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# Increasing Effective Self-Advocacy Skills in Elementary Age Children with Physical Disabilities

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## ACCEPTANCE

This dissertation, INCREASING EFFECTIVE SELF-ADVOCACY SKILLS IN ELEMENTARY AGE CHILDREN WITH PHYSICAL DISABILITIES, by MARY JANE THOMPSON AVANT, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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## Abstract

### INCREASING EFFECTIVE SELF-ADVOCACY SKILLS IN ELEMENTARY AGE CHILDREN WITH PHYSICAL DISABILITIES

by  
Mary Jane Thompson Avant

For students with physical and health disabilities, the development of self-advocacy skills is critical to their future success. Characteristics that may inhibit the development of self-advocacy skills in this population include reliance on others for assistance across multiple areas requiring physical abilities, deficits in communication skills, and the development of learned helplessness. Instruction in self-advocacy is needed for this population of students in order to maximize future success and decrease learned helplessness (Angell, Stoner, and Fulk, 2010; Macdonald & Block, 2005; Roberts, 2007). For this study, the researcher provided instruction to four elementary age students with physical disabilities who exhibited characteristics of learned helplessness, including ineffective initiation of requests. Students used speech, sign, or gestures as their primary form of communication, and were able to use this form of communication as a reliable means of response during typical classroom activities, including social interactions and when responding to questions. When they needed to initiate a request for required materials during classroom activities, they made no response, ineffectively gestured, or made unrelated comments when prompted to complete an activity. Students who initiated requests  $\leq 50\%$  of presented opportunities were eligible to participate in this study.

The intervention consisted of combined use of environmental arrangement and the system of least prompts in a multiprobe multiple baseline across participants design. Environmental arrangement strategies included missing materials or materials that were out of reach. The system of least prompts involved the following levels of prompting: (a) independent, (b) verbal – restatement of direction, (c) indirect verbal, and (d) verbal/model. Analysis of the data indicated that three of the four students increased their effective initiation of requests during intervention, and generalized this skill to new materials and novel settings. The fourth student exhibited noncompliant behaviors that interfered with his ability to reach criteria during intervention. These results support the effectiveness of this intervention in decreasing learned helplessness and increasing the self-advocacy skill of initiating requests with students with physical disabilities who have no interfering behaviors.



INCREASING EFFECTIVE SELF-ADVOCACY SKILLS  
IN ELEMENTARY AGE CHILDREN WITH  
PHYSICAL DISABILITIES

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Mary Jane Thompson Avant

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in  
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TABLE OF CONTENTS

	Page
List of Tables .....	iv
List of Figures .....	v
Abbreviations .....	vi
Chapter	
1	SELF-ADVOCACY SKILLS IN CHILDREN WITH PHYSICAL DISABILITIES: A REVIEW OF THE LITERATURE.....1
	Introduction.....1
	Review .....2
	Conclusion .....24
	References.....25
2	INCREASING EFFECTIVE SELF-ADVOCACY SKILLS IN ELEMENTARY AGE CHILDREN WITH PHYSICAL DISABILITIES .....32
	Statement of the Problem.....32
	Purpose.....44
	Research Questions.....44
	Methodology .....45
	Results.....62
	Discussion.....71
	Future Considerations .....81
	References.....84
Appendixes .....	93

## LIST OF TABLES

Table		Page
1	Student Demographics .....	47
2	Materials Sets.....	52
3	Ana’s Response Types.....	65
4	Bill’s Response Types.....	66
5	Carlos’s Response Types .....	68
6	Dan’s Response Types.....	69
7	Student Responses to Self-Advocacy Checklist .....	70

## LIST OF FIGURES

Figure		Page
1	Elements of Self-Determination .....	35
2	Percentage of independent initiation of requests by participants across all phases (baseline, intervention, generalization, and probes .....	64

## ABBREVIATIONS

AAC	Augmentative and Alternative Communication
ADA	Americans with Disabilities Act
ADHD	Attention Deficit Hyperactivity Disorder
IDEA	Individuals with Disabilities Education Act
IEP	Individualized Education Program
IOA	Interobserver Agreement
LD	Learning Disabilities
MITS	Modified Incidental Teaching Sessions
NCLB	No Child Left Behind Act
OI	Orthopedic Impairments
PMT	Prelinguistic Milieu Teaching
RMR	Reliable Means of Response
TBI	Traumatic Brain Injury
VOCA	Voice Output Communication Aid

CHAPTER 1  
SELF-ADVOCACY SKILLS IN ELEMENTARY AGE CHILDREN WITH PHYSICAL  
DISABILITIES: A REVIEW OF THE LITERATURE

**Introduction**

Students with physical disabilities are faced with myriad challenges in the educational setting. The interaction of the type of disability, its effects, and various social and environmental factors will have broad implications for functioning, both in the physical setting and in terms of learning. Deficits in motor skills that are required for typical learning outcomes and products (e.g., fine motor skills related to coloring, cutting, and writing, gross motor skills related to travel throughout the school environment, oral motor skills related to communication and eating) will result in difficulty in student performance. As the level of physical disability increases, the number of interventions required for access to activities and materials may increase. Interventions may include adaptations for positioning, assistive technology to address lack of motor skills required for typical classroom activities (e.g., class discussions, written production), and peer or adult assistance for activities of daily living (e.g., toileting, eating, travel from one area to another).

The need for multiple interventions and assistance may foster dependence on others and restrict the development of independent skills for students with significant physical disabilities. Parents may inadvertently contribute to this dependence on others by performing tasks for their children beyond the age when children typically begin expressing a desire to do things themselves. For typically developing children, parent roles as caregivers gradually recede as children strive for independence across a



multitude of activities (e.g., self-dressing, play). Children with physical disabilities often lack the ability to express their own desires due to significant communication disorders, and may not have the capability to physically perform many tasks. Over time, this dependence on parents and others may foster the development of passive behavior (Fiedler & Danneker, 2007) and learned helplessness (Best, 2009; Heller, 2009). Unless specific instruction is provided to assist students in developing self-determination skills, learned helplessness will be fostered (Angell, Stoner, & Fulk, 2010; Heller, Allgood, Ware, Arnold, & Castelle, 1996).

The purpose of this literature review is to explore the concepts of learned helplessness, self-determination, self-advocacy, and environmental arrangement as they relate to individuals with physical disabilities. Studies to promote the development of self-advocacy and decrease learned helplessness behaviors will be examined.

## **Review of the Literature**

### **Learned Helplessness**

**Theory.** Learned helplessness can be a predominant characteristic in those with physical disabilities. Learned helplessness has been defined as the belief that an outcome is independent of any response from an individual (Maier & Seligman, 1976). An individual's belief in this lack of control reduces motivation, and may interfere with the ability to recognize that their actions can control an outcome. Learned helplessness may result in negative consequences related to motivation, cognition, and emotions.

Decreased motivation results when an individual accepts previous failed attempts at a task as the norm, or expectation, and develops a passive style of interaction and learning (cognition). A learned behavior of passivity prevents the individual from actively

attempting activities that have been unsuccessful in the past, as well as activities with similar characteristics that are viewed as equally unattainable. Over time, emotions such as anger, frustration, and anxiety can be exhibited when an individual is confronted with a task or activity that is viewed as unattainable.

Abramson, Seligman, and Teasdale (1978) expanded on the theory of learned helplessness. Additional concepts included the delineation between personal responsibility versus universal responsibility, general versus specific situations, and chronic versus acute abilities. These concepts can be equated with particular styles of behavior and learning that may follow an individual throughout their life (Martinez & Sewell, 2000).

**Learned helplessness and physical disabilities.** For students with physical disabilities, this belief develops as parents, teachers, and others do tasks for them that they are capable of doing for themselves. Over time, the student loses any motivation to initiate or attempt a task on their own, as they have come to believe that they are not able to do tasks for themselves, and that this inability will not change (Abramson et al., 1978; Best, 2009; Heller, 2009; Heller & Gargiulo, 2009). Students may possess the necessary skills to complete a task, but will expect others to do that task for them, based on their prior experiences with adults and peers performing tasks for them (Roberts, 2007). Martinez and Sewell (2000) studied the styles of college students with and without physical disabilities. They found that students with a pessimistic explanatory style (belief that outcomes would occur regardless of personal responses, would always occur in this manner, and would occur across multiple settings and activities) correlated with a lower GPA. Interestingly, this result was the same whether or not the student had a physical

disability. The authors did suggest that students with physical disabilities may have developed a pessimistic explanatory style as a result of learned helplessness.

Learned helplessness is much more than a bad habit, or laziness on the part of the individual with physical disabilities. It is a belief that alters cognition, and requires specific instruction to overcome. Indeed, a lack of instruction can actually foster or reinforce learned helplessness (Angell et al., 2010; Heller et al., 1996). Students with physical disabilities are in need of instruction in self-determination skills at an early elementary age, including the skill elements of self-advocacy. Angell et al. (2010) provided an in-depth review of recommendations from 17 adults with physical disabilities on the development of skills in self-determination, including the ability to advocate for oneself. A number of topics were covered in the interviews, and the themes that emerged from the interviews included the impact of attitudinal barriers on success, the importance of support from a variety of groups (e.g., family, friends, community agencies), the need to develop skills in areas such as goal setting and self-awareness, and suggestions for strategies to be used when developing instructional interventions for this population. It is important then, for instruction to begin during the early years of education in order to combat the development of learned helplessness, and promote self-determined behaviors, including the ability to be an advocate for oneself.

### **Self-Determination**

**Definition.** Self-determination has been defined as acting as the primary causal agent in one's life, and includes the ability to make choices and decisions that are goal-directed and without undue influence from others, based on knowledge of one's strengths

and needs (Field & Hoffman, 2002; Karvonen, Test, Wood, Browder, & Algozzine, 2004; Wehmeyer & Palmer, 2002). Wehmeyer (1999) developed a functional model of self-determination which focused on causal agency and its relation to quality of life for an individual. Wehmeyer's model proposes a relation between an individual's capacity for action and that individual's environment. Supports that will encourage the development of skills such as choice-making and behavior that is independent and based on an individual's knowledge of his own strengths and needs is a key piece of that model. Wehmeyer's theory led to the identification of component elements of self-determined behavior which can form the basis for instruction (Karvonen et al., 2004; Wehmeyer, 1999).

**Component elements.** The component elements of self-determination include the skills of choice making, decision making, problem-solving, goal setting and attainment, self-advocacy, self-efficacy, self-knowledge and understanding, self-observation, evaluation and reinforcement, independence, risk-taking, and safety, self-instruction, and internal locus of control.

**Educational focus.** Recent emphasis has been placed on the development of self-determination skills as an educational objective, as evidenced by language in the reauthorization of IDEA that mandates self-determination practices when discussing transition services for students during IEP meetings (Field & Hoffman, 2002). The provision of instruction that teaches self-determination skills is now recognized as an important component when developing programs for students with disabilities (Field & Hoffman, 2002; Karvonen et al., 2004; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). Instruction in self-determination skills should span all grade levels (Erwin &

Brown, 2003; Kleinert, Harrison, Fisher, & Kleinert, 2010; Palmer & Wehmeyer, 2003; Wehmeyer, 1999; Wehmeyer & Palmer, 2002). Some skills are more applicable to students in secondary education, while others are more appropriate to instruction during elementary school.

Traditionally, students with learning disabilities and intellectual disabilities have been the target populations for instruction in self-determination skills – specifically targeting the self-advocacy component element of self-determination (Angell et al., 2010; Clark, Bigge, & Best, 2010; Fiedler & Danneker, 2007; Field & Hoffman, 2002; Karvonen et al., 2004; Test, Fowler, Wood, Brewer, & Eddy, 2005; Van-Belle, Marks, Martin, & Chun, 2006). Student participation in IEP meetings, and the development of self-determination skills that will promote a successful transition to post-school adult roles and responsibilities in the community have been the focus of instruction (Clark et al., 2010; Fiedler & Danneker, 2007; Test et al., 2005). Other populations of students with disabilities, including those with physical disabilities, are in need of instruction. This need has been voiced by educators as well as adults with physical disabilities (Angell et al., 2010; MacDonald & Block, 2005; Roberts, 2007).

**Educational focus and students with physical disabilities.** Self-determination, especially those component elements that require communication skills in order to be implemented (e.g., self-advocacy) is more of a challenge for individuals with physical disabilities. Often, these individuals possess limited communication abilities, and their motor disability places restrictions on performance of physical tasks (Clark et al., 2010). Erwin & Brown (2003) concur, stating that motor deficits can negatively impact a young child's ability to promote self-determined behavior. In addition, learned helplessness can

be a predominant characteristic in those with significant physical disabilities. These limitations may negatively impact the development of skills related to self-determined behavior. For those with limited motor capabilities, the priority becomes the development of communication skills (Erwin & Brown, 2003; Ronski, personal communication, February 18, 2011) as a means of attaining self-determined skills and abilities. Effective communication skills can allow the individual with physical disabilities to direct their needs, assuming responsibility for themselves, and directing their goal-setting and attainment independent of others' influence or interference. Communication skills align directly with one of the elements identified as key to the development of self-determined behavior: the element of self-advocacy.

### **Self-Determination Component: Self-Advocacy**

**Definition.** There is no consensus definition of self-advocacy. Definitions range from those that pertain to civil rights issues, to education, to those for individuals with disabilities. Most definitions include an ability to speak for oneself, to communicate one's strengths and needs, and the ability to be assertive when advocating for one's needs (Test et al., 2005). Test et al. (2005) have developed a conceptual framework for self-advocacy for students with disabilities, which includes knowledge of self, knowledge of rights, communication, and leadership. Within each component of the model, there are subcomponents which can be targeted for instruction.

