

Pervasive Developmental disorder and
Visual Activity Schedules

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Wally P. Kaufer

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FACULTY APPROVAL
Pervasive Developmental Disorder and
Visual Activity Schedules

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_____,'

Dr. Gordon Martinen, Faculty Advisor

_____, Date

ABSTRACT

The purpose of this project was to help the researcher discover whether the use of daily picture activity schedules would increase the amount of time middle school students with pervasive developmental disorder (PDD) would attend to tasks. The study began by recording baseline data on two students with PDD. Next, the researcher introduced daily picture schedules for each of the students and recorded data on the length of time the two students spent attending to assignments. The author then compared the averages of the baseline and post-intervention data. As a result of the picture schedule intervention, the amount of time the two subject students spend attending to tasks increased. The use of the picture schedule had a positive impact on the two student's ability to attend to assignments and transition between tasks.

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TABLE OF CONTENTS

	Page
FACULTY APPROVAL	ii
ABSTRACTiii
PREMISSION TO STOREiv
TABLE OF CONTENTS . . . . .	.v
LIST OF TABLES	viii
CHAPTER 1	1
Introduction	1
Background of the Project	1
Statement of the Problem . . . . .	.3
Purpose of the Project . . . . .	.7
Delimitations	7
Assumptions . . . . .	.8
Hypothesis . . . . .	.9
Null Hypothesis	9
Significance of the Project . . . . .	.10
Procedure . . . . .	.10
Definition of Terms . . . . .	.11
Acronyms	14

CHAPTER 2 . . . . .	.15
Review of Selected Literature	15
Introduction	15
Autism and Communication	16
Autism and Adolescence	23
Autism and Teaching and Learning	27
Summary . . . . .	.34
CHAPTER 3 . . . . .	.38
Methodology and Treatment of Data	38
Introduction	38
Methodology . . . . .	.39
Participants	40
Instruments . . . . .	.42
Design	43
Procedure . . . . .	.43
Treatment of the Data . . . . .	.44
Summary . . . . .	.44
CHAPTER 4 . . . . .	.46
Analysis of the Data . . . . .	.46
Introduction	46
Description of the Environment	47

Hypothesis	47
Null Hypothesis . . . . .	.47
Results of the study	48
Findings	52
Discussion	52
Summary . . . . .	.53
CHAPTER 5 . . . . .	.55
Summary, Conclusions and Recommendations .55	
Summary . . . . .	.55
Conclusions . . . . .	.57
Recommendations . . . . .	.58
REFERENCES	60

LIST OF TABLES

Table 1. Pre and Post intervention data . . .	50
Table 2. StatPac table for student J	51
Table 3. Distribution of t for student J . . .	52
Table 4. StatPac table for student J	53
Table 5. Distribution of t for student B . . .	54

CHAPTER 1

Introduction

Background for the Project

Effective communication has been described as essential in today's society. Washington Governor Chris Gregoire (2006) identified communication skills "as one of the critical competencies needed to achieve success in today's society" (p.6). That sentiment was shared by Dr. Terry Bergeson (2008), Superintendent of Public instruction (OSPI), who said:

Communication requires a vast repertoire of skills in intrapersonal and interpersonal processing, listening, observing, speaking, questioning, analyzing, and evaluating. Use of these processes is developmental and transfers to all areas of life: home, school, community, work, and beyond" (Dr. Terry Bergeson, 2008).

According to Grandin (2006), communication for people with autism had always been challenging, not only in expression, but reception. Grandin described the process of reception for those with autism as:

I think in pictures. Words are like a second language to me. I translate both spoken and written words into full-color movies, complete with sound, which runs like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures (p.2).

What was the importance of promoting communication with and of students with autism? When first defining Asperger's syndrome, a type of autism, Dr. Hans Asperger (1944) wrote:

We are convinced, then, that autistic people have their place in the organism of the social community. They fulfil their role well, perhaps better than anyone else could, and we are talking of people who as children had the greatest difficulties and caused untold worries to their care-giver . . . it seems that for success in science and art, a dash of autism is essential (p 23).

The authorities cited above identified the importance of communication and the role of

communication in education and society. Further, these authorities highlighted the communication challenges facing people with autism. In doing so, these individuals established the context of the present study.

Statement of the Problem

The researcher taught in a self-contained special education classroom, though having had limited experience working with students with autism. During the 2008-2009 school year, the author had two students who had been diagnosed with Pervasive Developmental Disorder (PDD), henceforth referred to as students J and B. Pervasive Developmental Disorder had been described as a segment of Autism Spectrum Disorder (ASD). Students with that disorder had significant delays in development, including communication problems such as difficulty using and understanding language; and relating to people, objects, and events.

The researcher noted several challenges with the two students. First, because of their limited ability to receive and process language, it was difficult to

communicate expectations, tasks, and assignments to them. Picture Exchange Communication System (PECS) was used by each student, in a limited capacity to communicate their needs such as hunger, thirst, and a desire to be changed. However, it was frequently unclear to the instructor as to the amount of information they comprehended.

