to report the percentage of student’s correct response using the next dollar method. The method was taught using the system of least prompts by natural cues for prompting. The results of the study show that
there was a functional relationship between the system of least prompts and acquisition of the next dollar strategy for three of the four students. The three students were also able to generalize and maintain the next dollar skill. This study helps to effectively show that the system of least prompts can be used to increase money skills in a student with cognitive disabilities.

Even with all of the studies conducted on the effectiveness of response cards with students and the use of a system of least prompts when teaching a skill, research is limited in using a system of least prompts to teach using response cards for academic skills in students with severe disabilities. The majority of studies completed on response cards to increase active student responding have been with general education students. For example, Gardner et al. (1994) and Narayn et al. (1990) looked at using response cards in the general education classroom to increase the student’s participation and knowledge of a subject on the student’s daily quizzes. Currently, there is a lack of research using response cards specifically targeted to increasing math skills with students with severe disabilities. There are many studies looking at the effectiveness of using the system of least prompts to increase a students learning in academic areas; however, not many have focused specifically on math. For example, Karsh, Repp, and Lenz (1990) looked at using a system of least prompts to teach a word recognition skill to students with considerable cognitive deficits. In addition, Colyer and Collins (1996) did look at using a system of least prompts to increase math skills; however, it was with middle school age students and did not employ the use of response cards. To date, no research has combined the use of system of least prompts and response cards to increase mathematics skills in elementary students with significant cognitive disabilities. Therefore, the purpose of this study will be to address the paucity of research in this area by examining effects of response cards and a system of least prompts on numeral identification with elementary grade students with severe disabilities.

Method

Participants

Participants were three students with severe disabilities. Allison and Vicki attended the same class in one classroom for students with severe disabilities. The teacher of this classroom was appropriately licensed to teach students with significant disabilities. Two teacher assistants are also assigned to this classroom. Josh attended class in a similar classroom in the same school. This classroom also had a teacher with a license in severe disabilities and two teacher assistants. Classrooms are housed in a separate educational environment at a separate public school for students with severe disabilities. Allison was a 10 year old female with severe intellectual disabilities, and has an IQ of less than 20 with scattered skills. Josh was a 7 year old male student with multiple disabilities that has an IQ of 44. Vicki was an 8 year old female with multiple disabilities that has an IQ of less than 20. Students were aware that the numerals were numbers but could not independently identify the numerals presented on a consistent basis before the study took place. All students were able to make a distinct choice of two cards for answering of questions.

Setting

The setting was a separate public school in an urban area in the Southeastern United States. The intervention took place in the each student’s separate learning environment classroom. Allison and Vicki were in the same classrooms that consisted of small class setting with eight students. There were teacher assistants in each classroom to assist during the intervention. There was a section in each room with a table separate from other learning areas. This area of the rooms was set up to be less distracting than play areas in the room.

Materials

Materials used in the study consisted of response cards and were the same in the baseline and the intervention. Response cards for the students were preprinted. They were made on 5 in. × 7 in. cardstock paper. Numbers on the cards were printed in large black ink with nothing else on the card. They were laminated for durability during the study. The presenter’s cards were printed on a white 8.5 in. x 11 in. sheet of cardstock paper. Cards were also printed in large black ink in the
same font type as on the student’s cards. They also had symbols on them to represent numbers (e.g., three balloons, two hearts, etc) in addition to the number. These cards were also laminated for durability during the study.

**Experimenters**

Both classroom teachers served as the two experimenters that conducted this study. Both experimenters are highly qualified classroom teachers of each of the participants involved. Each teacher holds a teaching licensure in Special Education. The experimenters have had seven or more years of experience working with students with significant cognitive disabilities. Each experimenter was trained to mastery in the prompting system used in the intervention.

**Data Collection Procedures**

**Dependent variable.** The dependent variable was the number of correct response using response cards to answer mathematics questions on number identification for numerals 1–5. The participants had three cards each with a different numeral lying in front of them. The teacher said “show me number X (e.g., 4)” (the teacher did not hold up the card until the students have had a chance to respond). An independent response was coded as an “I” on the data sheet. The dependent variable was counted as incorrect if the student did not make a choice or picked the wrong number. In addition the prompting level required was recorded on the data sheet (i.e., V= verbal prompt, M= model prompt, PP= partial physical prompt, and FP= full physical prompt). Any prompt required was considered a prompted correct response and was not counted in the final total of correct responses. There was no prompting or assistance offered to the student in baseline as the prompting system used is the independent variable. The dependent variable was measured by using an event recording procedure. The experimenter marked the correct and incorrect responses for each session. The dependent variable was measured across all participants (see Table 1).

**Inter-observer reliability.** Inter-observer reliability took place during the baseline and the intervention phases. One of the researchers recorded participants performance every third session. The observers were trained to mastery in understanding what a correct, prompted, and incorrect response looked like and how to code each. Inter-observer reliability will be set at 90% or above. The gross method was used to calculate the reliability by dividing the number of agreements in a session by the number of agreements plus disagreements and multiplying by 100% (Tawney & Gast, 1984).

**Social validity data.** Social validity data were collected to measure the sound acceptability of the procedures and outcomes of the intervention. It was measured by a teacher and student survey. The teachers completed a questionnaire based on a rating scale at the completion of the study. The student also answered a very simple questionnaire by responding yes or no to each question in method that is familiar to the student (e.g., yes and no response cards on slant board).