**Knowledge of self.** Subcomponents of knowledge of self include the ability to recognize one's strengths and needs, to develop goals, and to be able to inform others about one's disability and needed accommodations. If a student is to be able to advocate for themselves, self-knowledge is critical. In fact, knowledge of self is viewed as a

foundational component of Test's conceptual framework of self-advocacy. Wehmeyer and Schalock (2001) emphasize the importance of self-knowledge, particularly a realistic understanding one's own strengths and limitations, before one can self-advocate clearly and effectively. Accurate self-knowledge will allow the student to act successfully when advocating for himself (Wehmeyer, 1999). Knowledge of one's skills, abilities, and limitations is essential, and instruction can be provided to develop and enhance this knowledge. Students with intellectual disabilities have been taught skills that include self-knowledge using classroom sessions that involved role-playing, small group work, and large group activities (Abery, Rudrud, Arndt, Schauben, & Eggebeen, 1995). Models of instruction have been developed for use with students with learning disabilities as well. Instruction for high school aged students with learning disabilities has proven effective in developing students' awareness and understanding of learning disabilities in general, as well as the impact of their own specific learning disability on their success, both academically and socially (Durlak, Rose, & Bursuck, 1994). The students were taught how to advocate for specific accommodations that would address identified limitations. Results documented an increase in skills for all participants in the study. Roffman, Herzog, and Wershba-Gershon (1994) evaluated the effectiveness of a college course designed to promote student knowledge about learning disabilities, especially related to their own strengths and limitations, and the ability to advocate for needed accommodations independently. Data analysis was found to support the premise that the course had the desired effect of increasing student self-advocacy skills. Without the ability to accurately identify one's own strengths and needs, the identification of unrealistic personal goals and objectives can be the result (Trainor, 2007).

Knowledge of self for students with physical disabilities may be confounded due to feedback that leads to inaccurate assumptions. Parents, teachers, and peers may inadvertently promote a false concept of ability by attempting to bolster a student's self-confidence through inflated praise (Clark et al., 2010). For many students with physical disabilities, a lack of exposure to typical peers, and an over-reliance on others, can lead to inaccurate self-knowledge, which may lead to the development of inappropriate goals. In addition, knowledge of self may necessitate the ability to recognize and respond to situations which could result in a significant medical emergency if ignored (e.g., a student with diabetes does not recognize a drop in sugar and request a snack, a student with a spinal cord injury who does not remember to shift his weight periodically to avoid the development of a pressure ulcer) (Heller & Gargiulo, 2009). It is evident that knowledge of self is of primary importance in the development of self-advocacy skills for a diverse population of students with disabilities.

**Knowledge of rights.** Subcomponents of knowledge of rights include items often associated with civil rights, such as knowledge of personal rights, human rights, and educational rights. Students with a variety of disabilities have protections under a number of federal and state laws, including IDEA, ADA, and Section 504 of the Rehabilitation Act. Students with disabilities often rely on others to advocate for them, particularly in the school setting. Instruction in rights and responsibilities is important in order for students with disabilities to be able to advocate for themselves, particularly as they transition into adult roles.

Several studies have evaluated interventions designed to develop self-advocacy skills in the area of knowledge of rights. Phillips (1990) evaluated the effectiveness of a



seminar for students with learning disabilities in the development of self-advocacy skills. Included in the seminar was the provision of information regarding legislation regarding learning disabilities and resource available to them through the Division of Rehabilitation Services. Results as reported by Phillips indicated a positive outcome for those students who participated in the program. Brinckerhoff (1994) reported on a transition seminar offered to college-bound students with learning disabilities. Components of the seminar included information on legislation including IDEA, Section 504, and the ADA. Positive feedback was received from both faculty and students following completion of the program. Abery et al. (1995) included instruction in student rights as a part of a multicomponent program to develop self-determination skills in students with intellectual disabilities. Abery et al. (1995) reported that the intervention seemed to have been instrumental in the development of the selected skills, including self-advocacy.

For students with physical and health disabilities, including visual impairments and blindness, and those with severe physical needs, instruction in knowledge of rights has proven effective as well. Rumrill (1999) evaluated the effectiveness of an intervention to promote social competency, including knowledge of rights under the ADA's Title I provisions, for adults with visual impairments and blindness. He reported a statistically significant effect on self-advocacy skills, including knowledge of rights, for the participants in the study. In a study conducted by Powers, Sowers, and Stevens (1995), adolescents with severe physical disabilities were paired with mentors with similar disabilities. The impact of mentoring on the self-advocacy skills of the adolescents, including the development of knowledge of rights as they related to access to community resources, was evaluated. There appeared to be positive effects of the

mentoring program on the adolescents' self-advocacy abilities. Evidence suggests that instruction in rights for individual with disabilities is a vital component in the development of self-advocacy skills.

**Leadership.** The subcomponent of leadership involves skills required to move beyond advocating for oneself to a broader range of advocacy including advocating for others, or for political causes. Leadership can be associated with the development of an IEP, where the student directs the meeting, proposes goals and objectives, and requests accommodations (Fiedler & Danneker, 2007; Field & Hoffman, 2002). An individual can be an effective self-advocate without stepping into a leadership role (Test et al., 2005).

**Communication.** Subcomponents of communication include the ability to be assertive when advocating for oneself, and the ability to negotiate and compromise when working to achieve a goal. Communication skills are supported by the individual's knowledge of self and knowledge of rights (Test et al., 2005). The student must have an accurate perception of his abilities and needs before he can advocate for needed accommodations or assistance. Once he has the knowledge, it is imperative that he be able to communicate those requirements effectively. According to Kleinert et al.(2010), the ability to communicate is an essential element for a majority of the components of self-determination, including the self-advocacy component. For students with learning disabilities, this skill can be reflected in their ability to recognize academic needs and request appropriate accommodations (Izzo & Lamb, 2003). Communication can be verbal, non-verbal, even written, depending on the abilities of the students (Abery et al., 1995; White & Thompson, 1997).

For students with severe physical disabilities that may affect their ability to communicate, this becomes a critical area for instruction. Often, these individuals possess limited communication abilities, and their motor disability places restrictions on performance of physical tasks (Clark et al., 2010). Erwin & Brown (2003) concur, stating that motor deficits can negatively impact a young child's ability to promote self-determined behavior. For students with severely impaired communication skills, the use of an Augmentative and Alternative Communication system (AAC) is an essential accommodation. For students with severe physical disabilities, the ability to communicate provides an avenue them to direct needed assistance (e.g., ask a peer to help them hold the paper while they color or glue, direct an adult in the steps for tube feeding) (Best, 2009). Students can also direct accommodations that will allow them to participate more fully in the classroom (e.g., ask to be moved to a position that allows them to view a presentation by a teacher or peers) (Heller & Gargiulo, 2009). Effective communication abilities are key to the development of self-advocacy skills for students with severe physical and communication disabilities.

### **Self-Advocacy Intervention Studies Targeting Communication**

**Requesting accommodations.** Many students with disabilities rely on their parents and teachers for support during their early school years, and do not develop the self-advocacy skills that will be essential as they transition from high school to post-secondary educational settings (McCarthy, 2007). Legislative mandates that ensure accommodations during elementary, middle, and high school do not extend into college, thus requiring that college students develop the needed skills in order to recognize their own strengths and needs, and advocate for themselves in order for their needs to be met.

Durlak et al. (1994) evaluated the effect of direct instruction on self-determination behaviors of eight high school students with learning disabilities. The study used a multiple-baseline-across behaviors design to determine the effectiveness of the intervention on a set of seven self-awareness and self advocacy skills. These skills were identified as being critical for success in a post-secondary setting. Included on the list were communication skills related to requesting accommodations specific to individual learner needs. A combination of direct instruction in targeted skills, role-play and rehearsal of strategies, videotaping of sessions to be used for corrective feedback, and practice sessions conducted until mastery was demonstrated. Results were positive for all eight participants. All students were able to respond correctly on a majority of the steps identified for each skill. However, two of the students were unable to demonstrate generalization of the skills when asked to request accommodations from their teachers. The researchers determined that more intensive practice is needed in order for students to be successful when advocating for themselves.

In a study conducted by Roessler, Brown, and Rumrill (1998), three college students with disabilities (visual impairment, rheumatoid arthritis, learning disability) were taught how to advocate for accommodations with their professors. A single subject, multiple baseline design was used to evaluate the acquisition and maintenance of a total of 17 targeted behaviors related to the ability to communicate about their disability and the need for specific classroom accommodations. Intervention included instruction presented in a lecture format, role playing following videotaped modeling of targeted skills, and repeated practice and feedback of the skills. Results indicated that the training

was successful, with all three participants demonstrating acquisition, maintenance, and generalization of the identified skills.

It is not only in the school setting that accommodations are required. Accommodations are needed in the workplace as well. Individuals with disabilities should be able to recognize the accommodations that will enable them to handle vocational expectations, and be able to request those accommodations of their employers. Rumrill (1999) evaluated the effectiveness of a social competence training program on the ability of individuals who were blind or visually impaired to identify and request needed accommodations on the jobsite. The design of the study involved a two-group (experimental and control), posttest only method to evaluate the effectiveness of the intervention. The intervention was three-tiered, involving instruction, role playing, practice sessions and corrective feedback, and monitoring of participants' use of strategies on the job. Analysis of the data collected during the study indicated that all participants in the experimental group were able to identify and request needed accommodations from their employers, resulting in increased work productivity and success.

Brinckerhoff (1994) reported on the need for the development of self-advocacy skills in college students with learning disabilities (LD). While not a study, this article provided detailed information on topics that the author considered key components of a program designed to foster self-advocacy skills for college students with LD. Many of the components in the program align with the components identified in the framework on self-advocacy as developed by Test et al. (2005). Included components were sessions devoted to instruction in (a) learning disabilities and the specific impact of the disability

on the students in the program (knowledge of self), (b) knowledge of legal rights, including rights under various federal mandates such as Sec. 504 and the Americans with Disabilities Act (knowledge of rights), and (c) requesting accommodations in the classroom, including skills needed to express these requirements effectively to their professors (communication).

In terms of students with physical disabilities, very few studies have been conducted in the area of self-advocacy instruction. MacDonald and Block (2005) provided information on the development of self-advocacy skills in a young student with cerebral palsy related to her participation in physical education class. These authors did not conduct a study, and no formal method of instruction was identified. The authors reported on staff and peer support needs as key to the success of this young student in developing self-advocacy skills that extended beyond her participation in the IEP meeting. Further, the authors provided suggestions designed to promote the development of self-advocacy skills for students with physical disabilities; many of their suggestions aligned with the components defined in the framework for self-advocacy developed by Test et al. (2005), including instruction in the student's specific disability (knowledge of self) and development of skills required when advocating for needed accommodations (communication).

Roberts (2007) conducted a qualitative study on the impact of a mentor-mentee relationship on the development of self-determination skills, including self-advocacy skills, for a 5<sup>th</sup> grade student with spina bifida. A qualitative design was used, which included observations and interviews conducted with both participants during the course of the study. The 5<sup>th</sup> grade student was paired with a high school student with a similar

disability and level of physical functioning ability. The goals for the mentoring included increasing the level of independent function for the 5<sup>th</sup> grader, and improving his social interactions. It was reported that the younger student displayed characteristics of learned helplessness, as he often asked others to perform tasks that he was capable of performing for himself, or denied the ability to perform the tasks. A combination of casual conversations and role-modeling was used in a variety of settings across a number of activities as the intervention. Results as reported indicated an increase in independent skills and improved social interaction for the student.

Individuals with disabilities must be able to recognize their needs and communicate those needs effectively in a variety of settings, both educational and vocational. Data from studies using a package that includes direct instruction, role playing, and opportunities for practice with feedback to increase requesting of accommodations by individuals with a variety of disabilities support the effectiveness of these types of interventions. Often, the focus for younger individuals is predominantly in the educational sphere, and targets student participation in IEP meetings as a means of developing self-advocacy skills that involve the ability to clearly communicate strengths and needs.

**IEP participation.** Given the mandate from IDEA that students must be involved in transition planning beginning at age 14, it is not surprising that student participation in IEP meetings has become an important avenue for developing self-advocacy skills.

Arndt, Konrad, and Test (2006) evaluated the effectiveness of a curriculum entitled *Self-Directed IEP*. Five high school students with a variety of disabilities (e.g., mild intellectual disability, autism, nonverbal learning disability, mild cerebral palsy with

hydrocephalus, emotion and behavior disorder) participated in the study. The intervention package included direct instruction, video modeling, and guided practice sessions with feedback. Students were observed attending IEP meetings both prior to and following intervention. A multiple baseline across behaviors design was used, allowing data to be collected and analyzed across the three units of instruction, comprised of a total of ten lessons. The lessons were designed to build on the set of skills typically required in an IEP meeting (e.g., how to begin a meeting, points to cover including review of past performance and setting of goals and objectives, closing the meeting). All students increased their participation in practice IEP meetings, and were able to generalize the skills to actual IEP meetings following the intervention.

Martin et al. (2006) also evaluated the effectiveness of the *Self-Directed IEP* on the development of skills required for use in IEP meetings. In contrast to the single-subject design used by Arndt et al. (2006), the study by Martin et al. (2006) used a pretest/posttest design, with students randomly assigned to the control or intervention group. A total of 130 students with disabilities including intellectual disability, learning disability, orthopedic impairment, autism, and emotion and behavior disorders participated in the study. Additional participants included hundreds of IEP team members such as parents, teachers (general and special education), support staff, and family and friends of the student. The curriculum was implemented according to the lesson plans provided with the curriculum. Following the intervention, students were observed to be more actively engaged in the IEP process. Students were more likely to start the meeting, contributed more during the meetings, and demonstrated increased leadership skills.