Another challenge was that it was routinely difficult to transition the two students from one activity to another. While with other students in the class could smoothly move from task to task with little or no advance notice, students J and B would consistently resist changes in activities. In addition to limited receptive language skills, students J and B had virtually no concept of time. Consequently, providing time or advanced notice was ineffective. This situation would often result as a distraction for the entire class.

Finally, the author observed that students J and B spent very minimal time attending to activities related to their academic goals. That lack of action

was assumed to be the result of a combination of an extremely short attention span coupled with a desire to perform other activities. For example, student J preferred to watch movies with a video cassette recorder (VCR) that he could manipulate. This student would find a segment that he liked and watch it over and over by rewinding the movie. Student B wanted to divide his time by sorting and lining up objects, and sleeping. The researcher had been challenged all year to get student B to participate at all, and to keep student J on-task for more than a couple minutes. Lack of communication made the direction of students J and B difficult, causing the writer to realize the need for extended instruction, focused on acquiring and practicing skills related to their learning objectives.

Prior to the beginning of the study, the author relied on observation and general impressions of the amount of time students J and B were attending to instruction and supporting activities. To further determine actual severity of the problem and need for

change, data on students J and B was collected during two non-consecutive weeks in 2008. Data collected indicated that the average time per day devoted to learning and practicing skills was less than four minutes for student J and under two minutes for student B. The baseline data indicated that both students were spending a very small amount of their school day on productive learning activities.

In response to the data collected and analyzed, the author decided to create and implement a daily picture schedule designed to increase the amount of time students J and B were attending to instruction and supporting activities.

Phrased as a question, the problem that represented the focus of the present study was: To what extent did the use of daily picture schedules increase the amount of time students J and B attended to instruction and supporting activities?

Purpose of the Project

The author recognized that the three challenges students J and B faced were interconnected. However,

measuring communication or ease of transition was not the focus of the researcher's study. The author wanted to know if the introduction and use of daily picture schedules for students J and B would increase the amount of time they attended to assignments and tasks. The author had experienced prior success using picture schedules with higher functioning autistic students. Those students were more verbal, both in using and receiving spoken language than students J and B. The author wanted to discover whether the use of picture schedules would have a significant effect on nonverbal students.

Delimitations

This experimental research project took place over the course of a four month period beginning in November, 2008, and concluded in February, 2009. The study took place in the author's classroom at Wilson Middle School in the Yakima School District. The classroom was comprised of nine 6th - 8th grade students with moderate mental retardation or multiple disabilities. The researcher's classroom had a private

bathroom with shower facilities, laundry room with both washer and dryer, and a kitchen that included a stove with oven, dishwasher, and many small countertop appliances.

Assumptions

The researcher had been the classroom teacher of student J for thirteen months and student B's teacher for four months. Based on this experience, the researcher was satisfied in making the following assumptions:

1. Both students J and B were comfortable in the classroom setting.
2. Both students exhibited a frustration in their inability to communicate their needs and desires to those in a position to provide them.
3. Students J and B exhibited a desire for better communication.
4. The skills and tasks the researcher was expecting from the students were within their capabilities.
5. Based on experience as a veteran special education teacher, the author had knowledge of

prior successes using picture schedules with students diagnosed with ASD.

6. The researcher was confident in the assumption that baseline data collected from each student was representative of their average time involved in skills learning and practice.

Hypothesis

Students with Pervasive Developmental Disorder would increase the amount of time they attended to instruction and supporting activities. The students would increase their time with the use of a picture schedule.

Null Hypothesis

Students with Pervasive Developmental Disorder would realize no significant difference in the amount of time they attended to instruction and supporting activities with the introduction of a picture schedule. Significance was determined for $p = 0.05$, 0.01 , and 0.001 levels.

Significance of Project

The author believed that students J and B had the capacity to learn and progress. The project attempted to reduce obstacles preventing the two subject students from greater achievement. That was to be accomplished by promoting and facilitating increased communication between the teacher and students J and B. The author determined that if the project's results were positive, the students would have had increased opportunity to learn and practice skills. Additionally, the use of the picture schedule strategy could be shared with other teachers in the district with similarly disabled students. Finally, the picture schedule procedure could be transferred, or generalized to a community setting, such as daily living skills or job training.

Procedure

The researcher began by considering the major challenges facing the current students. From that resulting list, the writer made the determination to focus the present study on increasing the amount of

time students J and B attended to instruction and supporting activities. Next, the researcher and participating in classroom paraprofessionals collected baseline data detailing time spent on school work by students J and B. The researcher then introduced a daily picture schedule to each of the students, and collected data related to instruction and supporting activities time for each student over the course of a month. Finally, the researcher analyzed the data to formulate related generalizations, conclusions, and recommendations.