**Experimental Design**

The experimental design was a multiple probe across participants (Horner & Baer, 1978; Tawney & Gast, 1984). Participants all started in baseline at the same time. Baseline data were collected for three sessions for Allison, with probes after the third session for Josh and Vicki. A session consisted of 3 trials; each trial presented the numbers 1–5 in random orders each time. There was a short wait time of 2 to 5 seconds depending on participants in between each trial. The participant who had the lowest amount of responses given and a stable baseline was the first one to receive the intervention. The intervention did not begin on the second participant until the first participant, already in the intervention, completed 3 consecutive sessions of at least 9 out of 15 correct responses. This was repeated for the next participant, and so on, until all participants were in the intervention stage. Students stayed in the intervention stage until they had successfully had four sessions of 11 out of 15 correct responses. Maintenance data was collected two weeks after the intervention phase ends. This was done by asking the student to use response cards to identify a number without any prompting.
**TABLE 1**

Data Collection for Math Response Cards

<table>
<thead>
<tr>
<th>Student ID</th>
<th>Assessor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Independently identifies first number after number is presented (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

2. Independently identifies second number after number is presented (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

3. Independently identifies third number after number is presented (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

4. Independently identifies fourth number after number is presented (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

5. Independently identifies fifth number after number is presented (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

6. Independently identifies sixth number after number is presented for a second time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

7. Independently identifies seventh number after number is presented for a second time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

8. Independently identifies eighth number after number is presented for a second time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

9. Independently identifies ninth number after number is presented for a second time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

10. Independently identifies tenth number after number is presented for a second time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

11. Independently identifies 11th number after number is presented for a third time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

12. Independently identifies 12th number after number is presented for a third time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

13. Independently identifies 13th number after number is presented for a third time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

14. Independently identifies 14th number after number is presented for a third time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

15. Independently identifies 15th number after number is presented for a third time (+ = correctly identifies; - does not correctly identify, NO=no opportunity)

**Prompt level used:** Verbal Model Physical and number presented

**Procedure**

**Baseline.** During baseline, data were taken every day for a minimum of three days. All participants entered baseline at the same time. Each teacher conducted two teaching groups in two separate environments consisting of 2 to 3 students each. Data was only taken on the participants. Allison was in group one with teacher one and 1 to 2 other students not participating in the study. Josh was in group two with teacher two and 1 to 2 other students also in room two who were not par-
Participants in the study. Vicki was in group one with teacher one and 1 to 2 students in room one who were not participating in the study. The participants were asked to come to a table and sit down with their group or taken by the teacher to the table. Each group participant had three response cards lying on the table in front of them. The teacher was directly in front of the students. The teacher informed the students that they would be asked to identify a number by holding up the card with the corresponding number, said by the teacher. The teacher said, “Show me number 4.” The students were given no more than five seconds to attempt an answer. No prompt or corrective feedback was given during baseline. Praise was offered after 5 seconds for any effort made during the trials. Baseline continued for all students until student one had stable data for 3 consecutive sessions. Each session consisted of 15 trials offering numerals 1–5 three times each to the targeted student.

Intervention. The intervention was the use of a least-to-most prompting system to teach students to make the correct response with the response cards. The teacher told them, “I will tell you a number and you need to hold up the card with a correct number 1–5 on it. The teacher would ask all of the students in the group “show me number 4.” The target student was given 5 seconds to make an attempt to answer the question by raising the correct card with the same number as the teacher has presented. When a student answered the question correctly the teacher would praise the target student. If the student started heading to a wrong response the teacher would block student’s response and redirect the student to the correct answer. If the student offered no response within the 5 seconds the teacher would move to a verbal prompt of “find the number that matches mine” and again wait another 5 seconds. If the student indicated the correct response after the verbal prompt the student was praised. If the student still provided no response the teacher would model “Which number matches mine?” and point to the correct answer and again wait five seconds for the students to respond. If there was still no answer from the student than the teacher would give the student a full physical prompt while saying “The number that matches mine is this one” while providing a descriptive response about the correct answer (e.g., “see my card has two balloons, one, two, and this card you have the number two, so this is the correct answer”). The wait time between each trial varied for each student. The intervention continued until the students have 11 out of 15 correct responses for 4 consecutive sessions.

Maintenance. Maintenance data were gathered two weeks after the students in the intervention phase had consecutive sessions of 11 out of 15 correct responses. The students were asked to respond to math questions of identifying numbers using response cards. They were not given any verbal or physical refreshers to help them recall the information.

Procedural fidelity. Procedural fidelity was gathered by one of the researchers each time inter-rater reliability was collected. A procedural reliability checklist was used to collect data on the exact steps the teacher used to teach the intervention in order to monitor the teacher’s steps in the intervention. In addition, procedural reliability was taken during the teacher training for the least-to-most prompt system.

Results

Agreement. Procedural fidelity for the implementation of the teacher training session was 100%. Teacher 1 had 95% procedural fidelity for implementation of the system of least prompts. Teacher 2 had 97% procedural fidelity for implementation of the system of least prompts of 97%. Interobserver agreement for the students’ responding was 95% for Allison, 97% for Josh, and 97% for Vicki.

Student data. Figure 1 shows each student’s independent correct responses for the numerical identification. During baseline, Allison correctly responded independently to the numerical identification with a mean of 4.6 correct out of 15 responses and a range of 4 to 6. After intervention, the responses increased ($M = 8.4$, range of 5 to 13). During baseline, Josh correctly responded independently to the numerical identification with a mean of 4.3 correct responses and a range of 3 to 5. After intervention, the responses increased ($M = 10.5$, range of 6 to 14). During baseline, Vicki correctly responded indepen-
Figure 1. Independent responses across students.
dently to the numerical identification with a mean of 4 correct responses and a range of 1 to 6. After intervention, the responses increased (M = 9, range of 4 to 12; see Figure 1).

Maintenance. Figure 1 shows each participant’s maintenance for the numeral identification. All three participants maintained their data during maintenance (i.e., M = 11.5 for Allison, M = 12 for Josh, and M = 11 for Vicki).

Social validity. The classroom teachers completed a social validity questionnaire. Results indicated that all teachers strongly agreed the teaching strategy improved the participant’s ability to answer without having a verbal response. In addition, teachers reported the study offered adequate preparation of presentation materials to students which created more consistent and correct answers. Finally, both teachers indicated that they would use this teaching strategy for other students in their class. One suggestion mentioned the desire for the response cards to be colorful and exciting to students.

Participants also contributed to the social validity outcomes. Overall participants reported that they enjoyed using the response cards. They all stated that they would enjoy using the response cards in other subject areas being taught.

Discussion

Participant data compiled from this study indicated that the effect of response cards and a system of least prompts increased overall numeral identification among students with severe disabilities. This is the first study to combine the method of ASR and the system of least prompts to exhibit increased numeral identification. In addition, this is one of the few studies to look at using a response card method with students with severe disabilities (e.g., Horn et al., 2006). Although, investigations of the effects of response cards on student responding are abundant, students with severe disabilities have been largely left out of this research. Additionally, this is one of the few studies to look at teaching a specific math skill to elementary students using both methods.