Another curriculum designed to increase student participation in IEP meetings, entitled *The Self-Advocacy Strategy* (Van Reusen, Bos, Schumaker, & Deshler, 1994) provides instruction in five steps designed to develop competency in the following areas: the ability to identify strengths and needs, as well as accommodations to address needs; the ability to communicate this information to others; the ability to listen attentively and respond; to ask questions, and to communicate goals effectively. In a study by Hammer (2004), instruction in *The Self-Advocacy Strategy* was provided using technology (CD-ROM training sessions) followed by opportunities for role play with teachers and other professionals, as well as peers. Three students with disabilities (one student with learning disabilities, one student with Tourette syndrome, obsessive-compulsive disorder, attention-deficit disorder, and pervasive developmental delay, and one student with learning disabilities and selective mutism) participated in the study. A multiple baseline across participants design was used for the study. Following implementation of the intervention, all three participants demonstrated an increase in their participation in IEP meetings. The students were able to verbalize their strengths and needs, and were able to assist in the development of appropriate goals to address their identified needs.

Test and Neale (2004) also evaluated the effectiveness of *The Self-Advocacy Strategy* for increasing student participation in IEP meetings. Four students identified as having high incidence disabilities (e.g., mild intellectual disability, learning disability, emotion and behavior disorders) were instructed in the steps of *The Self-Advocacy Strategy*. Using a single subject, multiple probe across participants design, direct instruction was provided for each participant in a one-on-one setting. Following

intervention, all students demonstrated an increase in their quality of participation in their IEP meetings.

Individuals with disabilities are able to develop the skills required to be self-advocates, and can actively participate in identifying their own strengths, needs, goals, and accommodations, in school and beyond. At a more basic level, however, is the need to communicate more immediate needs. Students with disabilities may exhibit passive styles of interaction, relying on others to act for them. Learned helplessness is the result of repeated experiences in which the individual is not required to act in order to receive assistance, accommodations, or support. Interventions which can address this passive demeanor, replacing it with the ability to advocate for needs, are critical to the development of self-advocacy skills.

**Initiating requests.** Several studies targeting initiation of requests that included individuals with physical and health disabilities have been conducted. In a study conducted by Balcazar, Fawcett, and Seekins (1991), four college students with physical and health disabilities (e.g., hearing loss, spinal cord injury, visual impairment, traumatic brain injury) were instructed in strategies to use when requesting assistance as they worked toward the achievement of personal goals (e.g. accessibility issues, skills to acquire information about opportunities and instruction on campus, how to obtain advice). A manual was developed that contained instruction on a variety of topics related to requesting assistance. This manual was coupled with role-playing activities as the intervention package. A simple interrupted time series design was used, with multiple replications across participants over a four week time span. Results indicated that all

participants were able to increase and generalize help-recruiting behaviors following completion of the training sessions.

A second study conducted by Powers et al. (1995) also involved individuals with physical disabilities. In this study, the participants were ten adolescents with severe physical disabilities (e.g., cerebral palsy, spina bifida, muscular dystrophy, juvenile rheumatoid arthritis) who were instructed in self-efficacy skills and knowledge of rights in the community. Additional information was collected regarding parent perceptions of the success of the intervention on their children's skills. A mentor-mentee intervention package was designed that incorporated a variety of activities aimed at increasing skills required to be successful in the community, including the ability to recruit help as needed to attain goals. Topics covered included issues related to housing, travel, recreation, and employment in the community. One-on-one meetings were predominant, with several meetings that involved all of the participants also included in the package. A two-independent group randomized block design was used in this study. Results indicated that mentoring appeared to be a positive intervention for use when developing self-efficacy and knowledge skills for individuals with physical disabilities.

A third study by Taylor-Ritzler et al. (2001) targeted transition skills with 41 high school students with disabilities (mild intellectual disabilities, learning disabilities, and physical disabilities). The intervention package used for this study was composed of a curriculum component and a case management component. The curriculum included instruction on how to set and obtain personal transition goals through recruitment of needed assistance. The case management component included support from case managers with transition-related matters. A combination of direct instruction in the skills

needed to identify goals and obtain help and various role-playing activities was used during this study. Statistical analysis of results including t-tests and ANOVA examined target behaviors exhibited prior to and following intervention. Results indicated that a majority of the students were able to set and achieve goals related to transition following the intervention.

It is apparent that the ability to initiate requests, including recruiting assistance as needed to obtain goals, is closely tied to the ability to communicate effectively. For students with physical disabilities, communication is often a challenge, as many of these individuals have impaired communication skills as a part of their disability. Instruction in self-advocacy is critical for students with physical disabilities and requires specialized instructional strategies to accommodate for their physical and communication challenges. Interventions that incorporate strategies to increase communication skills while developing self-advocacy skills are needed for this population. One such strategy which can be readily modified is the use of environmental arrangement to promote effective communication, and thus, self-advocacy.

### **Environmental Arrangement**

**Definition.** One of the strategies that has shown promise in developing the skill of communication is the use of environmental arrangement (Heller et al., 1996; Kaiser & Grim, 2006; McCathren, 2000; Olive et al., 2007). Kaiser and Grim (2006) described a method for teaching functional communication skills utilizing naturalistic strategies in conjunction with behavioral teaching strategies. One of the behavioral strategies identified is environmental arrangement. Environmental arrangement involves strategies to promote communication. Kaiser and Grim (2006) delineated six strategies that could

be used to encourage communication, including the use of interesting materials, placing materials out of reach, providing inadequate portions, providing opportunities for choice making, arranging activities that will require assistance, and creating unexpected situations. When situations are created in which the student does not have the materials required for completion of a task, the student can be taught to communicate their need (e.g. the student needs a pencil in order to complete a written task, needs help getting his book out of his backpack).

**Studies using environmental arrangement.** Several studies using environmental arrangement have been conducted. Heller et al. (1996) used environmental arrangement to teach four high-school students with cognitive and visual impairments to initiate requests using a combination of sign language (primary means of communication) and dual communication boards. Initiation of requests was promoted using environmental arrangement to create situations in which the student would have to request assistance in school-based settings, with generalization to work-place settings. Initiation of requests included the need for items to complete a task (e.g., items were missing or in insufficient number), or the need for assistance to actually finish the task at hand. The study used a multiple-baseline probe design, and included baseline, intervention, and generalization phases. Following intervention, all students were able to initiate requests with 80%-100% accuracy.

McCathren (2000) used environmental arrangement as part of a prelinguistic intervention in order to increase communication skills in a student with severe communication and cognitive delays. The student was pre-school aged, and was nonverbal, rarely initiated communication, and had limited play skills. The teacher was

instructed in the use of prelinguistic milieu teaching (PMT) strategies to be used as the intervention for this study. PMT strategies include the use of environmental arrangement. In this study, toys that were identified as high-interest for the student were used to encourage initiation of requests. The toys were placed in view but out of reach, and modeling and imitation were used as strategies to promote initiation of requests for the desired toy. This study used a multiple baseline across behaviors design. Results indicated an increase in the use of intentional communication by the student, including spontaneous use of signs and words.

Olive et al. (2007) used environmental arrangement to promote requesting for three children with autism who used a voice output communication aid (VOCA). The study used a multiple probe design across participants, with intervention occurring during 5-minute play sessions in the child's familiar classroom environment. High-interest toys were placed in sight but out of reach, and a combination of imitation and modeling strategies was used to promote initiation of requests. Using a system of most-to-least prompts, the students were instructed in the use of their VOCA to make requests. All three children increased their independent use of their VOCA to make requests during play activities.

Previous studies involving individuals with physical disabilities in high school and college have used direct instruction and role-play as interventions to promote self-advocacy skills, including communication skills such as requesting accommodations for classroom support, or requesting assistance in community settings. Studies using environmental arrangement have targeted communication skills as well, although none have included students with physical disabilities. Studies using environmental

arrangement as an intervention provide evidence for the feasibility of the use of environmental arrangement as a strategy to promote communication skills for individuals with a variety of disabilities. An evaluation of the use of environmental arrangement as a strategy to promote effective communication skills in young students with physical disabilities would be an important contribution to the study of instruction in self-advocacy for this population.

### **Conclusion**

The development of self-determination skills is a critical component of education for students with disabilities. Self-advocacy is one of the components of self-determination that has received attention in the educational setting. One of the elements of self-advocacy is communication. This element has been addressed primarily through research targeting participation in IEP meetings and the ability to advocate for accommodations. Numerous studies have provided intervention for students with intellectual disabilities or specific learning disabilities. The majority of these students were in high school or college settings. Only a few studies have targeted the development of self-advocacy skills for students with physical disabilities, and the focus has remained in the high school or college setting. There is a need for further research in the area of self-advocacy, particularly the skill of effective communication, for younger students with physical disabilities.

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CHAPTER 2  
INCREASING EFFECTIVE SELF-ADVOCACY SKILLS IN ELEMENTARY AGE  
CHILDREN WITH PHYSICAL DISABILITIES

**Statement of the Problem**

Educational programs for individuals with disabilities have focused most often on academics, to the exclusion of other skills. Mandates that require all students with disabilities to participate in standardized testing, and the requirements delineated in No Child Left Behind concerning adequate yearly progress, have become the driving force behind the development of goals and objectives for students with disabilities (Angell et al., 2010). However, recent emphasis has been placed on the development of self-determination skills, as evidenced by language in the reauthorization of IDEA that mandates self-determination practices when discussing transition services for students during IEP meetings (Field & Hoffman, 2002). These mandates are applicable to all students with disabilities. A particular challenge for students with physical disabilities is the impact of learned helplessness on the development of self-determination skills.

Characteristics of learned helplessness in those with significant physical disabilities can be a major obstacle in the development of self-determination skills. Learned helplessness has been defined as the belief that any response provided by an individual will be ineffective (Maier & Seligman, 1976). For students with physical disabilities, this belief develops as a result of their inherent need to depend on others for physical activities that they are unable to perform by themselves, due to their physical disability. Over time, and with repeated attempts to perform a task that result in failure, or are not completed in a timely manner as judged by themselves and others, the individual

may lose any motivation to initiate or attempt a task on his own (Abramson et al., 1978; Best, 2009; Heller, 2009; Heller & Gargiulo, 2009). Dependence on caregivers fosters this sense of learned helplessness, and the individuals learn through repetition that they are incapable of doing things for themselves. This belief develops independent of evidence that indicates otherwise. The individual's perception of himself as incapable is reinforced by the actions and comments of others who step in to perform tasks for that individual. The amount of energy and effort that the individual with physical disabilities must exert to perform tasks may be frustrating and exhausting, leading the individual to believe that it is simply easier and more efficient to allow others to do things for him.

Lack of instruction in self-determination can actually foster or reinforce learned helplessness (Angell et al., 2010; Heller et al., 1996). Thus, it is imperative that instruction in the skills of self-determination begin at an early age, to combat the development of learned helplessness (Chambers et al., 2007; Erwin & Brown, 2003; Kleinert et al., 2010; Palmer & Wehmeyer, 2003; Sands & Doll, 1996; Wehmeyer & Palmer, 2002).

Self-determination has been defined as the ability to act for oneself, with an understanding of one's own strengths and weaknesses, without being pressured or negatively influenced by others as one makes decisions about one's needs and desires. (Field & Hoffman, 2002; Karvonen et al., 2004; Wehmeyer & Palmer, 2002). The provision of instruction that teaches self-determination skills is now recognized as an important component when developing programs for students with disabilities (Field & Hoffman, 2002; Karvonen et al., 2004; Wehmeyer et al., 2000). Wehmeyer (1999) identified a number of components of self-determination that lend themselves to



instruction, one of which is the development of self-advocacy skills. In the conceptual framework for self-advocacy developed by Test et al., (2005), communication was identified as one of the key elements, which includes the ability to effectively initiate requests.

As seen in Figure 1, the elements of self-determination include: (a) choice making, (b) decision making, (c) problem solving, (d) goal setting, (e) self-observation and assessment, (f) self-knowledge, and (g) self-advocacy. One of the components of self-determination that lends itself easily to instruction is self-advocacy (Fiedler & Danneker, 2007).

Test et al. (2005) developed a conceptual framework for self-advocacy, which includes knowledge of self, knowledge of rights, leadership, and communication. Within each component of the model, there are subcomponents which can be targeted for instruction.