Definition of Terms

Significant terms used in the context of the present study were defined as follows,

Asperger's Syndrome. Asperger's syndrome was an autistic disorder most notable for the often great discrepancy between the intellectual and social abilities of those who have it. Asperger syndrome was a pervasive developmental disorder that are characterized by an inability to understand how to interact socially

autism. Autism was a spectrum of neuropsychiatric disorders characterized by deficits in social interaction and communication, and unusual and repetitive behavior. Some, but not all, people with autism are non-verbal.

autism spectrum disorder. Autism Spectrum Disorders, sometimes called Pervasive Developmental Disorders (PDD), were a range of neurological disorders that most markedly involve some degree of difficulty with communication and interpersonal relationships, as well as obsessions and repetitive behaviors. As the term spectrum indicated, there can be a wide range of effects.

experimental research. Research in which at least one independent variable was manipulated, other relevant variables were controlled, and the effect on one or more dependent variables was observed.

functional communication training. Investigating a general strategy for determining the reasons underlying behavior and then teaching different ways to achieve the desired outcome.

pervasive developmental disorder. Pervasive developmental disorders (PDD) were thought to be genetically based, with no evidence linking them to environmental factors; their incidence in the general population was estimated at 1%. One of the PDDs was autism, a condition characterized by severely impaired social interaction, communication, and abstract thought, and often manifested by stereotyped and repetitive behavior patterns. Many children who were diagnosed with PDD today would have been labeled psychotic or schizophrenic in the past.

picture exchange communication system. The Picture Exchange Communication System (PECS) was a visually presented method for teaching autistic children to comprehend language. The PECS method consisted of six sequential and systematic phases, each of which breaks the task of language acquisition into small steps. Each phase was presented in order. As children mastered each phase, they advanced to the next appropriate phase.

Acronyms

ASD. Autism Spectrum Disorder

FCT. Functional Communication Training

OSPI. Office of Superintendent of Public
Instruction

PECS. Picture Exchange Communication System

PDD. Pervasive Developmental Disorder

VCR. Video Cassette Recorder

CHAPTER 2

Review of Selected Literature

Introduction

The researcher identified the problem as the minimal amount of time two students with autism spectrum disorder (ASD) were attending to instruction and supporting activities. The author wanted to know if the use of a picture schedule would increase the amount of time these two students spent on learning and practicing skills.

One of the subjects the writer researched was communication and autism, which included the need for communication, the challenges in communicating for autistic children, and intervention strategies for successful communication. Another area of research focused on autism in middle school students. Finally, the researcher reviewed literature concerning teaching and learning with autistic students, which included use of visual supports, picture schedules, and working towards greater independence for the

students. The research aided the author in supporting problem and creating the experimental project.

Communication and Autism

According to the Diagnostic and Statistical Manuel on Mental disorders (DSM-IV), published by the American Psychiatric Association, "Language and communication are major areas of concern for children with autism" (2000).

In our society, "the consequences for children and adults who cannot communicate are very severe" (Bondy & Frost, 2002, p.22). These consequences included the inability to communicate wants, to communicate "no", to engage in social interaction, as well as the inability to understand others. A child unable to communicate "may display aggression, tantrums, or self-injury associated with their frustration over not being able to get what they want" (Bondy & Frost, 2002, p.22). Additionally, children unable to communicate "no, enough", or "I need a break" often "struck out at both others and the environments a way of forcing escape from a difficult

or unwanted task" (Bondy & Frost, 2002, p.22). Those tasks often included activities seen by the subjects as "difficult, boring, too long in duration, not associated with a equitable amount of positive feedback, or in environments that were too noisy, crowded, chaotic, hot/cold, etc." (Bondy & Frost, 2002, p.32).

One of the areas of concern found in the readings was that behaviors, especially self-injurious actions were seen to occur when a child was unable to communicate feelings of sickness or pain (Bondy & Frost, 2002, p.35). Unlike escape or avoidance, identifying the cause of the behaviors in those incidents proved to be particularly difficult. That difficulty resulted in the increased student and development of Functional Communication Training (FCT). That referred to a two-part intervention that is focused on " investigating...the reasons underlying behavior and then teaching different ways to achieve the desired outcome" (Bondy & Frost, 2002, p.35). Implementation of FCT aided children in communicating

more specific concerns, as well as helping the teacher or caregiver to more accurately discriminate between a need for assistance, an act of avoidance or escape, physical pain and discomfort, or having some other need met.

Bondy & Frost (2002) added that "most of what happens between friends involves social interactions" (p.23), and the consequence of the inability to engage in social conversation was that those children "may experience significant difficulties in developing friendships" (Bondy & Frost, 2002, p.23).

Finally, it was noted that life could be incomprehensible, confusing, and scary for children who lacked the ability to comprehend. For those children, life appeared to be random, chaotic, and disorganized. Without the ability to comprehend:

they may not be able to understand what is going to happen next, what they are expected to do, what they will get for doing something, where they are about to go, and with whom they are about to work with (Bondy & Frost, 2002, p.23).