The findings of this study could be explained by the fact that the students were systematically taught the numeral identification through a system of least prompts while responding through the use of response cards. Colyer and Collins (1996) demonstrated in their study that students could effectively be taught mathematics skills through a system of least prompts. They successfully taught money skills to students by focusing on the system of prompts. As in this study, students were given the opportunity to answer with prompting when needed until the student could independently answer the task direction (i.e., presentation of the numeral and command to “find the one that looks like mine”) and the prompts were systematically faded over teaching trials resulting in skill acquisition. Students also demonstrated improvement in answering with the response cards, which is consistent with Berrong et al. (2007) when the authors suggest “response cards have positive effects not only in terms of increased students’ responding and accuracy of student’s responding, but also in an increased student academic learning” (p. 189).

It is important to note the possible limitations of the study. First, it only focused on a limited amount of numerals being taught. Students were only given the numerals 1 to 5 to learn with no addition of other numerals during the study. Teachers stated that students became satiated with exposure to the numerals after a period of time, which resulted in a decreased interest in the activity. During a teaching session, typically the students would be actively engaged in the activity, but engagement decreased after the fourth or fifth presentation of the teaching trail. Future research is needed that looks at the effects of this teaching strategy on additional numerals (e.g., 1–10) being presented to the students. Research is also needed on the use of this teaching strategy in other areas of math (e.g., greater than, less than; decimals) and other content areas such as sight words and sentence building.

A second limitation of the study was that there were only a limited number of students and, therefore, additional replications are necessary. Third, Allison had an extended absence due to illness and all students had a school production that interfered with consistent teaching of numerals. Fourth, the study
only took place in one particular setting of the student’s classroom. Future research is needed that allows for generalization of the skills that are being targeted to other instructors, other settings, and other types of response cards. In addition, this study also could be replicated using students with severe disabilities in grades other than elementary, focusing on the combination of response cards and a system of least prompts.

In conclusion this study adds to the limited research on the use response cards and systems of least prompts for students with significant cognitive disabilities. It offers insight to teaching students with severe disabilities specific academic skills through a system of least prompts. It also offers support to practitioners by providing a method of instruction that allowed students a new way of displaying their knowledge through active student responding (i.e., response cards). As more research is needed to sustain the strategy of combining the two methods to teach academic skills to students with significant cognitive disabilities, the results of this study should provide practitioners the information needed to use a system of least prompts combined with response cards in their classrooms to teach a variety of academic skills.

References


Kash, K. G., Repp, A. C., & Lenz, M. W. (1990). A comparison of the task demonstration model and the standard prompting hierarchy in teaching word identification to persons with moderate re-


Acquisition of Instructive Feedback:
Relation to Target Stimulus

Margaret Gessler Werts and Elin Meyers Hoffman
Appalachian State University
Cynthia Darcy
Watauga County School District

Abstract: We evaluated the addition of stimuli after the praise statement of a trial (instructive feedback) in which the stimuli were not attached sequentially to the target stimuli. All students reached criterion level responding of target behaviors despite the extra information presented, and three of four high school students with disabilities acquired many instructive feedback responses despite the presentation of the stimuli following any, rather than a given, target stimulus. The data leads to several conclusions: (a) The addition of unrelated instructive feedback revolving among the target stimuli did not impede the acquisition of the target behaviors, (b) The addition of unrelated instructive feedback revolving among the target stimuli did not preclude the acquisition of the instructive feedback information, (c) More information was acquired when more was presented after the praise statement of the instructional trial.

In recent years, there have been over 50 published studies on instructive feedback, a procedure designed to increase the efficiency of instruction by enabling students to learn more without an increase in instructional time. Using this procedure, a teacher will add extra information to the consequent event of an instructional trial (generally praise or another reinforcer). The student is not required to respond to the instructive feedback and if there is a response, the teacher ignores it. This addition to an instructional trial has been shown to be effective (Werts, Wolery, Gast, & Holcombe, 1995) with many direct instructional strategies.

A trial with instructive feedback may occur as follows: The teacher secures the student’s attention, presents the target stimulus and task direction, and provides a response interval. If the student responds correctly, the teacher reinforces the student and presents a second stimulus (i.e. the instructive feedback stimulus). Students are not expected to respond to this second stimulus and are not reinforced if they do. The stimulus presented is instructive feedback. Findings indicate that students taught using instructive feedback, when used in conjunction with a strategy of direct instruction with identified reinforcers and with multiple target behaviors being taught simultaneously, acquired a percentage of the behaviors presented. These results have been shown for preschoolers with disabilities, elementary-aged children with disabilities (learning disabilities, behavior disorders, mild and moderate intellectual disability, speech and language delays, other health impairments, and autism), and with typical development, and adolescents with intellectual disability and behavioral disorders. Teachers have been able to implement the procedure of delivering instructive feedback reliably in a variety of instructional groupings: one to one (Colyer & Collins, 1996; Werts, Wolery, Holcombe, Vassilaros, & Billings, 1992), small group instruction (Anthony, Wolery, & Werts, 1996; Johnson, Schuster, & Bell, 1996; Wolery, Alig-Cybriwsky, Gast, & Boyle-Gast, 1991), whole class instruction (Werts, Wolery, Venn, Demblowski, & Doren, 1994), and computer-assisted instruction (Campbell & Mechling, 2009; Edwards, 1989). Instructive feedback

Correspondence concerning this article should be addressed to Margaret Gessler Werts, Appalachian State University, 124 Edwin Duncan Hall, Department of Language, Reading, and Exceptionalities, Boone, NC 28608.
has been presented verbally, visually, and in combination (Caldwell, Wolery, Werts, & Caldwell, 1996).

The use of instructive feedback does not appear to interfere with the rapidity with which the target behaviors are acquired, nor does it substantially increase the length of the instructional sessions. Additionally, if used to teach information that is then taught in a future session, it results in a savings of time (Holcombe, Wolery, Werts, & Hrenkevich, 1993; Wolery, Schuster, & Collins, 2000). Students have acquired the information when (a) one stimulus is presented for each target behavior, (b) two stimuli are presented for each target behavior either simultaneously or on alternating trials (Wolery, Werts, Holcombe, Billings, & Vassalaros, 1993), and (c) when the stimuli are related and when they are unrelated to the target stimulus (Fiscus, Schuster, & Morse, 2002; Werts, Wolery, Holcombe, & Frederick, 1993). In small group instruction, students sometimes acquired some of their peers’ target and instructive feedback stimuli (Campbell & Mechling, 2009; Gast, Doyle, Wolery, Ault, & Baklarz, 1991; Gast, Wolery, Morris, Doyle, & Meyer, 1990; Keel & Gast, 1992). Use of specific attending cues (asking the children to repeat the task direction) appears to increase the probability of student learning their peers’ instructive feedback behaviors (Gast, Doyle, Wolery, Ault, & Baklarz, 1991). When instructive feedback is structured so that equivalent relationships can be tested, stimulus classes are sometimes formed. When acquisition of instructive feedback stimuli is less than 100%, students can learn the behavior more rapidly than behaviors not introduced in instructive feedback (Holcombe et al., 1993).