Subcomponents of knowledge of self include the ability to recognize one's strengths and needs and the ability to persist in setting and obtaining self-identified goals. This requires that individuals be able to advocate for themselves as they work to achieve their goals. Knowledge of self is viewed as a foundational component of the conceptual framework of self-advocacy developed by Test et al. (2005). Before one can self-advocate clearly and effectively, an accurate and realistic knowledge of self is essential (Wehmeyer & Shalock, 2001). Instruction can and should be provided to promote accurate self-knowledge. Instruction has been provided for populations that include

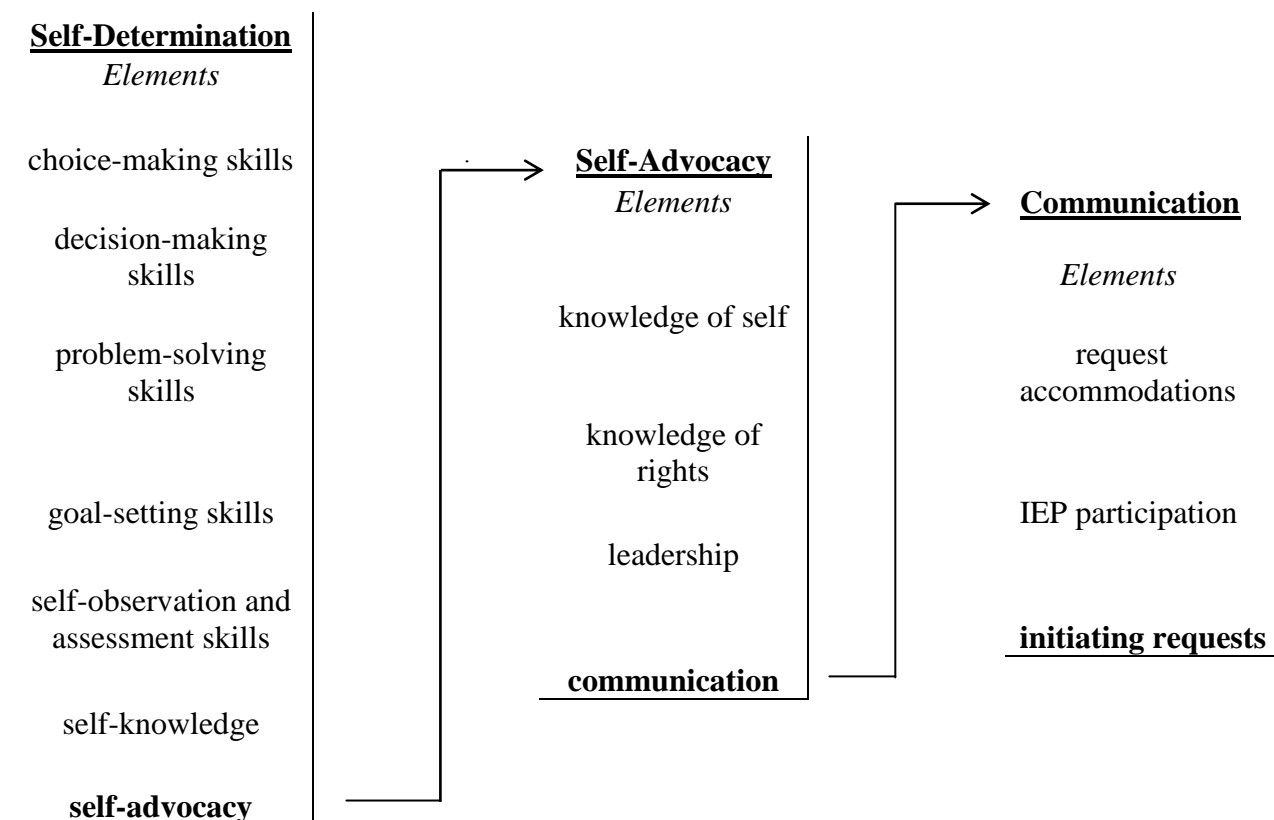


Figure 1. Elements of Self-Determination.

students with intellectual disabilities (Abery et al., 1995) and students with learning disabilities (Durlak et al., 1994; Roffman et al., 2010). Trainor (2007) stressed the importance of the development of accurate self-knowledge. Inaccuracy can lead to goal setting that is inappropriate and unobtainable. For students with physical disabilities, inaccurate knowledge of self may occur as parents and others close to the individual attempt to encourage the individual by providing inaccurate feedback on abilities (Clark et al., 2010). A lack of exposure to typical peers as a result of school placement and lack of opportunity to engage in activities with their peers due to physical limitations, also may lead to inaccurate self-knowledge, and thus to the development of inappropriate

goals. It is evident that knowledge of self is of primary importance in the development of self-advocacy skills for a diverse population of students with disabilities.

Subcomponents of knowledge of rights include items often associated with civil rights, such as knowledge of personal rights, human rights, and educational rights. Instruction in rights and responsibilities, particularly knowledge of legal rights guaranteed to individuals with disabilities (e.g., IDEA, Section 504, ADA) is important in order for students with disabilities to be able to advocate for themselves, particularly as they transition into adult roles. Phillips (1990), Brinckerhoff (1994), Abery et al., (1995), Rumrill (1999), and Powers et al. (1995) have all reported on the effects of instruction on the level of knowledge of rights for individuals with disabilities. The instruction was aimed at individuals in high school or college, perhaps as a function of the complexity of the material being presented. Evidence suggests that instruction in rights for individual with disabilities is a vital component in the development of self-advocacy skills.

The subcomponent of leadership involves skills that will allow the individual to move beyond self-advocacy to advocacy for others. Initial leadership experience often occurs during development of an IEP, where the student directs the meeting, proposes goals and objectives, and requests accommodations (Fiedler & Danneker, 2007; Field & Hoffman, 2002). However, it is important to recognize that effective self-advocacy does not require the ability to take on a leadership role (Test et al., 2005).

The subcomponents of communication are supported by the individual's knowledge of self and knowledge of rights (Test et al., 2005). These subcomponents rest on the individual's knowledge of self and knowledge of rights. Once the individual has established an accurate understanding of his abilities and rights, he can advocate for

needed accommodations or assistance in a variety of venues, including educational and community settings. Once he has the knowledge, it is imperative that he be able to communicate those requirements effectively.

### **Self-Advocacy and Initiation of Requests**

Kleinert et al., (2010) identified the ability to effectively communicate requests as an essential element for a majority of the components of self-determination, including the self-advocacy component. Communication can be verbal, non-verbal, even written, depending on the abilities of the students (Abery et al., 1995; White & Thompson, 1997). For students with severe physical disabilities that may affect their ability to communicate, this becomes a critical area for instruction. For students with severely impaired communication skills, accommodations that include the use of alternative forms of communication, including sign language or augmentative communication devices, is important. For students with severe physical disabilities, the ability to communicate effectively can provide an avenue for them to self-direct their care (e.g., direct a caregiver in the steps for tube feeding) (Best, 2009) as well as initiate requests for accommodations in the classroom (e.g., ask to be moved to a position that allows them to view a presentation by a teacher or peers) (Heller & Gargiulo, 2009). Communication abilities, including the ability to recognize a need and effectively initiate a request for that need to be fulfilled, are key to the development of self-advocacy skills for students with severe physical and communication disabilities.

Student participation in IEP meetings (IDEA mandate beginning at age 14), and the development of self-advocacy skills (one of the components of self-determination identified by Wehmeyer, 1999) that will promote a successful transition to post-school

adult roles and responsibilities in the community most often have been the focus of instruction, with students typically being middle to high school age, or older (Clark et al., 2010; Fiedler & Danneker, 2007; Test et al., 2005). Students with learning disabilities and intellectual disabilities usually have been the target populations for instruction in self-determination skills (Angell et al., 2010; Clark et al., 2010; Fiedler & Danneker, 2007; Field & Hoffman, 2002; Karvonen et al., 2004; Test et al., 2005; Van-Belle et al., 2006). Other populations of students with disabilities, including those with physical disabilities are in need of instruction as well. This need has been voiced by educators as well as adults with physical disabilities (Angell et al., 2010; MacDonald & Block, 2005; Stoner, Angell, House, & Goins, 2006; Roberts, 2007).

Self-advocacy is more of a challenge for individuals with physical disabilities. Often, individuals with physical disabilities have comorbid disabilities that include deficits in the area of communication (Clark et al., 2010). Erwin and Brown (2003) also recognized the negative impact of a physical disability on a young child's ability to promote self-determined behavior. For those with limited motor capabilities, the ability to effectively initiate requests for wants and needs becomes of paramount importance (Erwin & Brown, 2003; Ronski, personal communication, February 18, 2011). These skills can enable the individual with physical disabilities to take ownership of their lives, communicating to others their own needs and desires. For many individuals with physical disabilities, dependence on caregivers is a reality that will persist into adulthood (Stoner et al., 2006). Their ability to direct these caregivers is an important component in the development of their self-determination skills. Students with physical disabilities must be taught the skill of communicating their wants and needs explicitly.

One of the strategies that has shown promise in developing the skill of effective initiation of requests is the use of environmental arrangement (Heller et al., 1996; Kaiser & Grim, 2006; McCathren, 2000; Olive et al., 2007). Environmental arrangement can involve a number of different strategies to promote initiation of requests. These strategies include: (a) the use of interesting materials, (b) placing materials out of reach, (c) providing inadequate portions, (d) providing opportunities for choice making, (e) arranging activities that will require assistance, (f) and creating unexpected situations. The use of environmental arrangement strategies can create situations in which the student does not have needed materials required for completion of a task. The student then can be taught to communicate his need (e.g., the student needs a pencil to complete a written task, needs help getting his book out of his backpack).

### **Intervention Studies**

**Studies using environmental arrangement.** Several studies using environmental arrangement have been conducted. McCathren (2000) used environmental arrangement as part of a prelinguistic intervention to increase communication skills in a student with severe communication and cognitive delays. The student was pre-school aged, and was nonverbal, rarely initiated communication, and had limited play skills. The teacher was instructed in the use of prelinguistic milieu teaching (PMT) strategies to be used as the intervention for this study. PMT strategies include the use of environmental arrangement. In this study, toys that were identified as high-interest for the student were used to encourage initiation of requests. The toys were placed in view but out of reach, and modeling and imitation were used as strategies to promote initiation of requests for the desired toy. McCathren used a multiple baseline across behaviors design and found an

increase in the use of intentional communication by the student, including spontaneous use of signs and words.

Olive et al. (2007) used environmental arrangement to promote requesting for three children with autism who used a voice output communication aid (VOCA). Researchers used a multiple probe design across participants, with intervention occurring during 5-minute play sessions in the child's familiar classroom environment. High-interest toys were placed in sight but out of reach, and a combination of imitation and modeling strategies was used to promote initiation of requests. Using a system of most-to-least prompts, the students were instructed in the use of their VOCA to make requests. All three children increased their independent use of their VOCA to make requests during play activities.

In a study by Cohen, Allgood, Heller, and Castelle (2001) environmental arrangement strategies were used to teach three high school students with hearing loss and mild intellectual disabilities to use picture dictionaries to communicate on community-based vocational sites. Instructional strategies included preteaching of the symbols to be used in the dictionary, along with instruction in how to use the dictionaries to create simple written messages to be used with coworkers on job sites. These preintervention instruction sessions were conducted at the students' school. Intervention using environmental arrangement (specifically not having needed materials available, or an insufficient quantity of materials to complete the job task) was conducted at each student's community-based job site, using a multiple baseline probe design. All three students were successful in using the picture dictionaries to create written notes to communicate with their coworkers.

Charlop-Christy and Carpenter (2000) compared the use traditional discrete trial training, traditional incidental teaching strategies, and modified incidental teaching sessions (MITS) in conjunction with the time delay procedure to increase spontaneous speech in children with autism. Environmental arrangement (placing toys in sight but out of reach) was used in the MITS condition to promote acquisition of target phrases. Parents of three boys ages 6-9 with autism were trained in the use of MITS with their children. A multiple baseline design across and within children, with an alternating treatments design, was used to compare the three conditions. Results indicated that one student reached criterion with incidental teaching, two children reached criterion with discrete trial training, and all three students reached criterion with MITS. Additionally, only the phrases taught during MITS generalized.

**Studies using the system of least prompts.** In addition to environmental arrangement, systematic instructional strategies are important to help promote effective requesting behavior. One such strategy is the system of least prompts. A system of least prompts provides instruction with near errorless learning. The system of least prompts involves the use of a graduated prompting system to promote the acquisition of a targeted skill. Typically, the prompting system moves from the least intrusive response to the most intrusive prompt (e.g., verbal, model, physical) (Grow et al., 2009). In a study by DiCarlo and Reid (2004), the toy play of five toddlers with disabilities was increased using a system of least prompts coupled with a responsive teaching program. Three prompting levels were used during the study: a verbal prompt, a modeling prompt, and a physical prompt. A multiple baseline design was used with the first three children. Two concurrent AB designs were used with the other two children who participated in the



study. All five children increased their pretend toy play following implementation of the intervention.

Lifter, Sulzer-Azaroff, Anderson, and Cowdery (1993) taught three children with autism or autism-like behaviors pretend play activities. They evaluated the play behaviors against developmentally appropriate and age appropriate levels. A sequential treatments design was used to teach individual exemplars of specific play actions with targeted toys. The system of least prompts provided increasing levels of prompts to encourage pretend play. If the child did not initiate play when provided with a toy, a second, complementary toy was introduced. If the child still failed to initiate play, hand-over-hand prompting was used to assist the child to complete the targeted play action. All three boys were able to be successful as measured against developmental criteria. However, none of the children reached criteria for age appropriate play.

Manley, Collins, Stenhoff, and Kleinert (2008) used the system of least prompts to teach telephone skills to three elementary age students with mild to moderate intellectual disabilities. The students were taught to place a phone call as well as leave a message. A three-tier system of prompts was used for this study: (a) direct verbal prompt, (b) a direct verbal prompt paired with a model, and (c) direct verbal prompt paired with a physical prompt. A multiple probe design across subjects was used to evaluate the effectiveness of the intervention. All three students reached criterion for both types of phone calls.

### **Studies using environmental arrangement and system of least prompts.**

Several researchers have used both environmental arrangement and the system of least prompts to promote initiation of communication, including requests for materials. Heller

et al. (1996) used environmental arrangement to teach four high-school students with cognitive and visual impairments to initiate requests for materials using a combination of sign language (primary means of communication) and dual communication boards. Initiation of requests was promoted using environmental arrangement to create situations in which the student would have to request assistance in school-based settings, with generalization to work-place settings. Initiation of requests included the need for items to complete a task (e.g., items were missing or in insufficient number), or the need for assistance to actually finish the task at hand. Heller et al. used a multiple-baseline probe design, and included baseline, intervention, and generalization phases. Following intervention, all students were able to initiate requests with 80%-100% accuracy.

In a study conducted by Kasari, Freeman, and Paparella (2006), 58 children with autism, ages 3-4 years old, were taught joint attention skills and play skills. Children were placed randomly in one of three treatment groups: joint attention, symbolic play, or a control group. The system of least prompts included three levels: (a) verbal prompt, (b) model, and (c) physical prompt. Environmental arrangement were used to facilitate both social and communication responses.

Allgood, Heller, Easterbrooks, and Fredrick (2009) evaluated the use of picture dictionaries to promote initiation of requests by students with deafness and intellectual disabilities, using the system of least prompts in conjunction with environmental arrangement. Five high school students were taught to use their picture dictionaries to initiate requests for materials or assistance on job sites. The system of least prompts for this study used four levels: (a) independent, (b) gesture, (c) sign, and (d) model. Environmental arrangement strategies included: (a) a task that would require assistance

or explanation, (b) inadequate materials, and (c) lack of materials to complete the task. Researchers used a multiple baseline probe design. The students were instructed in the use of their picture dictionaries while on job sites. All students were able to use their dictionaries successfully to initiate requests for materials or assistance.