The researcher found the pervasiveness of communication challenges for children with autism spectrum disorder (ASD) to be significant. It was estimated that "one third to one half of all children who have ASD do not have functional speech to communicate (National Research Council, in Spencer, Petersen, & Gillam, 2008). Further, Spencer, et al. stated that "when children with ASD do not readily acquire speech, training them to use augmentative and alternative communication (AAC) is an appropriate option" (p.40). An augmentative and alternative communication strategy was viewed as one of the most widely-used interventions for children with autism. According to the research, AAC included both aided and unaided components. Aided components included "picture communication symbols, line drawings, Blissymbols, and tangible objects, while examples of unaided symbols incorporated manual signs, gestures, and finger spelling (ASHA, in Spencer, et al, 2008). The research identified disadvantages to both aided and unaided symbols. Aided systems were "Sometimes cumbersome

because of their technological complexity or the amount of materials necessary to maintain them” (Spencer, et al., 2008). Additionally, unaided systems could be challenging for students with limited motor skills. According to Spencer, “adequate motor skills appear to be a prerequisite to successful acquisition of sign language” (2008).

Among the most prevalent interventions were sign language, electronic communication aids, and the picture exchange communication system (PECS). Students started with a small number of pictures or symbols, and then graduated to having many choices. These communication modifications were found to “increase the communicative interactions of children with autism and enable them to exercise control over their environments” (Charlop-Christy, in Marckel, Neef, & Ferreri, 2006). The research also found that as the child’s repertoire increased, the number of pictures could get too large to remain efficient in communication. The effect of this unmanageable number of pictures was that it then became necessary for the

student to develop and use problem-solving skills to create meaning from the resources available. An example of that application would be to "identify alternative symbols that could be used to generate a reinforceable response when a single specific symbol for a stimulus is not readily available" (Marckel et al., 2006).

Additional reading reported the positive outcomes of PECS on a study of a 6-year-old girl with autism. The PECS was used in both her home and school environment. The results of the study reported that the subject showed "increases in spontaneous language (i.e. requests and comments) including use of the icons and verbalization across those settings in which PECS was implemented" (Kravits, Kamps, Kemmerer, & Potucek, 2002, p.68).

The literature highlighted a very important and possibly overlooked aspect of the use of picture schedules in communication. That was that learning to follow a picture schedule often led to "intolerance for changes in that schedule" (Bondy & Frost, 2002,

p.131), and created new behavior concerns. Bondy & Frost continued by stressing the importance of teaching "tolerance as [an] overall strategy for all students using a picture schedules rather than waiting for the emergence of new behavior problems in students" (2002).

An effective strategy identified in teaching tolerance was the use of "good" surprises. For example, introducing a "surprise" picture icon, such as a colorful tile, a wrapped present, or a question mark to indicate an unknown variance in the schedule. Initially these surprises would involve "lots of rewarding activities and treats...often were replacing work time or other less fun activities". (Bondy & Frost, 2002, p.131) Over time, the teacher would have these activities metamorphosed into more work-related tasks, though continuing to reward students for their participation. Bondy & Frost (2002) concluded by underlying the importance of the ability to adapt and be flexible by stating that "we all know that unexpected changes are a part of life . . ." (p. 131).

Autism and Adolescence

The author found several instances that caused concern regarding communication and functional growth of adolescents with autism. These included the development and manifestation of new disorders or behaviors, as well as set-backs in behaviors that coincided with the subject's pubertal period. Finally, there was data found that indicated that many children with autism reached a communications plateau during adolescence, suggesting the urgency, or importance of establishing communication methods prior to, or during this period.

An article by Stromer, et al, (2006) highlighted the growing challenges for adolescent individuals with autism, as well as their families. Specifically, as "preparation must be made for the transition to adulthood" (Seltzer, et al, p. 565). Several areas of concern for this transition were identified, including social and communicative skills. In addition to this challenge was the manifestation of symptoms of ASD individuals during this sensitive and key period.

Primarily, that the “processes of maturation and development interact with the manifestation of the core symptoms of autism that affect acquisition of skills: (Burack, Chapman, Yirmira, & Zelazo, 2001, in Seltzer, et al, p. 566).

Reported by Billstedt, Gillberg, and Gillberg (2005), were the results of a “long-term epidemiological perspective on the longitudinal natural outcome of autism” (p.352). One significant piece of data reported that forty three percent of the subjects studied developed epilepsy or experienced an epileptic seizure before the age of twenty. This caused disruptions in the individual’s daily life as well as a consistent schedule for learning. During that same life period, twenty three percent developed “substantial” tics, and fifty percent began or continued to engage in moderate to severe self-injurious behaviors (Billstedt et al., 2005). Additionally, Billstedt et al. (2005) noted that thirty three percent developed symptoms that were considered to be very hyperactive, and forty two

percent "exhibited either extreme violent behavior, or were violent often enough or severely enough to cause considerable concern" (p. 356).

Billstedt et al. (2005) concluded their findings by reporting that seventeen percent of their subjects had clear set-backs during puberty, many of whom "never really recovered" (p.357). That study concluded that "the presence of some communicative skills prior to adolescence correlated with a relatively somewhat better outcome" (p.358).

A 2005 study by Sigman and McGovern focused on the continuation of communication growth from "the mid-school period to the adolescence and adulthood periods". (p. 16). One skill they noted required children's ability to symbolize, or understand "that one thing can stand for another" (p. 16). For example, a picture of a toy could represent the toy itself. Sigman and McGovern (2005) further noted that many of the lower-functioning subjects appeared to reach a communication plateau and "did not improve at all after the adolescent period" (p.22). The study and

subsequent findings by Sigman and McGovern recommended specialized intervention to continue language gains through young adulthood.