To this point, there have been few studies to indicate why the technique works. The instructor does not require and ignores any repetition of the instructive feedback stimuli. One might think that the response or acquisition of the behaviors would lessen or extinguish, but it does not appear to be the case. Several explanations have been proposed as reasons for the acquisition of instructive feedback behaviors. Among these are teacher demand qualities, observational learning, and the attachment of a target to a specific instructive feedback stimulus or stimuli. One study (Werts, Caldwell, & Wolery, 2003) looked at having instructive feedback stimuli revolve among target stimuli. Three instructive feedback behaviors revolved among three target behaviors within each set. The authors concluded students acquired instructive feedback responses although the stimuli were not assigned to a given target behavior/stimulus—indicating it is not necessary to assign each instructive feedback stimulus to a given target stimulus. However, in the Werts et al. study, three state outlines were assigned to three related sight words for reading. The related nature of the stimuli may have contributed to the acquisition of behaviors. In this study, we explored the feasibility of a greater number of instructive feedback stimuli that were unrelated to and revolving among the target stimuli across sets.

The research questions included (a) Will students acquire target behaviors if there is extra information in the consequent event of the trial? (In this study, there is three times the number of instructive feedback behaviors as target behaviors). (b) Will students acquire the behaviors presented as instructive feedback if the behaviors are not attached procedurally to the target behaviors? (c) Will students acquire behaviors presented as instructive feedback when given one exposure to the stimuli per session and given a different stimulus on each trial?

**Method**

**Participants and Setting**

Students involved in the study were four high school students in a rural county school. Each of the selected students had a different category label, but all were participating in an occupational course of study, which included an alternate assessment for graduation requirements.

Jackson was 18 years and 2 months of age and had been diagnosed with Down syndrome and an intellectual disability. A recent IQ test (WAIS-III) resulted in a full scale IQ of 57. Jackson’s WRAT-III scores yielded a reading score of 63 (grade equivalent = 2), a spelling score of 61 (grade equivalent = 2) and a math score of <45 (grade equivalent = 1). His IEP goals reflect a focus on occupational skill de-
velopment, including goals such as assignment completion, money identification, forms and application completion, and learning vocational words. He currently spends all of his academic day in special educational programming.

Maddox was 17 years and 5 months of age with a diagnosis of autism. His IEP states he can read words at a third to fourth grade level, and his goals focus primarily on increased use of language and vocabulary. Additional goals call for responding to requests and questions, asking for clarification when needed, and presenting appropriate amounts of money to a cashier. He participates in inclusive general education only for music and art classes.

Madelyne was 17 years and 10 months of age with diagnoses of developmental delay as well as speech/language impairment. Her health history includes a brain abscess, and testing with the Griffiths Mental Development Scales (Griffiths, 1970) during preschool indicated a 25% delay in Madelyne’s developmental trajectory. She was placed in special education in 1995, but was served in the general education classroom until the current school year. In grade 10, she failed the end of grade exams in math, English, algebra, biology, and writing which resulted in a full-time placement in classes in the Occupational Course of Study (OCS). Her communication skills as measured by a recent Vineland Behavior Scale suggest that Madelyne’s communication skills are in the borderline range. As a result, her current IEP goals focus on increasing her understanding and use of vocabulary and language in all environments.

Wyatt was 16 years and 11 months of age with a diagnosis of a specific learning disability. He also has a history of seizure disorders. Wyatt began his education in public school, but was home-schooled for two years during his middle school years. Prior to entry into high school, he was referred for special education testing by his parent, who indicated that Wyatt had difficulty acquiring knowledge. He was administered the Wechsler Intelligence Scale for Children-IV (WISC-IV) resulting in a full scale IQ of 74. (VIQ = 69, PSI = 78, WMI = 80, PRI = 92). He is in special education classes with the exception of his horticulture and construction classes. Wyatt’s records indicate that he struggles with poor short term memory and has difficulty generalizing skills. His IEP goals are primarily related to the development of functional literacy skills and functional writing skills.

Entry level skills for participant selection included (a) parental or guardian permission, (b) adequate visual and auditory skills to attend to stimuli, (c) verbal and imitative ability sufficient to participate in class, (d) ability to follow directions, and (e) ability to wait up to 5 seconds for a verbal prompt. None of the selected participants had experience with constant time delay or instructive feedback.

The sessions were conducted in a classroom in a rural high school by the classroom teacher or an investigator. The students were enrolled in a special education social sciences class with five students, a teacher, and an assistant. The instructor stood at the front or side of the desk area and the students were seated in individual desks during sessions. Wyatt was not included in data collection at the beginning of the sessions. He was added later when his attendance improved. The fifth student opted out of participation in the study but participated in the group when he attended. He was assigned different stimuli, and his data were not collected. Time for instruction included all students so it is inflated reflecting the time for all five students.

Targeted Skills and Materials

Target stimuli were definitions of vocabulary words from the students’ textbook (Pace-maker Skills, 2002). Definitions from the text were taken verbatim. The definitions were written on white 5 in × 7 in index cards. The teacher read the definition to the student with the last word (target) omitted. The student then finished the sentence with the target word. No visual prompt was used. The stimuli for each student are shown in Table 1. For instructive feedback stimuli, students heard a fact from the study materials for the citizenship test from the U.S. Citizenship and Immigration Services (USCIS) http://www.uscis.gov/files/nativedocuments/M-623_reversed_colors.pdf. The sentences were printed on 5 in × 7 in white index cards. On the reverse, so it could be seen by the student, was a word written that summarized the response. For instance, the sentence read by the teacher was
“John Roberts is the Chief Justice of the Supreme Court.” The reverse of the card, seen by the student, read, “John Roberts” printed in black ink in Times New Roman type in 36 point font. The sentences and the student stimuli are shown in Table 2.