For students with physical disabilities to demonstrate self-advocacy skills, explicit instruction in this area is required. Interventions that will promote the ability to initiate requests to achieve a variety of objectives, including requesting materials to complete tasks, are needed for this population of students.

### **Purpose**

The purpose of this study was to determine if the use of environmental arrangement combined with least prompts (independent variable) would increase the effective initiation of requests for materials (dependent variable) by students with physical disabilities. Elementary age students with physical disabilities were taught to initiate requests for materials to complete typical classroom activities, using environmental arrangement and a system of least prompts as the intervention. A multiprobe baseline design was used across participants to determine the effectiveness of the intervention.

### **Research Questions**

1. Will environmental arrangement with a system of least prompts increase the effective initiation of requests for targeted materials of young students with physical disabilities?
2. Will effective requesting skills generalize to novel materials similar to those used during intervention within the school environment?

3. Will effective requesting skills generalize to novel settings within the school environment?

## **Methodology**

### **Participants**

To qualify for the study, the students had to be in elementary school (K – 5 grade) and identified as having a physical disability, either with the label of Orthopedic Impairments (OI) as defined by the state of Georgia or receiving services through the OI program (e.g., student with a traumatic brain injury [TBI] with a physical disability). Additional inclusion criteria for this study included: (a) receiving services from a teacher certified in Physical and Health Disabilities (OI); (b) no co-morbid sensory impairment requiring the services of a teacher certified in visual impairments or deaf/hard of hearing; (c) having consistent use of communication skills during typical classroom activities, including social interactions and responding to questions, as documented in the Results of Evaluations section of the student's IEP, that permit the student to ask for materials needed to complete a task, either verbally, with sign language, and/or through the use of an augmentative communication device; and (d)  $\leq 50\%$  initiation of requests.

Only six students were found to meet the inclusion criteria for the study. Baseline data were collected for these six students to determine inclusion. However, as is often the case with students with physical disabilities, frequent school absences may occur due to illness or surgeries (Heller, 2009). Two of the six students were unable to enter intervention due to absences lasting longer than one month, related to their disabilities. Therefore, only four students who met criteria were able to participate in the study. Given that a minimum of three replications is required in a multiple baseline design to show

replication and thus a functional relation between the dependent and independent variables (Kratochwill et al., 2010), the participation of four students in this study met the requirements deemed necessary to show a functional relation.

Ana was a second grade student with diagnoses of Arthrogryposis, Perisylvian syndrome, and a seizure disorder. (see Table 1.) She had repeated kindergarten. She was served in a self-contained class for students with physical disabilities. She was nonambulatory, and used a wheelchair as her primary method of mobility. She had limited hand use, but was able to point, make rudimentary signs, and use typical classroom tools (e.g., pencil, crayon) with some accommodations. She was dependent on adults for all travel within the building, as well as access to all materials and activities throughout her school day. Her seizures were poorly controlled, and increased in number, length, and frequency during the course of the study. Ana was nonverbal, and used a combination of signs, gestures, and pointing as her primary means of communication. She consistently initiated communication with her peers and with adults, and was persistent in her efforts to communicate. She often brought personal items to school that she wanted to share with her friends (e.g., toys, books, pictures), and would quickly engage in communicative attempts to share her things. Her communication was typically single signs or gestures, coupled with pointing. She rarely combined signs independently during communication, although she could combine signs while reading simple stories. She had access to an Augmentative and Alternative Communication device (AAC) which she used primarily to respond in academic situations. She did not like it and preferred to use signs and pointing to communicate.

Table 1

*Student Demographics*

Name	Age	Grade	Disability	Communication mode	Reliable means of response	Primary behavior to request items
Ana	8	2nd	Arthrogryposis, Perisylvian Syndrome, seizure disorder	Signs, gestures, pointing, AAC device	Signs	Ineffective gestures
Bill	9	2nd	Traumatic brain injury, left-side hemiparesis, seizure disorder, ADHD	Verbal	Verbal	unrelated comments
Carlos	7	1st	Stroke in utero, right-side hemiparesis, seizure disorder	Verbal	Verbal	Passively wait/unrelated comments
Dan	7	1st	Cerebral palsy, autism, seizure disorder	Signs, gestures, pointing, AAC device	Signs	Ineffective gestures

Bill was a second grade student who sustained a traumatic brain injury at the age of 14 months. As a result of this injury, he had left-side hemiparesis, and a prosthetic skull implant on the right side. He was served in a self-contained classroom for students with physical disabilities. Bill had a history of seizures related to the time of the injury, and was on seizure medication. During the study, he experienced multiple break-through

seizures, and was hospitalized briefly in order to bring the seizures under better control. He was also on medication for ADHD. He was ambulatory, and had adapted well to the hemiparesis. Bill was verbal, although very impulsive, and often had difficulty staying on topic. He initiated communication with his peers and with adults, although not always in an appropriate manner (e.g., talked out of turn, spoke very loudly, interrupted others). He usually searched for needed items rather than asked for them and became frustrated when he could not find what he wanted. He required cuing to initiate requests and identify what he wanted, and his difficulty with word-finding could sometimes make this a challenging activity for him.

Carlos was a first grade student who had sustained a stroke in utero, resulting in right-sided hemiparesis, as well as new onset seizure disorder. He was not on any medication. He was served in a regular education first grade classroom. Carlos was ambulatory, although he had a marked gait abnormality. He wore braces on his right foot and hand and needed frequent reminders to use his right hand as an assist when completing fine motor tasks. He was verbal, although he was very shy and spoke very softly. He did not initiate communication very often with his peers, although he responded if a peer initiated conversation. He was very passive and waited for a teacher or peer to recognize that he needed assistance rather than asking for it himself. Often he completed an activity incorrectly because he did not ask for assistance when he did not understand the activity. He would try to copy a peer's work rather than ask for assistance.

Dan was a first grade student with diagnoses of cerebral palsy and autism, as well as a seizure disorder. He was served in a self-contained classroom for students with physical disabilities. He was ambulatory, although very unsteady while walking and

required adult stand-by guard whenever he walked in the classroom or hallways. He had very poor hand use, with marked tremoring when attempting any fine motor task. He was dependent on adults for all activities of daily living, as well as access to all classroom materials and activities. Dan also exhibited behaviors that interfered with his learning, including refusal to comply with teacher direction, disruptive behavior, and defiance. He was on a classroom behavior plan to address these behaviors. This student was nonverbal, and used a combination of rudimentary signs, gestures, and pointing to communicate. Typically, he used single signs, or attempted to pull a peer or adult to the item of interest to him. He became frustrated when he was not understood, but persisted in attempting to communicate. He initiated communication most often with adults, as his peers struggled to understand him and needed adult assistance to interact with him. Dan had access to an AAC device, although he used it primarily as a toy, playing games or music on it, even when asked to use it during academic activities. For example, when asked a question that required him to use his device to answer, he would stare at the adult, smile, then quickly navigate to a favorite song and play that, squealing with laughter when told that was inappropriate, and that he needed to answer the question. He would then push the device away and refuse to respond. However, when reminded about the consequence of his behavior, and depending on how strongly he wanted the desired reward, he could quickly comply and respond appropriately.

### **Setting**

**Primary setting.** The intervention occurred in the students' typical classroom environments. One student was served in an inclusive general education classroom, while the other three were served in the same self-contained classroom for students with



physical disabilities. The student who was served in the general education setting received support from the Orthopedic Impairments (OI) program. This support included the use of an assigned paraprofessional. Additional support included collaborative teaching (a general education teacher and a teacher certified in physical disabilities) for specified objectives and designated time periods throughout the school day. Students in the self-contained setting received instruction from a teacher certified in physical disabilities. Additional support was provided by trained paraprofessionals in the self-contained classroom.

Intervention was conducted in the students' primary classroom, with generalization data collected in the same environment using materials similar to those targeted for use during intervention. The primary classroom was either the student's inclusive general education classroom (e.g., first grade classroom) or the self-contained OI classroom. Intervention was scheduled in order that other students involved in the study who may be in the same classroom were not present during intervention for their peers.

Delivery of the intervention in the natural setting is preferred, as the skill can be acquired most easily when taught in everyday settings with familiar materials and people (Kaiser & Grim, 2006). For students who are exhibiting characteristics of learned helplessness, repeated exposure to situations which will require the desired response (initiation of requests for materials) in naturally occurring settings will promote self-advocacy skills and lessen passive behavioral patterns.

**Novel setting.** Students sometimes have difficulty transferring a new skill to a different setting. Students' abilities to generalize requesting skills in novel settings was

assessed through the use of environmental arrangement, targeting materials from Set A and Set B (referred to as Set C) in novel settings that included math specials class and the media center.

### **Materials**

Students were taught to initiate requests using common classroom materials. Each student had his or her own individualized material sets that were used to complete typical classroom and school activities. These included any items specific to that student.

Three sets of materials were identified for each participant, with three items in each set (see Table 2). The materials selected for each student were materials that were used by that student on a regular basis, and which that student was unable to obtain independently. Set A and Set B consisted of similar materials. Set C consisted of a mixture of Set A and Set B materials.

### **Generalization of Materials**

For students to benefit from the ability to initiate requests, they need to be able to do this across a variety of materials. After students reached criteria on the intervention set of materials (Set A), a generalization set of materials (Set B) was introduced.

Generalization was considered to have occurred if on the first session of the new materials, students were able to initiate requests independently when environmental arrangement strategies were employed. If students were not successful, the same procedure of least prompts (with environmental strategies) occurred as with the initial set of materials.

Table 2

*Materials Sets for Use Each Student*

Student	Set A	Set B
Ana	backpack crayon mouse	reading bag pencil mimio stylus
Bill	mouse alphasmart schedule folder	mimio stylus keyboard daily folder
Carlos	pencil class worksheet unfinished work folder	colored pencil daily behavior sheet writing folder
Dan	keyboard schedule folder reading bag	AAC device daily folder backpack

**Procedure**

**Preintervention.** Prior to intervention, the students were assessed as to their reliable means of response and time delay, as well as their baseline requesting behavior. A self-advocacy checklist (Sheets & Gold, 2003, p. 24) was administered during preintervention, and again following the completion of the study (see Appendix A).

**Reliable means of response.** Each student's reliable means of response (RMR) was assessed prior to intervention (Heller & Alberto, 2010). A reliable means of response refers to a student's ability to use communication skills during typical classroom activities, including social interactions and responding to questions, on a consistent basis, without prompting. Information garnered through review of each student's IEP,

specifically those sections relating to communication as assessed by the speech language therapist, was used to identify the student's primary mode of communication (e.g., verbal, signs and gestures, AAC). Additional information was gathered by evaluating: (a) the student's ability to answer 10 known questions accurately using a RMR, (b) the student's ability to respond with the needed vocabulary with their RMR, and (c) the amount of time it took the student to respond from the time of a known question being asked to the response of the student.

***Response to questions.*** Student performance on the ability to answer ten known questions (e.g., identify common objects, spell their first name), was used to confirm the student's RMR. The student's use of needed vocabulary was assessed during this part of the evaluation as well. Having the correct vocabulary was needed in order for the RMR to be used for this study.

***Response delay.*** Individual student prompt intervals were determined during the assessment of known questions. This interval was calculated based on the average amount of time it took each participant to respond to ten known questions. This interval was used during intervention as a part of the system of least prompts strategy.

***Independence of initiation of requests.*** In order to be included in this study, a student's initiation behavior (e.g., effectively request needed materials) was required to be  $\leq 50\%$  of presented opportunities. Data on each student's current performance of the initiation of a request for assistance was taken. While many students will initiate interactions with others (e.g., saying hi as a friend enters the classroom) it was the student's performance of initiation of requests for specific materials required in order to follow a direction that was assessed for this study.

Students were observed in their primary classroom setting. Data were collected on the number of times a student initiated a request for materials. If a student required material but did not ask for it within a time period determined based on individual student response time, the material was provided. The material was placed out of reach of the student, or was missing, in order to promote the initiation of a request. Six trials were conducted per session, using materials identified for each student. A minimum of five sessions were conducted. No instruction was provided during preintervention. These data were used to determine eligibility for inclusion in the study, and also served as baseline.

*Self-advocacy checklist.* A checklist was administered to assess students' perceptions of their own self-advocacy skills. This checklist was comprised of seven questions; four questions which targeted self-advocacy skills, and three questions which served as distractors. Responses were scored on a 4-point Likert scale (with 4 being student does it a lot, and 1 being student needs someone to tell him or her do it for the student. Each student was presented with each of the items verbally (e.g., "Ann, do you tell people what you need? Do you do it a lot, sometimes, a little, or do you need someone to do that for you?"). The student responded using their RMR (e.g., responded verbally or using signs), and their response was noted on the checklist. For the question concerning IEP needs, the students were asked prior to the meeting what they thought their parents and the teacher should talk about. Specifically, they were asked what they thought they needed to work on at school. Due to their young age the students did not attend the actual meeting, so their participation occurred prior to the meeting through questioning.

**Intervention procedures.** The intervention consisted of environmental arrangement strategies coupled with explicit instruction using a system of least prompts. Data were taken on the presence of the target behavior and incorrect responses.

*Environmental arrangement.* Kaiser and Grim (2006) described six strategies to promote initiation of requests, and two of these were selected for this study (a) placing materials out of reach, and (b) arranging activities that will require assistance. Creating an environment in which required materials are not available (e.g., inadequate portions, missing materials) or are out of reach were a part of the intervention package. These two strategies were selected based on the characteristics of the students who were selected for this study. Specifically, students with physical disabilities are often limited in their ability to obtain materials for themselves. This limitation is a function of their disability, and is often accompanied by characteristics of learned helplessness.