In her book *Thinking in Pictures: My Life with Autism (1996)*, Temple Grandin recalled the fear and anxiety during her adolescent period:

At puberty, fear became my main emotion. When the hormones hit, my life revolved around trying to avoid a fear-inducing panic attack. Teasing from other kids was very painful, and I responded with anger. I eventually learned to control my anger, but I was afraid to walk across the parking lot because I was afraid someone would call me a name. Any change in my school schedule caused intense anxiety and fear of a panic attack. (p.90)

Ms. Grandin (1996) cited her communication challenges as playing a significant role in the anxiety of her adolescence "I believe that

autism . . . leaves an otherwise relatively normal body and mind unable to express themselves with the depth that they would otherwise be capable of". (p.91)

Teaching and Learning with Autism

There are many sources that advocated the use of visual supports as an adaptation for teaching students with autism. Those included pictures and photos, checklists, and social stories, as well as activity schedules. According to Marion (2008), "for many, auditory information is very challenging to process, and a multi-sensory approach is most effective" (p. 281). Marion continued by highlighting "the importance of using visual supports when teaching people with autism" (2008). In the reading, the researcher found many instances where incorporating visuals into teaching methods was advocated for, as well as strategies designed to fade those supports.

As stated by Prelock (2007), "students must be given equal opportunity to participate in academic and extracurricular activities that require sufficient communication" (p.193).

In the review of the literature, there was found examples of the current experimental research model having been used as early as kindergarten. In one example, using vertical Velcro strips "the visual cues on their schedules tell students what's next in their school day" (Campbell, 2008, p. 16). As with the researcher's model, "they (students) pull off the top picture and place it in the tub at the bottom of their schedule, signaling the start of another activity" (Campbell, 2008, p. 17). In that instance, the pictures referred to a color-coded area of the classroom where specific skills were taught in a private setting.

The literature documented successes using a variety of picture schedule formats. According to the review of the literature, "activity schedules can be an effective way to teach students to manage their work, play, and skill-building activities independently" (Stromer, Kimball, Kinney, Taylor, 2006, p. 44). With a format that differed from the Velcro strip described previously, many found

achievement using a notebook. With the use of a 3-ring binder, educators implemented a similar strategy, using picture pages for scheduling prompts. Those notebooks had the rearrangement capabilities of Velcro, with the additional benefit of larger, more easily manipulated pictures. This was especially important for students still acquiring fine motor skills. Stromer et al. stated that "notebook activity schedules have been used to promote independent task initiation and completion and reduce undesirable behaviors around transition" (as cited in Schmit, Alper, Raschke, Ryndak, 2000, p. 12). That view was further supported by Stromer et al.: "in practice, the use of daily activity schedules and self-management methods involve teaching children to make choices" (2006, p. 44), as well as "teaching children to choose among activities themselves or among reinforcers available for completing a series of scheduled activities may both facilitate learning and curtail problem behaviors (Mason, McGee, Farmer-Dougan, & Risley, 1989, p.27).

With the regular use of picture schedules in school, it was found to be a skill that could help students become more independent in their daily lives. This resulted in more opportunities and freedom for the student's family. According to the literature:

Teaching individuals to use a schedule gives them the ability to be more independent. Schedules enable them to understand their world, organize their thinking, and sequence their lives. By showing them a change in their schedule visually, we are helping the individual to process the change at a basic level so that they are able to cope with it (Krumins, 2008, p. 7).

Another example of using pictures in meaningful communication was the concept described as augmentative alternative communication (AAC). This was a concept that included:

aided (use of objects, symbols, pictures, words, etc.) . . . and unaided (manual signs, gestures, vocalizations) systems with varied technology from none (child points at a picture) to low (child

pushes a switch that says a word or short phrase) to high (computer system with sophisticated voice output generating hundreds of messages) (Prelock, 2007, p. 64).

The role of AAC was to “enhance rather than replace existing functional language, as this was important when families and teams were considering ways to support the communication success of children with ASD who had limited functional communication” (Prelock, 2007). Examples that were offered to facilitate “receptive language and expressive communication” (Prelock, 2007, p. 64) included: activity schedules, transition boards, activity boards, and voice output communication aids.

The use of picture schedules was found to incorporate the concepts of visual cues and graphic organizers. Visual cues were defined as physical representations of content with concrete characteristics that can enhance comprehension (Miranda & Erikson, in Hart and Whalon, 2008, p. 16). Additionally, “Graphic organizers are visual supports

that supply concrete depictions of key ideas . . . [and] emphasize essential concepts and facts as well as the relationships between them (Smith, Miles, & Adreon, in Hart & Whalon, 2008, p. 66). When incorporated in activity schedules, graphic organizers were visual supports that assisted the student in sustained focus to their task, simplified expectations, and promoted involvement. As noted by Hart & Whalon (2008), "acting-out behaviors of children with ASD frequently may be responses to academic and curricular challenges in the classroom setting" (p.119). As students learned to apply an activity schedule, it "increases their level of independence, thereby decreasing the need for continuous teacher verbal prompting (Hall, McClannahan, & Krantz, in Hart & Whalon, 2008, p. 19). This was further supported by Bondy & Frost (2002) who wrote that ". . . children with autism may have fewer tantrums and other outbursts once they better understand the expectations for their time at school and home" (p.129).