Response Definitions and Data Collection

During probe sessions, the instructors recorded the responses of the study participants to the words following statement of the definitions and the civics questions with three types of responses: a) unprompted corrects, b) unprompted incorrects, and c) no responses. Responses were recorded verbatim. During instructional sessions, the responses for each trial were collected in five categories: a) prompted corrects, b) unprompted corrects, c) prompted incorrects, d) unprompted incorrects, and e) no response.

Screening and Probe Procedures

Prior to instruction, all students were screened to ensure they had the prerequisite skills for the study. The classroom teacher probed students individually for knowledge of 50 selected vocabulary words and responses to 100 civics questions. For the target material, the teacher read the word and asked the definition and waited for the student to respond. For the instructive feedback material, she read the question and waited for the student to respond. Verbal praise was given for correct answers and incorrect answers were ignored. After the initial screening, the investigators chose definitions and civics questions unknown by individual students and re-screened each student to determine a list of six words and 18 civics questions whose correct responses were unknown. A behavior was selected for

Table 1: Target Stimuli

<table>
<thead>
<tr>
<th>Target Stimuli</th>
</tr>
</thead>
</table>
| **Jackson** Set 1: Money everyone who works pays to the government is . . . income tax  
A fee you pay to borrow money is . . . interest |
| **Madelyne** Set 1: A summary of your education and work experience is called a . . . resume  
A company policy on what employees can wear is called a . . . dress code  
Money that renters pay in case they damage the housing is called a . . . security deposit  
A person who agrees to pay for someone else’s bill is a . . . co-signer |
| **Maddox** Set 1: When you write your name on the back of a check you . . . endorse it  
Money you pay an owner to live a certain place is called . . . rent  
Someone who buys things is a . . . consumer  
People who know you well and will tell employers that you are a good worker are called . . . references |
| **Wyatt** Set 1: A written promise that a product will work for a certain amount of time is a . . . warranty  
A business that puts together credit reports is a . . . credit bureau  
A department of a certain office that works on issues is an . . . agency  
A legal request is a . . . summons  
Food that provides your body with what it needs to stay healthy is a . . . balanced diet  
A sign of illness or disorder is a . . . symptom |
inclusion as stimuli if the student had performance at 0% correct responding.

The investigators conducted three 1:1 target sessions and three 1:1 instructive feedback sessions with each student during each probe condition to determine acquisition of vocabulary words and civics information. Full probe conditions occurred prior to teaching each vocabulary set and after each student met criterion in a set. The investigator orally stated the definition for the vocabulary word (e.g., "An order for medicine a doctor provides is a . . ."). and waited 4 seconds for the student to respond. Correct responses within 4 s were reinforced with verbal praise. Incorrect responses or no responses within 4 s were ignored and the teacher presented the next trial. The targeted vocabulary words were queried three times each.

Probes for instructive feedback material were separate from the target probes but the two probes were given sequentially and counterbalanced for order. The items introduced in the consequent event for the trials in the current set and taught sets were tested three times per probe session. Others were probed once per probe session. Each instructive feedback probe session was conducted as follows: the investigator had the questions ready and alerted the student to the task (i.e., Are you ready for the questions?), orally stated the question (e.g., "Who is the Chief Justice of the Supreme Court?"), and waited 4 s for the student to respond. Correct responses within 4 s were reinforced with verbal praise. Incorrect responses or no responses within 4 s were ignored and the teacher presented the next trial. Students’ attention and cooperation were verbally reinforced intermittently throughout the session and at the end of each session.

**General Procedure**

A 4 s delay constant time delay (CTD) procedure was used to teach four high school aged students vocabulary from their social studies curriculum. Each student was exposed to civics information as instructive feedback. The teacher and the investigators conducted the sessions in a group format within the class. A fifth student was included in the teaching sessions. One massed trial training session oc-

<table>
<thead>
<tr>
<th>Stimulus statement</th>
<th>Visual for student</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Electoral College elects the president of the US</td>
<td>Electoral College</td>
</tr>
<tr>
<td>Changes to the Constitution are amendments</td>
<td>Amendments</td>
</tr>
<tr>
<td>Congress makes federal laws</td>
<td>Congress</td>
</tr>
<tr>
<td>There are 100 senators in Congress</td>
<td>100 Senators</td>
</tr>
<tr>
<td>Senators are elected for 6 years</td>
<td>6 years</td>
</tr>
<tr>
<td>John Roberts is the Chief Justice of the Supreme Court</td>
<td>John Roberts</td>
</tr>
<tr>
<td>There are 27 amendments to the constitution</td>
<td>27 Amendments</td>
</tr>
<tr>
<td>There are 435 representatives in the House</td>
<td>435 representatives</td>
</tr>
<tr>
<td>Patrick Henry said, “Give me liberty or give me death”</td>
<td>Patrick Henry</td>
</tr>
<tr>
<td>Thomas Jefferson wrote the Declaration of Independence</td>
<td>Thomas Jefferson</td>
</tr>
<tr>
<td>The Cabinet advises the President</td>
<td>Cabinet</td>
</tr>
<tr>
<td>The Constitution was ratified in 1787</td>
<td>1787</td>
</tr>
<tr>
<td>The Governor of North Carolina is Beverly Perdue</td>
<td>Beverly Perdue</td>
</tr>
<tr>
<td>The introduction to the constitution is the Preamble</td>
<td>Preamble</td>
</tr>
<tr>
<td>The Bill of Rights is the first 10 amendments</td>
<td>10 Amendments</td>
</tr>
<tr>
<td>You must be 35 years old to run for President.</td>
<td>35 years old</td>
</tr>
<tr>
<td>Francis Scott Key wrote the Star Spangled Banner</td>
<td>Francis Scott Key</td>
</tr>
<tr>
<td>The most important right granted to citizens is to vote</td>
<td>To vote</td>
</tr>
<tr>
<td>The speaker of the House of Representatives is Nancy Pelosi</td>
<td>Nancy Pelosi</td>
</tr>
</tbody>
</table>

**TABLE 2**

**Instructive Feedback Stimuli**

---

curried each day school was in session and the students were in class. Probes were conducted before training on the first set of stimuli and after each student reached criterion (three of four sessions at 100% correct responding). Instructive feedback was added in the consequent event (praise statement) of trials that resulted in correct student responding either before or after a prompt. Incorrect responses were ignored.