For each participant in this study, common daily activities were identified in which the student required materials to complete a task. A master list for each student was developed. Each list was comprised of items which are used during a typical school day and were targeted for the intervention (one session = six opportunities across one school day). These opportunities were a mixture of requesting situations (e.g., student is not able to physically complete a task such as unpacking his backpack unless it is taken off the back of his wheelchair and placed within his reach, student needs to complete an assignment but does not have the needed item – pencil for writing, scissors for cutting). Students were given instructions that could not be followed due to missing material (e.g., please write your name at the top of this page, but there is no pencil within reach) or material that was out of reach (e.g., please get your library books out and place them on

this desk, but the student cannot reach into his book bag to get the book) for those identified activities.

*System of least prompts.* A system of least prompts was used to provide instruction with near errorless learning. For this study, the system of least prompts proceeded as follows: (a) independent, (b) verbal – restatement of direction, (c) indirect verbal (Gast & Wolery, 1990), and (d) verbal/model. A set response interval was also established. Following the initial direction, a specified time interval was allowed to elapse before the first of the prompts was implemented. If the student did not respond to the initial direction, then the first prompt was delivered. If the student did not respond within the designated time interval following the first prompt, the second prompt in the system was delivered. This process was followed until the desired response was exhibited by the student. The prompt interval for this study was determined based on individual student characteristics. Grow et al. (2009) recommended that the response interval be based on the amount of time that the individual student may need to complete the given activity, in conjunction with the amount of time that the individual student typically requires to respond to a direction. For example, students with physical disabilities who require the use of augmentative communication systems may require more time to initiate and complete a request than students who are able to verbalize their requests.

For example, Ana was given an instruction to turn in her homework, but she was unable to reach her backpack which was hanging on the back of her wheelchair. If she asked for the backpack within the specified time period, she was handed her backpack, her response was considered (a) independent, and was scored as a correct response. If she did not initiate the request for her backpack within the designated time period, the

direction was repeated (e.g., “Ana, please turn in your homework”). If she initiated the request for her backpack within the designated time period following the (b) verbal – restatement of direction, the backpack was handed to her, but the response was scored as incorrect. If Ana still did not initiate the request for her backpack following the repeated direction, within the designated time period, an (c) indirect verbal cue was provided (e.g., “What are you supposed to say?”, “What are you supposed to ask for now?”). If she then initiated the request for the backpack, it was provided, but the response was scored as incorrect. If Ana did not initiate the request for the backpack following the indirect verbal cue, within the designated time period, she was provided with (d) a verbal model (e.g., “Ana, you need to say I need my backpack.”) and instructed to repeat the model. This response was also scored as incorrect. If at any point during the trial, Ana asked for the wrong material, repeated the request in an unacceptable format (e.g., I need help without specifying the material required), or in any other manner did not initiate a request in the designated format, the verbal model was provided as correction and the student was guided to produce the correct format of the request. This trial was scored as incorrect.

A correct response was defined as the student requesting the needed material using specific language. The request could be made verbally or by using sign language. A student who was verbal was taught to request missing material by stating a stem, (e.g., “I need .....”, “Can you please get me .....” ) followed by naming the material needed (e.g., my pencil, the crayons, my backpack). If a student used sign language, he or she was taught to request the material by signing the stem, and either signing the name of the required material, or gesturing/miming its use (e.g., the student may not have known the specific sign for pencil, but mimed writing his name as a means of indicating what was



required). It was not enough for the student to simply state “I need help,” as this fosters dependence on others to then determine what it is that the student needs.

**Target behavior & incorrect responses.** As previously stated, the target behavior consisted of a requesting stem (e.g., I need) plus the targeted item. This was determined to be the most effective way to initiate a request of an item since it did not require the use of another individual to try to determine what the student was trying to communicate (or not communicate). There were several incorrect responses that could occur. These included: (a) passive waiting, (b) ineffective gestures, (c) unrelated comments, and (d) a partial communication in which the student communicated using the requesting stem (e.g., I need or I need something) or made a comment by saying the item name.

**Procedural fidelity.** Checklists designed to assess fidelity of the implementation of the intervention and data collection were used during intervention and generalization (see Appendix D). Collection of fidelity of implementation data occurred during 33 % of each phase. The checklist consisted of the steps to be followed to implement the intervention. Each step was scored as being implemented correctly or incorrectly. Fidelity of implementation was calculated using the following formula:

$$\frac{\text{\# of steps intervention implemented correctly}}{\text{\# of total intervention steps}} \times 100 \quad \text{converted to percent}$$

Procedural fidelity was 100% for all students across all phases.

**Data collection procedures.** Data were collected by the researcher, OI paraprofessionals, and the regular education teacher who were trained in implementation of the intervention as well as data collection (see Appendix B). The training included instruction in the use of environmental arrangement and the system of least prompts, as well as data collection. Notebooks were developed that contained explicit directions in

the use of environmental arrangement for each participant, including what materials were to be used during each phase, how the environment would be arranged to prompt the initiation of requests, the specific cues to be used for each participant and each material, and the specific language and method of communication to be used by the participant when initiating a request. Specific information on the prompting levels to be used was included in the notebook, along with examples of correct and incorrect responses. Sample data collection sheets were included, and role play situations were conducted in order for data collectors to have the opportunity to rehearse prior to the start of the study. After being trained on the material in the notebook, personnel collecting data were considered ready to assist in the study when they reached 100% on a competency checklist. The checklist consisted of items to be demonstrated during role play situations, as well as written responses to questions requiring detailed, individual student information, including the completion of data collection sheets for each phase of this study (see Appendix C).

***Interobserver agreement.*** Point-by-point agreement (e.g., agreement on whether the student's response was correct or incorrect) was used to calculate interobserver agreement (IOA) for this study (Kazdin, 1982). The formula for calculating point-by-point agreement is as follows:

$$\text{Point-by-Point Agreement} = \frac{A}{A+D} \times 100 \text{ converted to percent}$$

In this formula A = observer agreement on the response (scored as correct or incorrect) and D = observer disagreement on the response.

For a minimum of 33% of the sessions the occurrence or nonoccurrence of the desired response was scored by a primary and a secondary observer. Data were collected

during baseline, intervention, and generalization phases. Interobserver agreement was calculated using point-by-point agreement across baseline, intervention, and generalization phases for all students. Baseline IOA was at 92% for Ana, 96% for Bill, 100% for Carlos, and 96% for Dan. IOA during the intervention phase was at 100% for Ana, Carlos, and Dan. IOA was calculated at 89% for Bill during the intervention phase. IOA was calculated for Ana, Bill, and Carlos during the generalization phase, and was at 100% for Ana and Bill, and at 92% for Carlos.

### **Research Design**

A multiprobe multiple baseline across participants design was used for this study (Kennedy, 2005, Kratochwill et. al., 2010). Use of a multiple baseline design does not require the withdrawal of the intervention, which is useful in a case where a newly learned behavior (e.g., requesting materials) cannot be unlearned. Visual analysis of graphed results was used to evaluate the effectiveness of the use of environmental arrangement coupled with a system of least prompts to promote the initiation of requests for materials by students with physical disabilities. Visual analysis included (1) level, (2) trend, (3) immediacy of the effect, and (4) consistency of data patterns across similar phases. The graph shows the results as a percentage of correct initiation of requests for materials for each session during all phases. Data were also examined in regard to the type of incorrect responses students made during the study. The percentage of each error type was calculated and examined to see how these changed from baseline and throughout intervention. This included session-by-session comparison throughout intervention and generalization.

Each session consisted of six trials, and the percentage of correct responses was recorded for each session. For some students, incidents such as the occurrence of seizures or absences related to their medical needs resulted in sessions comprised of less than six trials. These sessions are marked on the graph with an arrow.

**Baseline.** Baseline data were collected on all students, with results reported corresponding to the number of times in six opportunities that the student initiated a request for materials during each session. Each session was comprised of six opportunities to request materials. No instruction was provided during this phase. All materials from all sets were used during this phase. Each item was assessed once during each session, for a total of six items per session. A minimum of five data collection sessions were conducted during the baseline phase in the primary setting, with one additional session being conducted in the generalization setting. Once data were stable for student one, or all of the data were below the criteria of  $\leq 50\%$  that student entered the intervention phase. All other students remained in the baseline phase. Subsequent students entered intervention once the prior student had reached criteria in the intervention phase.

**Intervention.** After baseline, intervention using environmental arrangement and a system of least prompts to teach requesting began. Specific materials selected for use for each student were used during this phase, and identified as Set A. Baseline data were collected on the remaining students during this phase. The order in which the students entered intervention was based upon random assignment using a random table generator.

Criteria were set at 100% for one session or 80% or above for 3 consecutive sessions. A minimum of five intervention sessions were conducted in order to promote

generalization. If a student reached mastery criteria of 100% prior to completing five sessions, but was no longer at mastery criteria at the completion of five sessions, then intervention was continued until mastery criteria was met again. Once Student One reached criteria, Student Two entered intervention. This procedure was repeated for each student in the study. If a student failed to reach criteria within 10 sessions, intervention was stopped for that student.

**Similar Materials and Generalization.** Generalization data were collected after participants met mastery criteria in the intervention phase, using materials that were similar to those used during the intervention phase. The materials used in this phase were specific to each student, and were identified as Set B. Environmental arrangement was used to assess requesting behaviors. Instruction was delivered until the student reached criteria (100% for one session or 80% or above for 3 consecutive sessions). A minimum of five generalization sessions were conducted.

**Novel Setting Probe.** Following the materials generalization phase, one probe session was conducted for each student to assess the transfer of skills to a novel setting (e.g., math specials class). The materials used during the probe session were a combination of materials from Sets A and B, and were referred to as Set C. The probe session was conducted for assessment purposes only. A score of 80% or better indicated that generalization of requesting behavior to a novel setting had occurred.

## **Results**

The purpose of this study was to examine the effectiveness of the use of environmental arrangement coupled with a system of least prompts (independent variable) to increase the effective initiation of requests for materials (dependent variable)

by students with physical disabilities. Sets of materials were created based on individual student characteristics and needs. Generalization to a new set of materials was examined, using materials that were similar to the original set. Following generalization, probes were conducted in novel settings using the previously designated materials in order to determine whether students would transfer the skill of initiating requests to the new settings effectively.

A multiprobe multiple baseline across participants design was used for this study. Data included performance during baseline, intervention, and generalization phases and was graphed for the four students. Data were analyzed through visual analysis of the graph and showed that the use of environmental arrangement in conjunction with a system of least prompts was effective in promoting the initiation of requests for materials for three out of the four students with physical disabilities (see Figure 2).

### **Ana**

During baseline, the percentage of independent effective initiation of requests remained at 0% across six sessions (see Table 3). The predominant method she used to indicate that she needed a material was through ineffective gesturing (e.g., she responded by either pointing to the general area of the required item or by pointing to the wrong area or wrong item). During intervention, Ana's responses transitioned quickly from ineffective gestures and minimal passive waiting to correct initiation of requests, and she was able to reach criteria at session nine. On the final session of intervention Ana had a seizure during one of the trials and was unable to complete that trial. For this session percentage was calculated based on five trials. Ana was able to generalize initiation of

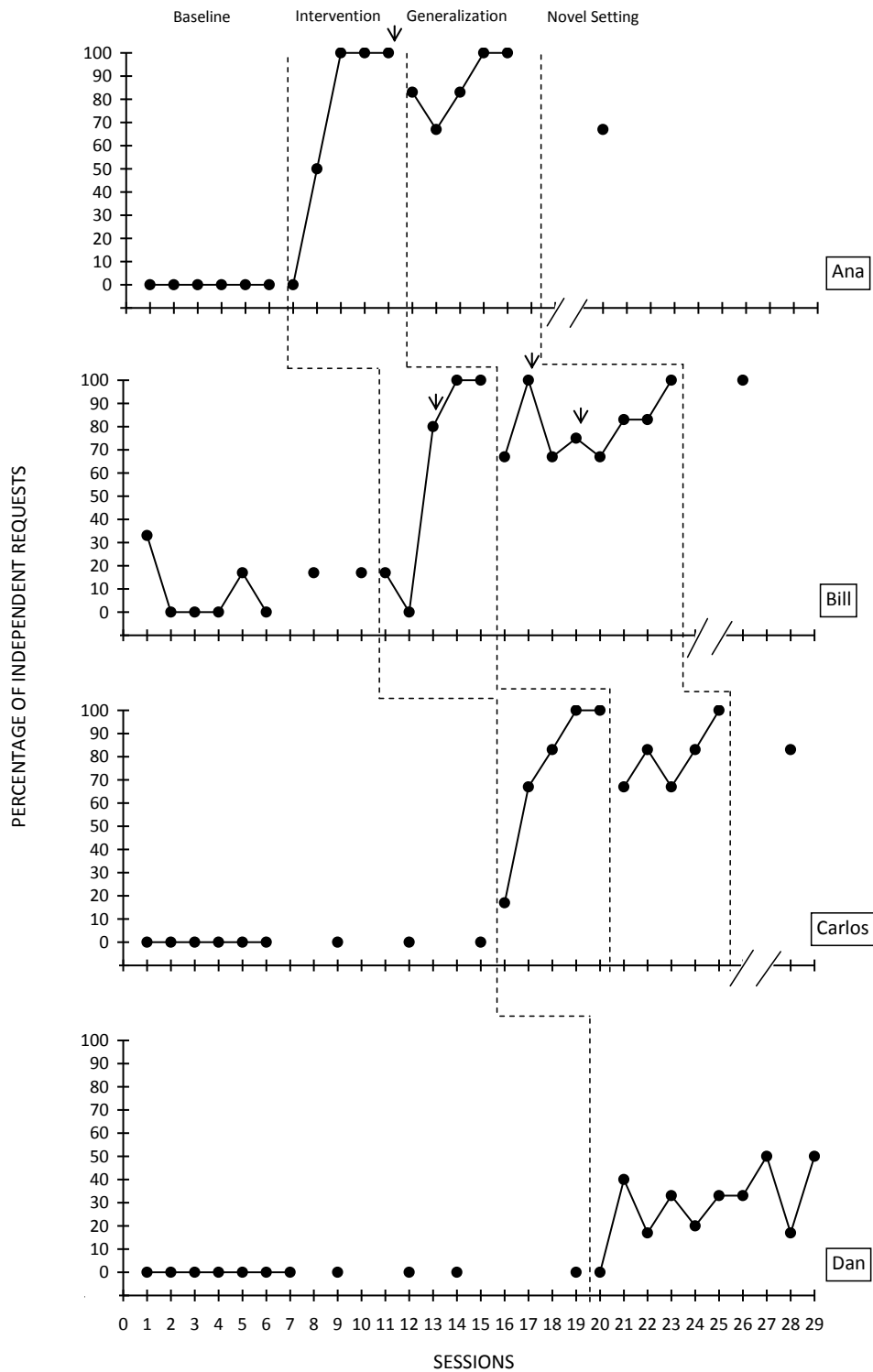


Figure 2. Percentage of independent initiation of requests by participants across all phases (baseline, intervention, generalization, and probes). Arrows indicate sessions comprised of less than six trials.