Teaching the fundamental skill of instruction-following was outlined by Bondy & Frost (2002). The initial goal was to show the students connection between an item and a representation of that item. For example, showing the child a picture of a toy and having them select the actual toy, was a strategy called "matching to sample".(p.124) Using this picture-to-object activity gave students an understanding that they could use a corresponding picture to reference an actual item. The readings noted that a child that had already been introduced to PECS may not need that picture-to-object instruction, for students "may learn picture-to-object correspondence in the course of learning to communicate with PECS" (Bondy & Frost, 2002, p.125).

The author found that both adolescents and adults need to "build on their strengths and use their interests" (Grandin, 1996, p. 78). Children with autism often got fixations that could be turned into teaching tools. For example, if someone had a fascination with horses, lessons and curriculum for

math, science, history, and language arts could be designed around the student's intense interest of horses. Additionally, picture representations of a student's interests would carry more meaning than pictures of other objects for instructional purposes.

Summary

The research resulted in highlighting several issues relating to the challenges and frustrations of children with autism and their ability to communicate. The data supported the researcher's study in stressing the importance of building language and communication skills for children with autism. The publishings pointed out that the inability to communicate not only prevented social interaction, but caused frustration that resulted in undesirable behaviors that included aggression, tantrums, and acts of self-injury. Those behaviors were seen as actions that not only further isolated students with autism, but hampered successful learning in themselves and others. The research showed the importance of children with autism having access to alternative forms of communication, including ASL,

electronic devices, or a picture and symbol communication system

In addition to the frustration brought about by the inability to communicate, the literature underscored the effects on an autistic child on the inability to comprehend. These effects included confusion, not able to anticipate upcoming events and activities, life appearing to be random and chaotic, and incapacity to understand expectations. Since at least one in three children with autism do not have functional speech, the researcher found the importance in making augmentative and alternative communication strategies available to these students. Communication was viewed as both important to be understood as well as to be able to comprehend.

One key component of both communicating with, and teaching children with autism was the implementation and use of picture schedules. The benefits included easier transitioning for the students from one activity to another, less stress over necessary changes in a routine, and a higher understanding of

expectations. Furthermore, activity schedules promoted self-management and students were seen to be developing more independence in their daily lives. Finally, employing graphic or picture schedules seemed to curtail behavior problems, thereby facilitating learning for both the students and their peers.

The researcher found that the adolescent period could be particularly challenging for individuals with autism. Concurrent with the onset of puberty, children with autism experienced set-backs in communication that included:

1. Manifestation of new disorders or behaviors.
2. Reemergence and increase in past behaviors.
3. Regression in level or ability to communicate.
4. Reaching a plateau in communication from which progress appeared to cease.

In addition to communication set-backs, adolescents with autism experienced a higher level of fear and anxiety than their non-autistic peers. Those feelings were brought about by the common teenage anxieties of not fitting in, being teased, and not

being understood. Changes in routine or schedule, such as moving to a middle school, could also be the cause of a fear-induced panic attack. The research showed the importance and urgency of learning communication strategies prior to and during the adolescent period.

The literature that addressed teaching and learning echoed a central message - the importance of using visual supports when teaching children with autism. Examples of those supports included pictures, photos, checklists, and social stories as well as daily activity picture schedules. Regardless of the format, it was pointed out that picture schedules aided autistic students in managing their work, play and skill-building activities. Visual schedules were found to facilitate choice-making and promote independent task initiation and completion, as well as decreasing undesirable behaviors during transition times. The author found the literature on daily activity picture schedules especially noteworthy, as that was the basis for his study.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The author taught in a self-contained special education classroom. The students of the author had a variety of disabilities, including two students, J and B, with Pervasive Developmental Disorder (PDD). This condition was considered a part of the Autism Spectrum Disorders (ASD). The researcher's concern was the limited amount of time these two students spent focused to a task. Although the schedule of activities remained fairly routine and predictable day to day, students had no visual prompts to help them "see" what they were currently doing, what to expect next, or where they were in relation to other significant activities daily "landmarks" (i.e. lunch, PE, free time, going home).

The author theorized that if these two students were able to visually see where they were on the school day continuum; what to expect next and where that activity fit into their day, that knowledge would

have an effect on the amount of time those students attended to activities related to the learning and practicing of skills. The author was interested in whether the amount of on-task time for the students with PDD would increase with the use of a daily picture schedule.

Methodology

The author wanted both students J and B to benefit from this project, and chose a modified version of a single subject experimental design. For this model, the researcher used baseline data as the control group prior to the application of the intervention. The intervention or independent variable was the introduction and use of a daily visual schedule, utilizing pictures corresponding to activities and tasks. Data were collected twice daily in the form of number of minutes each of the students J and B were on task and working. The dependent variable was the change in number of minutes from the baseline data collected to the intervention data gathered.