**Instruction**

Each student was taught three sets of vocabulary words (two words at a time). Each student had six trials per session (3 per word) with the addition of instructive feedback information on each trial. Six separate pieces of instructive feedback information were added per session per student. The instructive feedback information rotated among the target stimuli so that it was not attached to any stimulus. Therefore, each student heard his or her instructive feedback information once during a session. The first three sessions of each vocabulary word set were at 0 s delay for three of the students. Because Wyatt started later in the school year, the first two, instead of three, sessions in each set were at 0 s delay.

After initial sessions, all sessions were conducted with a 4 s delay interval. The instructor called the student’s name, delivered the task direction (the definition of the word) and waited for the response of the vocabulary word. If the student responded correctly, it was scored as an unprompted correct, if the student waited for assistance and then responded correctly, it was scored as prompted correct, if there was an error, it was scored as incorrect either before or after the prompt. If the student did not respond, it was scored as a non response. Following correct responses, the instructor praised the student, delivered the instructive feedback information, and then proceeded to the next trial. Following incorrect responses, the instructor ignored the response and proceeded to the next trial. Criterion level responding was defined as three out of four days at 100% unprompted correct responding. Because training sessions were conducted within the group and individual criteria were used, students were in different conditions at different times.

For the first set of vocabulary words, the instructive feedback information was the same for three of the students. After the first set, the information differed. For Wyatt, the information was different for all three of his sets because he was present during occasional sessions prior to initiating his experimental sessions.

**Experimental Design**

A multiple probe design across social studies vocabulary sets and replicated across three students was used to assess the effectiveness of constant time delay for teaching expressive identification of a word when given the definition. Percent of correct responses during instructional sessions and probes acted as the dependent variable. Constant time delay with the addition of instructive feedback not tied to a target stimulus was the independent variable. Experimental control was established when the student, who was responding at or near to zero during full probe conditions before the intervention, reached criterion level responding in the intervention sessions (Wolery, Bailey, & Sugai, 1988). Reliability data were collected for 32% of the sessions by an investigator (first or second author). Dependent measure reliability was calculated using a point by point method (Tawny & Gast, 1984) and was 100% across all sessions. Data on procedural fidelity (Billingsley, White, & Munsin, 1980) was collected during 71% of the sessions and was calculated by dividing the number of expected teacher behaviors by the number of planned teacher behaviors and multiplying by 100 resulting in a percentage. The specific behaviors were delivering an attention cue, presenting the stimulus, delivering the task direction, waiting the planned latency, delivering the prompt, delivering the consequence, presenting the instructive feedback stimulus, and waiting the inter-trial interval. Average agreement was 99.8%.

**Results**

Percentages of correct responses for each target behavior set are shown in Figures 1 through 4 for Jackson, Madelyne, Maddox, and Wyatt. Prior to instruction, student performance for each student was at 0% correct.
All students met criteria levels for target behaviors after instruction indicating that constant time delay with the addition of a different stimulus of instructive feedback for each trial was effective. Three students maintained the level of performance through three sets of target behaviors. Maddox had less than 100% performance for Sets 2 and 3 during probes. One additional session of instruction on Set 2 target behaviors boosted his probe performance to 100 percent. Review sessions for Set 1 behaviors were used for Jackson because he consistently missed one of the target behaviors in the probe sessions following Set 1 instruction. The number of sessions and percentage of errors for each student are shown in Table 3. The mean number of sessions per word pair for all four students was 7.4. The sessions took

Figure 1. Percent of unprompted (closed triangles) and prompted (open circles) correct responses for Jackson during probe and intervention sessions. Closed diamonds mark review trials.
an average of 3 minutes 40 seconds with a total instructional time of 5 hours and 53 minutes. The number of errors made during instruction was minimal with 12 for all four students in 96 sessions (576 trials) or 3.125%. Maddox had 6 errors (4%), Jackson committed 6 errors (6.3%). Wyatt and Madelyne were error free.

The percentage of correct responses for individual instructive feedback behaviors are shown in Table 4 and Figures 5 through 8. Before instruction, the students had no correct responses. After instruction, mean correct performance for Jackson, Madelyne, and Wyatt during probe conditions was 46.4%, 64.7%, and 84.3% respectively. This level of responding is consistent with responding levels (approximately 58% overall) reported in
Discussion

In this study, a multiple probe design was used to evaluate the effectiveness of teaching definitions for vocabulary words to high school students enrolled in an occupational course of study. The research questions included (a) Will students acquire target behaviors if there is extra information in the consequent event of the trial? (b) Will students acquire the behaviors presented as instructive feedback if the behaviors are not attached procedurally to the target behaviors? (c) Will students acquire
behaviors presented as instructive feedback when given one exposure to the stimuli per session and given a different stimulus on each trial?

Several conclusions can be drawn from the results. First, in agreement with prior investigations in the research literature, the CTD procedure appears to be effective for teaching students a discrete skill, (Campbell & Mechling, 2009; Collins, Branson, & Hall, 1995; Werts et al., 2003; Whalen, Schuster, & Hemmeter, 1996; Wolery et al., 2000) in this case,
to state a word when given the definition. All students acquired the behaviors taught. The teacher implemented the task with a high degree of procedural fidelity, and, as in similar studies, the error rate was minimal. The nature of the instructive feedback (unrelated) to the target was not a hindrance to acquisition of the target information. This is to be expected following studies that show similar results with unrelated or novel stimuli (Fiscus et al., 1995).