Table 3

*Ana's Response Types Across All Phases*

Phase	Session	Passive waiting %	Ineffective gesture %	Unrelated comment %	Partial request %	Correct initiation %
Baseline	1-6	33	67	0	0	0
Intervention	7	33	50	0	17	0
	8	33	17	0	0	50
	9	0	0	0	0	100
	10	0	0	0	0	100
	11	0	0	0	0	100
Generalization	12	0	17	0	0	83
	13	17	0	0	17	67
	14	17	0	0	0	83
	15	0	0	0	0	100
	16	0	0	0	0	100
Probe	20	33	0	0	0	67

requests to new materials, reaching criteria at session 15. During this phase her error types were minimal and included passive waiting, ineffective gestures, and partial requests. A probe was conducted at session 18 using previous materials in a novel setting. Ana was able to generalize to the new setting with some success, demonstrating passive waiting as the only error type.

**Bill**

During baseline, the percentage of independent effective initiation of requests scored as incorrect ranged from 0% to 33% across eight sessions (see Table 4). The predominant response Bill used during baseline was through making unrelated comments (e.g., asking if it was time for his medicine, for snack, commenting on another student's



Table 4

*Bill's Response Types Across All Phases*

Phase	Session	Passive waiting %	Ineffective gesture %	Unrelated comment %	Partial request %	Correct initiation %
Baseline	1-10	25	0	61	4	10
Intervention	11	16	0	67	0	17
	12	17	0	83	0	0
	13	0	0	20	0	80
	14	0	0	0	0	100
	15	0	0	0	0	100
Generalization	16	0	0	33	0	67
	17	0	0	0	0	100
	18	0	0	16	17	67
	19	25	0	0	0	75
	20	0	0	33	0	67
	21	0	0	0	17	83
	22	0	0	17	0	83
	23	0	0	0	0	100
Probe	26	0	0	0	0	100

activity). During intervention, Bill's responses continued to be dominated by making unrelated comments during sessions 11 and 12. At session 13 Bill's responses shifted to correct initiation of requests for 80% of his responses. It should be noted that Bill was only able to complete five trials during session 13 due to an early dismissal that day related to a medical need. He reached criteria at session 14 with 100% accuracy. Bill was able to generalize initiation of requests to new materials, reaching criteria at session 17. Bill did not demonstrate a predominant error type during the generalization phase, exhibiting passive waiting, unrelated comments, and partial requests throughout the phase. Session 17 was comprised of five trials, due to a scheduling conflict that prohibited the completion of the sixth trial. During session 19 of intervention Bill

exhibited suspected seizure activity and was taken to the emergency room. Only four trials were completed during this session. At the end of five sessions of generalization Bill was no longer at criteria, with response accuracy ranging from 67% to 75% across the last three sessions. Therefore, instruction continued until Bill met criteria again, which occurred at session 23. A probe was conducted at session 26 using previous materials in a novel setting. Bill was able to generalize to the new setting with 100% accuracy.

### **Carlos**

During baseline, Carlos's percentage of independent initiation of requests remained constant at 0% across nine probe sessions (see Table 5). The predominant error types he when asked to complete a task for which he did not have the needed materials were through waiting passively for the needed material or making unrelated comments (e.g., stating "I can't" or asking "Where is it?" rather than making a request for the material). During intervention, Carlos's responses shifted quickly to predominantly making unrelated comments before transitioning to correct initiation at session 19. During generalization, Carlos continued to make unrelated comments as his predominant response type during this phase. He was able to meet criteria during generalization at session 25. A probe was conducted at session 28 using previous materials in a novel setting. Carlos was able to generalize to the new setting with 83% accuracy, demonstrating unrelated comments as the only error type.

### **Dan**

During baseline, Dan's percentage of independent initiation of requests remained

Table 5

*Carlos's Response Types Across All Phases*

Phase	Session	Passive waiting %	Ineffective gesture %	Unrelated comment %	Partial request %	Correct initiation %
Baseline	1-15	50	0	50	0	0
Intervention	16	17	0	67	0	16
	17	0	0	33	0	67
	18	0	0	17	0	83
	19	0	0	0	0	100
	20	0	0	0	0	100
Generalization	21	0	0	33	0	67
	22	0	0	17	0	83
	23	0	0	33	0	67
	24	30	0	17	0	83
	25	0	0	0	0	100
Probe	28	0	0	17	0	83

constant at 0% across 11 probe sessions (see Table 6). The predominant method he used to indicate that he needed a material was through ineffective gesturing (e.g., he would point in the general direction of the material he required). During intervention Dan's response type shifted quickly to passive waiting, and was the predominant response type for the 10 sessions of intervention. Dan did not reach criteria after ten sessions of intervention, nor did he have a positive trend in the data. Therefore Dan's participation in the study was terminated per the intervention procedure as detailed in the research design. (If a student failed to reach criteria within 10 sessions, intervention was stopped for that student).

Table 6

*Dan's Response Types Across All Phases*

Phase	Session	Passive waiting %	Ineffective gesture %	Unrelated comment %	Partial request %	Correct initiation %
Baseline	1-19	40	58	0	2	0
Intervention	20	67	33	0	0	0
	21	40	20	0	0	40
	22	67	16	0	0	17
	23	67	0	0	0	33
	24	80	0	0	0	20
	25	67	0	0	0	33
	26	67	0	0	0	33
	27	50	0	0	0	50
	28	67	16	0	0	17
	29	50	0	0	0	50

**Social Validity**

The self-advocacy checklist that was administered prior to the start of the study as a part of the preintervention procedures, and again following the completion of the study, served as one measure of social validity. Results were analyzed to determine whether any change had occurred during the course of the study in student self-awareness of self-advocacy abilities. The self-advocacy checklist was comprised of seven questions; four questions which targeted self-advocacy skills, and three questions which served as distractors. Responses were scored on a 4-point Likert scale (with 4 being “student does it a lot”, and 1 being “student needs someone to tell them or do it for them. The responses to the four relevant items preintervention and postintervention are seen in Table 7.

Student responses across questions were variable. Ana's responses indicated improvement in only one area; that of requesting needs during IEP meetings. She

Table 7

*Student responses to self-advocacy checklist items preintervention and postintervention.*

Questions	Ana		Bill		Carlos		Dan	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Tell about needs	4	1	4	4	3	4	1	3
Tell about IEP needs	1	3	1	1	1	1	1	3
ask for help from others	2	2	4	3	1	2	4	1
Tell about medical needs	1	1	4	4	4	4	1	3

*Note.* 1=max assist; 2=a little; 3=sometimes; 4=a lot.

indicated a regression in her performance for requesting general needs (e.g., materials required to complete activities). Her self-ratings for questions concerning asking for help (does a little) and stating medical needs (max assist) did not change, and were accurate. Bill's responses were unchanged for three of the four questions on the checklist (general needs, IEP needs, and medical needs). He indicated a regression in his performance in requesting help. Carlos's responses were unchanged for two of the questions (IEP needs and medical needs) and he indicated improvement on the other two questions (general needs and asking for help). Dan's responses for three of the four questions indicated improvement in his performance in making requests, from maximum assist to sometimes (general needs, IEP needs, and medical needs). On the fourth question (ask for help) his response indicated a regression in his performance (a lot to max assist).

In addition, sustainability was used to assess the social validity of environmental arrangement in conjunction with least to most prompts as an intervention strategy.

Following completion of the study, probes were conducted to determine if students continued to request materials when completing typical classroom tasks. Probes were

conducted between two and four weeks following completion of the generalization phase. Evidence of sustainability was observed for the three students who completed the study and for whom probe data were collected. Ana's response percentage was at 67%, Bill was at 100%, and Carlos was at 83% during probe sessions. All four students initiated requests for materials at times and in locations that were in addition to the sessions established and used during the study. Students continued to initiate requests for materials during the following school year. These independent initiations in conjunction with the initiations documented during probe sessions provide evidence of sustainability for this intervention across students.

### **Discussion**

This study investigated the use of an intervention package (environmental arrangement and system of least prompts) to increase the effective initiation of requests for materials by students with physical disabilities in a school setting. The intent of the study was to decrease demonstration of learned helplessness (e.g., student waits passively for help, or makes an ineffective request by saying or signing help or pointing to the general area of the needed material) and increase correct initiation of requests for needed materials. The initiation of requests was evaluated across materials and settings.

This study met the criteria for Evidence Standards in single subject research as described by Kratochwill et al., 2010. Specifically, the independent variable (environmental arrangement coupled with system of least prompts) was systematically applied with each student. The researcher designed and implemented a multiple baseline and analyzed data to determine when phase changes should occur. This manipulation met the first criteria for Evidence Standards.

In addition, the target behavior was measured using percentage of correct initiation of requests across all phases, with interobserver agreement collected for a minimum of 33% of sessions, and calculated across phases for each student, with criteria set at 85% accuracy. These measurements and calculations met the second criteria for Evidence Standards. A minimum of three baseline conditions is required in a study using a multiple baseline design to meet Evidence Standards. This study had four baseline conditions, and therefore meets the Standards.

Evidence Standards require that a functional relation be established. For a study using a multiple baseline design, a minimum of six phases is required, each with at least five data points. This study meets the Evidence Standards for demonstrating a functional relation (see Figure 2).

The results suggest that the use of environmental arrangement coupled with the system of least prompts can be an effective intervention when teaching elementary age students with physical disabilities to initiate requests for needed materials in a variety of school settings. Three of the four students successfully initiated requests for materials following intervention. All four students demonstrated independent initiation of requests in situations that were not part of the session trials, indicating the generalization of the intervention.

### **Accuracy**

Ana reached criteria at session nine, Bill at session 12, and Carlos at session 13. All three students were able to demonstrate independent initiation across materials and settings. For two of the students (Ana and Bill) significant seizure activity occurred during the implementation of this study. In spite of increased seizure activity, increased

dosages of medications, and several trips to the hospital (for Bill) during the time period of the study, they were able to be successful following the intervention. It would appear that this intervention can be successfully implemented across a range of student characteristics, including students who are verbal and nonverbal, and with students who have additional disabilities (seizure activity), although further replication studies are needed.

The fourth student, Dan, was not able to meet criteria during intervention. Dan has diagnoses of cerebral palsy and autism. Dan exhibited a number of behaviors during the study, including controlling and attention-seeking behaviors. These behaviors were not new, and they negatively impacted his performance during this study. For example, after the first session of intervention, Dan began initiating requests for the computer keyboard independently. The computer was a very motivating material for Dan, and he was eager to have access to it. He initiated the request immediately upon noticing that the keyboard was missing. However, during trials for the other materials, he smiled, sat back, and waited through the system of least prompts until the fourth level – verbal model – was reached. At that point he would immediately complete the request for the material, smiling as he did so. During later sessions (beginning with session 15), as soon as the direction was given that would require a request in order to complete, Dan smiled, signed the first word of his request (I...) then paused, still smiling, with his hand raised in the sign for “I”, and waited until the fourth level – verbal model – when he completed the request.

Dan was observed at other times during his school day, following the intervention phase, making requests for materials using the response that had been taught to him



during the intervention. He even attempted to request going to see peers in other classrooms using the same request sequence (e.g., I want “friend’s name”). It would appear that his controlling behavior (e.g., not responding in an attempt to control his environment and achieve attention, even if it was negative attention involving a reprimand for not “showing what he knows”) interfered with his ability to reach criteria during the intervention phase of this study.

In answer to the first research question regarding the ability of students to increase effective initiation of requests for materials, the data indicate that three of the four students reached criteria using the system of least prompts coupled with environmental arrangement. Although all four students showed an increase in initiation, one of the four students (Dan) did not exhibit the desired behavior within the confines of the study. This appears to be an effective intervention for those students who do not exhibit interfering behaviors.

One factor that may influence the success of this intervention concerns the intellectual functioning of students with physical disabilities. Eligibility criteria used in the state of Georgia states that students receiving services in the Orthopedically Impaired Program may function across a range from mild intellectual disabilities to gifted intellectually. This cognitive ability makes it possible for students to discern that technique (environmental arrangement) being used to prompt their responses. For example, rather than making the correct request Carlos asked, “Did you take my folder again?”, or said, “You took it again, didn’t you?”, when given the cue for that material. It appeared that he knew we were arranging the environment by creating situations that involved missing materials, although it took him five sessions to translate that understanding into correct

initiation for the missing material. Environmental arrangement involves manipulating the environment in order to prompt targeted student behavior. In this study, the targeted behavior was effective initiation of requests for missing materials or materials that were out of reach. However, for students like Carlos, who are able to recognize the manipulation, this type of intervention may not be the most efficient when providing instruction. A search of the literature did not locate any studies which used environmental arrangement as an intervention strategy with students having normal to above normal intellectual abilities. Previously cited studies using environmental arrangement involved student participants with intellectual disabilities, sensory impairments, and autism (Charlop-Christy & Carpenter, 2000; Cohen et al., 2001; McCathren, 2000; Olive et al., 2007). Further studies are needed with environmental arrangement with students who have the cognitive ability to perceive the strategy being used.