Participants

The researcher taught in a self-contained special education classroom at Wilson Middle School in the Yakima School District. This program was for students with moderate mental retardation and PDD, as well as students with physical impairments and multiple disabilities. The year of the study was the 2008-2009 school year, and was the author's second year in that position.

At the beginning of the year, as well as at the time of this project, there were nine students in the class - five males and four females. The breakdown by grade was: four sixth-graders, three seventh-graders, and two eighth-graders. Student ages ranged from eleven to fourteen. Disabilities in the classroom included mental retardation, hearing impairment, Pervasive Developmental Disorder, Cerebral Palsy, Smith-Magenis Syndrome, and Tetralogy of Fallot. Three of the students from the researcher's classroom were in wheelchairs and one used a walker. Those three students required assistance feeding and toileting.

Assisting the researcher were two full-time paraprofessionals, and a 1:1 paraprofessional, dedicated to a single student.

The two students this study focused on were both male. Referred to previously as students J and B, each student had a diagnosis of Pervasive Developmental Disorder, which was a component of ASD. Student J was thirteen years old and a seventh-grader. That was the second year in the author's classroom. Student B was an eleven year old with sixth-grade status. He had been a student of the researcher for four months. Both students were non-verbal. Student J used a Picture Exchange Communication System (PECS) in a limited capacity for communication. Student B was familiar with PECS, but was resistant to use it.

At the commencement of the study, both students J and B spent a minimal amount of time performing any type of skills-related activity. Student J preferred to watch videos and eat while student B slept much of the day. His mother had reported that he had very

irregular sleep patterns and often had not slept prior to school.

Instruments

A modified experimental design model was used for this study. Quantitative data was collected daily using the researcher or his paraprofessional assistants observation. While the student was attending to their task or assignment, the number of minutes was recorded for each session. Attending to task was defined as the student being engaged in an activity initiated by the researcher or an adult assistant. The data excluded the activities the subject students normally chose to engage in, such as watching videos, sleeping, pacing, etc.

To achieve a higher level of validity, there was a specific adult assigned to each student for both the morning and afternoon sessions. This practice was to offer the subjects regularity in routine. In addition, data collection resulted in a higher degree of consistency, as the same criteria was used for each data gathering session.

Design

For the study, the researcher used a simple AB design. This design consisted of two phases: the A, or baseline data collection phase, and the B, or intervention data collection phase. It was during the B phase that the independent variable (daily picture schedule) was introduced.

Procedure

The study began by collecting baseline data on each student for two weeks. Given that consistency and routine were important for each of the subject's success, each student was assigned two specific sessions during the day when they were requested to work. The schedule incorporated one morning and one afternoon session. Session times during the study would remain as constant as possible. Total time each subject worked per session was recorded.

After baseline data was collected, the students were introduced to daily picture schedules. Tasks were specific (i.e. counting objects, not math). Rather than clip-art or other image representations, actual photos

of the tasks were used almost exclusively. In addition to academic tasks, those pictures represented time-referenced activities including lunch, physical education, elective class, and going home. The schedule also included a selection of each student's preferred free-time activities, such as watching videos, taking a nap, going for a walk, or having a snack. The pictures were arranged vertically on a single tag board strip, adhered by Velcro.

Treatment of Data

At the conclusion of the study, the resulting data was examined using an independent t-test. The data were then shown on individual tables. The charts reflected baseline and post-intervention data. Data were averaged to compare baseline and post-intervention results.

Summary

Out of a class of ten students, the researcher focused the study on two students, both of whom had a diagnosis of Pervasive Developmental Disorder. The author wanted to know if the amount of on-task time

for the students with PDD would increase with the use of a daily picture schedule.

Using a modified version of a single subject experimental design, the researcher first collected baseline data for each student on the number of minutes each was attending to activities related to their educational objectives. Next, the intervention of a daily picture schedule was introduced to the students. Specific morning and afternoon sessions were assigned and kept consistent. Data were again collected on the number of minutes each student was attending to academic activities. This data were shown (Table 1) and averaged for comparison.

CHAPTER 4

Analysis of the Data

Introduction

The researcher taught in a self-contained special education classroom, though having had limited experience working with students with autism. During the 2008-2009 school year, the author had two students who had been diagnosed with Pervasive Developmental Disorder (PDD), an element of autism spectrum disorder.

The researcher noted several challenges with the two students. Those challenges included difficulty to communicate expectations, tasks, and assignments to them, habitual difficulty in transitioning from one activity to another, and the minimal amount of time the two students spent attending to activities related to their academic goals. The author wanted to know if the use of daily picture schedules would increase the amount of time the two students attended to instruction and supporting activities.

Description of the Environment

This experimental research project took place over the course of a four month period beginning in November, 2008, and concluded in February, 2009. The study took place in the author's classroom at Wilson Middle School in the Yakima School District. The classroom was comprised of 6th - 8th grade students with moderate mental retardation or multiple disabilities.