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Student} & \text{Set} & \text{Number of Sessions} & \text{Number of Errors} & \text{Percent of Errors} & \text{Minutes in Instruction} \\
\hline
\text{Jackson} & 1 & 7 & 0 & 0\% & 25.39 \\
& \text{Review} & 2 & 4 & 7.4\% & 34.29 \\
& 3 & 5 & 8.9\% & 31.54 \\
& \text{Total} & 32 & 12 & 5.8\% & \\
\text{Madelyne} & 1 & 7 & 0 & 0\% & 29.55 \\
& 2 & 6 & 0 & 0\% & 27.27 \\
& 3 & 7 & 0 & 0\% & 30.25 \\
& \text{Total} & 20 & 0 & 0\% & \\
\text{Maddox} & 1 & 11 & 4 & 6.1\% & 32.15 \\
& 2 & 6 & 2 & 5.6\% & 27.27 \\
& 3 & 8 & 0 & 0\% & 35.45 \\
& \text{Total} & 25 & 6 & 4.0\% & \\
\text{Wyatt} & 1 & 7 & 0 & 0\% & 12.51 \\
& 2 & 6 & 0 & 0\% & 7.48 \\
& 3 & 6 & 0 & 0\% & 5.41 \\
& \text{Total} & 19 & 0 & 0\% & \\
\text{Overall Means} & & 24 & 4 & 3.02\% & 24.17 \\
\hline
\end{array}
\]

Table 3: Number of Sessions, and Percentage of Trials with Errors on Target Behaviors Through Criterion

![Figure 5](image.png)

Jackson

Figure 5. Percent of acquisition of instructive feedback by stimulus for Jackson.
Figure 6. Percent of acquisition of instructive feedback by stimulus for Madelyne.

Figure 7. Percent of acquisition of instructive feedback by stimulus for Maddox.
The Bill of Rights is the first 10... 

You must be 35 years old to run for... 
The most important right we have is... 
The governor of NC is Bev Perdue... 
Francisco Key is the Speaker of the... 
Nancy Pelosi is the Senate and the House of... 
Pass and Stow recast the liberty bell... 
The Senate and the House of... 
Thomas Paine wrote, "These are the... 
Pennsylvania has the power to declare war... 

Figure 8. Percent of acquisition of instructive feedback by stimulus for Wyatt.

TABLE 4

Percentage of Acquisition of Instructive Feedback Stimuli

<table>
<thead>
<tr>
<th>Student</th>
<th>Probe 1</th>
<th>Review</th>
<th>Probe 2</th>
<th>Probe 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson</td>
<td>16.7</td>
<td>16.7</td>
<td>53.9</td>
<td>68.0</td>
<td>46.4</td>
</tr>
<tr>
<td>Madelyne</td>
<td>80.0</td>
<td>–</td>
<td>57.0</td>
<td>58.0</td>
<td>64.7</td>
</tr>
<tr>
<td>Maddox</td>
<td>0.0</td>
<td>–</td>
<td>5.6</td>
<td>7.4</td>
<td>4.3</td>
</tr>
<tr>
<td>Wyatt</td>
<td>88.9</td>
<td>–</td>
<td>80.8</td>
<td>83.3</td>
<td>84.3</td>
</tr>
</tbody>
</table>

Further, the students received a different stimulus on each trial (intermittent presentation) and each piece of information was presented only once per day (minimal exposure). All four students acquired the targets to criterion level. Maddox had difficulty maintaining this level of responding to Set 2. Jackson needed a review session for Set 1 behaviors—but he was ill during probes and this may have contributed to a decreased level of correct responding. Second, three of these students acquired many instructive feedback responses despite the presentation of the stimuli following any, rather than a given, target behavior/response, reinforcing the concept from Werts et al. (2003) that it is not necessary to assign each instructive feedback stimulus to a given target.
stimulus. This finding further diminishes the notion that students acquire responses for instructive feedback stimuli because of a built relationship with target stimuli (Wolery et al., 1993) or that the building of a relationship between the stimuli is required for learning. It does not abuse the notion that the built relationship or the sequential proximity may be helpful.

Third, students acquired the instructive feedback responses despite having a different stimulus attached to each trial in the session resulting in two situations: exposing them to three times the number of instructive feedback behaviors than are usually taught, and presenting the instructive feedback stimuli intermittently and a minimal number of times. In several studies, there have been more than one stimuli added to a target (Anthony et al., 1996; Falkenstein, Collins, Schuster, & Kleinert, 2009; Gast, Doyle, Wolery, Ault, & Kolenda, 1994; Wolery et al., 1993). In these studies using discrete targets and instructive feedback stimuli, two stimuli per target were delivered. In the current study, six stimuli were delivered in concert with two target stimuli. In addition, the instructive feedback information used in this study was more complex than that used in other studies and as students acquired the behaviors, more were added to subsequent sets. Under the conditions of this study, it was possible to acquire all the presented behaviors. No student learned all of the information presented, but three of the four acquired more “pieces” of information than are generally acquired when the instructive feedback information is attached and limited to the number of target stimuli. Students may learn more as they are exposed to more stimuli in instructive feedback, but we cannot know when we reach the point of diminishing returns. Future studies should explore the relative efficiency of the addition of more stimuli.

Although some instructive feedback was delivered on each trial, it was different on each trial. Griffen, Schuster, and Morse (1998) found that there was little difference in efficiency of instruction when delivering instructive feedback on every fourth trial compared to delivery of the stimulus on every trial in which the target was presented. In this study, the gap was extended so that the stimulus was presented every 6th trial with only one presentation per day for each student. For three of the students, this results in more efficacious instruction (learning more in the allotted time).

The question of why inclusion of extra information with the praise statement of a trial is effective is still open. With this study, we present evidence that the relationship between the target and the stimulus does not appear to be necessary, but we do not yet know whether it is a salient factor. Other theories are still untested. Effectiveness of the procedure may be due to repetition, implied praise, behavioral momentum or observational learning (Werts et al., 2003). Clearly, more research is needed to determine the saliency of any of these factors.

**Limitations**

Results should be viewed cautiously due to several factors. Unanticipated interruptions during the course of this investigation may have influenced the rates of acquisition for some students—notably Jackson and Maddox. These disruptions included school holidays, but in addition, there were intermittent and extended cancellations of classes due to inclement weather. A total of 18 days were cancelled due to snow and many others were delayed so that class was shorter and, due to limited bus routes, some students did not come to school on those days. Although intermittent but systematic instruction has been shown to be effective in situations when it is systematic (Venn, Wolery, & Greco, 1996), lack of systematic instruction may have contributed to lower performance for some of these students. Although the number of sessions to criterion was similar with most of the students for most sets of target behaviors, the lack of consistent days of instruction contributed to students being in different conditions at different times. Many times one to two students were in probe conditions when others were receiving instruction. This created unequal opportunities to observe target or instructive feedback information presented to other students. The use of this configuration of direct instruction and instructive feedback should be examined for its utility in leading to
observation learning of peers target and instructive feedback stimuli.