This study extended the use of these interventions to a new population of students. Previous studies using the system of least prompts and/or environmental arrangement targeted students with intellectual disabilities (DiCarlo & Reid, 2004; Manley et al., 2008; McCathren, 2000) autism (Kasari et al., 2006; Lifter et al, 1993; Olive et al., 2007), and both intellectual and sensory disabilities (Allgood et al., 2009; Heller et al., 1996). This study targeted students with physical disabilities, and the results indicated that this intervention can be successful with this population of students, although two of the students demonstrated behaviors that challenged the delivery of the intervention. Carlos's challenge involved his cognitive ability, which allowed him to make comments on the intervention rather than correctly initiating a request, thus delaying his acquisition of the

targeted communication skill. In spite of this, Carlos was able to meet criteria in five sessions during both intervention and generalization phases.

Dan's behavior was more challenging, involving what appeared to be a power struggle with this student. Dan's resistance to performing the desired target behavior until the entire sequence of prompts was delivered prevented his acquisition of the skill of effectively initiating requests within the criteria set for this study. It is possible that an alteration to the sequence of prompts or the addition of reinforcement may have allowed Dan to reach criteria. Further studies involving students with physical disabilities and higher cognitive abilities, as well as students with challenging behaviors, are needed.

### **Generalization**

The first session in the generalization phase provided insight as to how students generalized without instruction to the new material. During the generalization phase, Ana responded with >80% accuracy during the first session. Bill and Carlos responded with 67% accuracy during the first session. The data indicated that some generalization had occurred, but further instruction was required in order to reach criteria.

This finding aligns with other studies that reported difficulty with generalization and a need for further instruction (Heller, Fredrick, Tumlin, & Brineman, 2002; Heller et al., 1996; Manley et al., 2008). It is possible that a longer intervention phase may increase a student's ability to generalize the skill of initiating requests to new materials without needing instruction. Also, the use of specific generalization strategies may have assisted with generalizing to new materials. For example, for students with higher cognitive abilities, cueing the student to use the skill with similar materials or in novel settings, or explaining to the student during intervention that this skill may be used in

other settings or with other materials, may promote generalization to new materials and novel settings ( Duhon, House, Poncy, Hastings, & McClurg, 2010; Konrad & Trela, 2007). For those students with behaviors such as noncompliance, generalization strategies such as the addition of reinforcers or the application of contingencies such as time-out may be necessary to promote generalization (Noell, Roane, VanDerHeyden, Whitmarsh & Gatti, 2000). Further studies are needed with a longer intervention phase as well as the use of strategies specifically targeting generalization.

All three students reached criteria in the generalization phase with additional instruction despite factors that are common with students with physical disabilities (Heller, 2009). The results provide the data that answers the second research question regarding generalization to new materials in the affirmative. The time it took for them to reach criteria in this phase was variable. While all three students demonstrated some level of generalization in the first session of this phase, additional instruction provided the needed support for two of the three students to reach criteria within five sessions. For the third student, a total of eight sessions were required in order for him to reach criteria. Bill experienced a sudden onset of seizures. His seizure disability had been controlled by medication since age three. However, his weight gain rendered the dosage ineffective, and he began having multiple episodes of seizure activity during this phase of the study. He was seen in the emergency room twice during this time period, and new dosages of seizure medications were instituted during this time. The seizure activity, coupled with absences related to the seizure activity and side effects related to increased medication, negatively impacted his performance during the generalization phase. In spite of these setbacks, Bill was able to meet criteria at session eight of the generalization phase. Future

studies with this population of students will need to expect disruptions to data collection based on their challenging medical and physical characteristics.

### **Generalization to Different Settings**

Probe sessions were conducted for the three students who reached criteria during the intervention and generalization phases which examined their ability to generalize the skill of initiating requests for materials to different settings. All three students were able to transfer the skill of initiating requests for materials to a new setting, which answers the third research question. Two of the three students (Bill and Carlos) were able to initiate requests at or above 80% accuracy. Ana experienced a significant increase in seizure activity during the time period between the last generalization session and the probe session which may have affected the accuracy of her responses.

It is interesting to note that all students were able to display effective initiation of request at other times and in other locations, which suggests some level of generalization. For example, Ana independently initiated a request for a calculator during math class, using the correct format. Bill requested a pencil during his journal writing time at the end of the day. Carlos requested his Monday folder independently. Dan was observed using the requesting format in a novel fashion by requesting for time with a friend in another class. Further studies are needed to examine effective means of generalization to new settings.

### **Error Analysis**

This study examined student response types when prompted to initiate request for materials. All of the students' prior requesting behaviors were evidenced during baseline and continued during the early part of the intervention. Two students (Ana and Dan)

demonstrated ineffective gestures as their predominant error type. A third student (Bill) demonstrated unrelated comments as his predominant error type, and the fourth student (Carlos) demonstrated an equal split between making no attempt to respond and making unrelated comments when prompted to initiate requests (see Tables 3-6). These students were able to move quickly to the correct initiation response, except for Dan.

Upon examining the coding of the data, it was noted that two of the students were responding differently to the stimulus, although they were both coded as “unrelated comments.” For example, Carlos seemed to recognize that he needed to initiate some sort of behavior, which may explain his shift to predominantly unrelated comments as he moved toward recognition of the correct format for initiating requests. His comments indicated that he knew that an adult had manipulated his environment, but he was not prompted to initiate a request for the needed material. Instead, his remarks were direct comments about what that adult had done in order to encourage his effective initiation of a request. On the other hand, Bill’s unrelated comments had no relevance to the activity at hand. Often, when asked to complete an activity for which he did not have the needed material, he would ask if it was time for recess, or tell about something he had done at home the previous night. This type of off-topic communication is typical of individuals with a traumatic brain injury, due to common characteristics that include impulsivity, inattention, and communication difficulties (Heller, 2009; Lê, Mozeiko, & Coelho, 2011). In both cases, the students demonstrated an inability to effectively request needed materials. Future researchers may want to code these types of responses separately.

Even though all students in this study used some form of ineffective requesting behavior prior to the study, it is interesting to note that all four students had a percentage

of passive waiting behavior, during which they made no attempt to initiate requests. The ease with which the students learned to appropriately request may be attributed to having some initiating requesting behavior, even though it was ineffective. Further studies are needed to determine the effectiveness of this intervention with students who have no initiation of requesting behaviors.

The inability of the students to advocate for their needs is attributed to their learned helplessness. Students waited passively for assistance, or made comments that did not serve to make others aware of their specific needs. Learned helplessness has been defined as a process that alters cognition and prevents the development of self-advocacy skills (Maier & Seligman, 1976). For students with physical disabilities, who are often dependent on others due to their inability to perform tasks due to their physical limitations, specific instruction is required to combat learned helplessness (Angell et al., 2010; Heller et al., 1996). It is important to begin instruction at an early age. For this reason, the participants involved in this study were elementary age students. Data collected during baseline for this study ranged from 0% to 50% of correct initiation of requests, which points to their learned helplessness. Following intervention, data collected ranged from 67% to 100% of correct initiation of requests. This study provides evidence that instruction in self-advocacy skills for elementary age students with physical disabilities in (e.g., the effective initiation of requests) can be successful in decreasing learned helplessness.

### **Self-Advocacy Questionnaire**

Overall, analysis of the student responses to the self-advocacy checklist indicated that the students were not able to accurately assess their own abilities across all types of

requesting situations. While some self-awareness of ability was evident, the students were not consistent in their ability to self-assess and report accurately. For example, Ana indicated that she improved in the area of requesting needs during IEP meetings. However, Ana did not attend her IEP meetings due to her young age, so her self-rating in this area indicates a lack of accurate self-assessment ability. Bill's self-assessment of his ability to request needed materials pre-intervention was high (he indicated he did this a lot). Yet data indicated that he correctly initiated a request for materials for only 10% of the trials during baseline. It may be that young students are not developmentally ready to self-assess. This type of questionnaire may be more suited for older students.

### **Future Considerations**

This study examined students who used ineffective gestures, unrelated comments, partial requests, or who waited passively for needed materials when asked to complete a task. Further replications of this study to determine effectiveness across students with additional physical disabilities, with different patterns of initiation errors, and across settings are needed to expand the knowledge base of self-advocacy instructional strategies among young students with physical disabilities. Also, students with physical disabilities often have additional challenges that prevent consistent school attendance (e.g., illness or injuries connected to their disabilities that result in extended absences or irregular attendance) (Heller, 2009). For example, in this study, two students who met criteria for inclusion had to be dropped prior to intervention because of frequent, extended absences as a result of their disabilities. This interfering characteristic may make it difficult for these students to participate for the entire duration of a study.



Students enrolled in this study exhibited two forms of communication: several of the students were verbal, while others used a combination of signs and gestures as their primary means of communication. There were no students using an Augmentative and Alternative Communication (AAC) device as their primary mode of communication. Two of the students did have AAC devices, but used their devices in limited areas, and not as their primary means of communication. Studies involving students who use AAC devices as their primary means of communication would be an important contribution in the area of self-advocacy, especially the initiation of communication.

Most of the students who participated in this study were served in a self-contained classroom for students with orthopedic impairments (three of four students). This allowed for tighter control of the environment and its manipulation during the study. Only one student served in the general education setting participated in this study. An important addition to this body of knowledge would be the inclusion of more students with physical disabilities who are served in the general education setting.

The results of this study add to the body of knowledge concerning the development of self-advocacy skills. Educational mandates (IDEA, NCLB) emphasize the development of self-advocacy skills for all students. Studies that target self-advocacy skills for students with disabilities have focused predominantly on students with learning disabilities or students with intellectual disabilities and the skills targeted were focused on student participation in IEP meetings. Very few studies involved students with physical disabilities and the specific self-advocacy skill of communication (initiation of requests). Previous self-advocacy skills studies which examined the ability to effectively initiate requests involving students with physical disabilities had targeted students in high

school or college (Balcazar et al., 1991; Powers et al., 1995; Taylor-Ritzler et al., 2001). No previous studies were identified that targeted elementary age students with physical disabilities and their self-advocacy skills. This study expanded the target population to include elementary age students with physical disabilities. In the current study, three of the four young students were able to increase their effective initiation of requests for materials as a result of the intervention. The combination of environmental arrangement and the system of least prompts was effective in promoting the increase of skills to new materials and to novel settings as well.

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## APPENDIXES

## APPENDIX A

## Self-advocacy Checklist

Do I....	a lot	sometimes	a little	I need someone to tell me or do this for me
Tell people about my feelings?				
Tell people about my disability?				
Tell other people what I need?				
Tell what I need at IEP meetings?				
Ask for help from others?				
Learn new things?				
Tell people about my medical needs?				

Adapted from My Future, My Plan.

## APPENDIX B

## Sample Initiation of Requests Data Collection Sheet

## Initiation of Requests – Intervention Phase

Student \_\_\_\_\_ Item Set \_\_\_ Materials \_\_\_\_\_

Date								
Trial 1 <b>backpack</b>								
Error Code								
Trial 2 <b>reading bag</b>								
Error Code								
Trial 3 <b>crayon</b>								
Error Code								
Trial 4 <b>pencil</b>								
Error Code								
Trial 5 <b>mouse</b>								
Error Code								
Trial 6 <b>mimio stylus</b>								
Error Code								

Key for Trials: I – Independent, D – Repeat Direction, IV – Indirect Verbal, M – Verbal Model

Error Code: P – Passive Waiting, IE – Ineffective Gesture, UR – Unrelated Comment, PR – Partial Request

## APPENDIX C

## Data Collection Competency Checklist

Student \_\_\_\_\_

- \_\_\_\_ 1. Can describe the environmental arrangement for a named student.
- \_\_\_\_ 2. Can list needed materials for a named student.
- \_\_\_\_ 3. Can demonstrate the cues to be used for each material and situation for  
\_\_\_\_ baseline,  
\_\_\_\_ intervention, and  
\_\_\_\_ generalization during a role play exercise.
- \_\_\_\_ 4. Can describe the specific  
\_\_\_\_ language and  
\_\_\_\_ method of communication for a named student
- \_\_\_\_ 5. Can identify correct and incorrect responses during role play situations.
- \_\_\_\_ 6. Can determine the correct prompt to use following a student response for all levels of the system of least prompts.  
\_\_\_\_ independent  
\_\_\_\_ verbal restatement  
\_\_\_\_ indirect verbal  
\_\_\_\_ verbal model
- \_\_\_\_ 7. Can complete a data collection sheet for each of the phases of the study while observing a role play situation.

APPENDIX D

Procedural Fidelity Checklist

Student Name \_\_\_\_\_ Phase \_\_\_\_\_

√ indicates step was implemented correctly  
 X indicates step was not implemented correctly

	Trial One	Trial Two	Trial Three	Trial Four	Trial Five	Trial Six
Materials Missing or out of reach						
Give Direction						
Pause						
Student Response, then move to next prompt <b>OR</b> correction prompt(Verbal Model)						
Verbal Cue						
Pause						
Student Response, then move to next prompt <b>OR</b> correction prompt(Verbal Model)						
Indirect Verbal Cue						
Pause						
Student Response, then move to correction prompt(Verbal Model) if needed						
Verbal Model						
Pause						
Response						