In some studies, students have vocalized the material presented as instructive feedback even though it is not required or requested, and if it occurs, it is ignored. Three of these students did not repeat the information. Madelyne did sub-vocalize some of the sentences presented in some cases. It was not a consistent behavior for her. Because we cannot know whether there was a non-vocal response to the instructive feedback, it is unclear whether a language mediator was used—or would be instrumental in acquisition of behaviors. Future research could explore this as a possible enhancement of efficiency.

This study adds to the literature on instructive feedback in several important ways: (a) The addition of unrelated instructive feedback revolving among the target stimuli did not impede the acquisition of the target behaviors, (b) The addition of unrelated instructive feedback revolving among the target stimuli did not preclude the acquisition of the instructive feedback information, (c) More information was acquired when more was presented in the consequent event (the praise statement of the instructional trial). Based on these and other findings regarding instructive feedback, teachers may be encouraged to use the procedure to increase the efficiency of learning and the acquisition of behaviors.

References


Johnson, P., Schuster, J. W., & Bell, J. K. (1996). Comparison of simultaneous prompting with and without error correction in teaching science and vocabulary words to high school students with


Received: 30 June 2009
Initial Acceptance: 7 September 2009
Final Acceptance: 24 January 2010
Born in the early 1900s in rural Idaho, James Castle was believed to be deaf, mute, illiterate and intellectually disabled. Never speaking, he nevertheless produced tens of thousands of artworks using such found materials as ink made from soot and saliva, pens fashioned from twigs or sticks, and canvases scavenged from scrap paper. Today his behavioral and communication characteristics would likely be interpreted as consistent with autism.

This Idaho Public Television-aired video documentary uses Castle’s art (drawings, constructions, books) and exclusive interviews with Castle’s childhood friends, family and art experts to tell his unique story, helping the viewer to see the world as it might be experienced by a gifted artist with autism.

Member Price: $16.95
Non Member Price: $19.95

http://www.cec.sped.org/ScriptContent/Orders/ProductDetail.cfm?section=CEC_Store&pc=D5902

Package Price (book James Castle: His Life and Art and DVD Dream House)
Member Price: $35.95
Non Member Price: $39.95

http://www.cec.sped.org/ScriptContent/Orders/ProductDetail.cfm?section=CEC_Store&pc=D5903
When CEC’s Division on Developmental Disabilities published its landmark first edition of Best and Promising Practices in Developmental Disabilities in 1998, it quickly became a staple in the libraries of professionals working in the fields of cognitive disabilities/mental retardation, autism spectrum disorders, and associated developmental disabilities. Covering existing best practices in such arenas as assessment, curriculum development, and instructional strategies, that work quickly established itself as the premier publication of its kind.

Now this landmark publication is available in a greatly expanded second edition. Featuring contributions from some of the most notable names in developmental disabilities, the new Research-Based Practices in Developmental Disabilities — Second Edition provides current professional thought on such fundamental issues as the meaning of developmental disabilities, learning characteristics, assessment and instructional planning, and inclusive programs.

Present-day practitioners providing services to individuals with developmental disabilities are now required to implement best practices that are supported by research. This work answers the need of these practitioners for accessible and immediately practical information that reflects best practices as based in research.

The book is also designed to meet the needs of university personnel in special education teacher preparation programs. Each of the 29 chapters includes:

- Summary of chapter contents
- Learning outcomes
- Glossary of professional terminology
- Specific CEC Standards addressed in that chapter
- Web site resources

An accompanying Instructor’s Manual offers for each chapter a variety of useful supplements, including:

- Outline
- Extension Activities
- Exam questions and answers
Look! I'm in College! DVD

Look, I’m in College! is a half-hour documentary that follows four students through an extraordinary time in their lives. Terence, Benny, Rayquan, and Donald are New York City public school students from high-need communities. They all have autism and intellectual disabilities, and they are the charter class in a college-based inclusion program. Through collaborative efforts of the New York City District 75 and Pace University, these four young men from challenging socio-economic backgrounds met with success as they participated in a college community among their age-appropriate peers.

By the Division on Autism and Developmental Disabilities (DADD). 2008. 31 minutes.

Member Price: $34.95
Non-Member Price: $39.95

http://www.cec.sped.org/ScriptContent/orders/ProductDetail.cfm?pc=D5890
Education and Training in Autism and Developmental Disabilities

Editorial Policy

*Education and Training in Autism and Developmental Disabilities* focuses on the education and welfare of persons with autism and developmental disabilities. *ETADD* invites research and expository manuscripts and critical review of the literature. Major emphasis is on identification and assessment, educational programming, characteristics, training of instructional personnel, habilitation, prevention, community understanding and provisions, and legislation.

Each manuscript is evaluated anonymously by three reviewers. Criteria for acceptance include the following: relevance, reader interest, quality, applicability, contribution to the field, and economy and smoothness of expression. The review process requires two to four months.

Viewpoints expressed are those of the authors and do not necessarily conform to positions of the editors or of the officers of the Division.

Submission of Manuscripts

1. Manuscript submission is a representation that the manuscript is the author’s own work, has not been published, and is not currently under consideration for publication elsewhere.
2. Manuscripts must be prepared according to the recommendations in the *Publication Manual of the American Psychological Association* (Sixth Edition, 2009). Laser or high density dot printing are acceptable.
3. Each manuscript must have a cover sheet giving the names and affiliations of all authors and the address of the principal author.
4. Graphs and figures should be originals or sharp, high quality photographic prints suitable, if necessary, for a 50% reduction in size.
5. Five copies of the manuscript along with a transmittal letter should be sent to the Editor: Stanley H. Zucker, Mary Lou Fulton Teachers College, Box 871811, Arizona State University, Tempe, AZ 85287-1811.
6. Upon receipt, each manuscript will be screened by the editor. Appropriate manuscripts will then be sent to consulting editors. Principal authors will receive notification of receipt of manuscript.
7. The Editor reserves the right to make minor editorial changes which do not materially affect the meaning of the text.
8. Manuscripts are the property of *ETADD* for a minimum period of six months. All articles accepted for publication are copyrighted in the name of the Division on Autism and Developmental Disabilities.
Search the entire archives of

*Education and Training in Autism and Developmental Disabilities*

at

http://daddcec.org/Publications/ETADDJournal.aspx

Visit the official Website of the
Division on Autism and Developmental Disabilities:

http://www.daddcec.org