Hypothesis

The use of picture schedules would have a positive impact on non-verbal students. Students with Pervasive Developmental Disorder would increase the amount of time they attended to instruction and supporting activities with the use of a picture schedule.

Null Hypothesis

Students with Pervasive Developmental Disorder would realize no significant difference in the amount

of time they attended to instruction and supporting activities with the introduction of a picture schedule. Significance was determined for $p = 0.05$., 0.01, and 0.001 levels.

Results of the Study

The researcher began by considering the major challenges facing his current students. From that resulting list, the writer made the determination to focus the present study on increasing the amount of time students J and B attended to instruction and supporting activities. Next, the researcher and his participating classroom paraprofessionals collected baseline data detailing time spent on school work by students J and B. Baseline data were collected in a five-day consecutive period in November, 2008, and another five-day consecutive period in December, 2008.

Specific morning and afternoon times were designated for each student. The researcher and his assistants used identical systems for recording data. To differentiate between sleeping and refusal to work, an S was used for sleeping, a 0 for refusal to work.

The author determined that since sleeping time was to be part of the daily picture schedule, it would be important to include that data in the findings.

The author found that student J worked an average of two minutes in the morning and 1.8 minutes in the afternoon. Furthermore, it was noted that student B worked an average of one minute in the morning and .8 minutes in the afternoon. The researcher was confident that the results represented typical behavior for the two students. The researcher then introduced a daily picture schedule to each of the students, and collected data related to instruction and supporting activities time for each student over the course of a month. Post-intervention data was collected in twenty consecutive school days in February of 2009. During that period, both subject students experienced absence days that were ultimately not included in the findings.

Table 1

Pre and Post intervention data

<u>Student J</u>		<u>Student B</u>	
Pre	Post	Pre	Post
AM	AM	AM	AM
0	3	1	0
3	2	0	2
2	4	2	2
3	7	S	Ab
0	0	2	2
2	4	2	1
2	4	3	3
0	7	3	2
4	2	3	3
4	6	4	3
PM	4	PM	S
0	Ab	S	Ab
1	Ab	S	S
1	Ab	2	Ab
3	1	0	2
1	3	2	2
0	5	0	S
0	2	S	6
1	5	1	S
2	X	2	X
1	PM	1	PM
1.9	3	.9	S
	0		1
	3		2
	3		Ab
	4		2
	2		0
	2		1
	3		2
	5		S
	1		3
	4		S
	Ab		Ab
	Ab		2
	Ab		Ab
	0		3
	6		4
	6		3
	5		2
	5		3
	X		X
	3.36		1.75

Note: Data is expressed in minutes worked. S=Sleeping Ab= Absent

To determine significance, the combined average for the am and pm baseline scores for each student were compared with the combined average am and pm post-intervention scores for each student using an independent t test.

Table 2

StatPak Table for Student J

Statistic	Value
Number of scores in X	29
Sum of scores in X	111
Mean of X	3.83
Number of scores in Y	14
Sum of scores in Y	30
Mean of Y	2.14
t-Value	3.42
Degrees of freedom	41

Table 3

Distribution of t for student J

df	p		
	.05	.01	.001
41	2.00	2.66	3.46

The researcher found significance at .05 and .01, and no significance at .001. The null hypothesis was rejected at .05 and .01, and accepted at .001. The researcher found support for the hypothesis at .05 and .01, and no support for the hypothesis at .001.

Table 4

StatPak Table for student B

Statistic	Value
Number of scores in X	23
Sum of scores in X	56
Mean of X	2.43
Number of scores in Y	13
Sum of scores in Y	28
Mean of Y	2.15
t-Value	.79
Degrees of freedom	34

Table 5

Distribution of t for student B

df	p		
	.05	.01	.001
34	2.02	2.70	3.55

The researcher found no significance at .05 and .01, or .001. The null hypothesis was accepted at .05, .01, and .001. The researcher found no support for the hypothesis at .05 and .01, and .001.

Findings

In the review of the data, the author found a significant increase in the amount of time the two subjects spent attending to assigned tasks. Subject J went from 1.9 minutes pre-intervention to 3.66 minutes post-intervention. Subject B went from .9 minutes pre-intervention to 1.75 minutes post-intervention.

Discussion

The findings of the study were anticipated by the author. The majority of the literature had reported positive results from the use of picture activity

schedules. Those results included increased productivity, smoother transition between tasks, and a decrease in student frustration, which often led to undesired behaviors. The research literature recommended the use of a picture communication system in several formats for both expressive and receptive communication of children with autism spectrum disorder.

In repeated studies, the literature reported repeated successes with non-verbal students using a daily picture schedule. Those students were better able to understand what was expected of them, as well as able to anticipate transition in activities and changes in their routine. The findings of the researcher were consistent with the review of literature.

Summary

The results of the study were consistent with both the literature and the expectations of the researcher. However, the author noted the presence of

uncontrollable variables that may have affected the data.

The most significant challenge to reliability the researcher identified was that both of the subject students had non-school personal variables that had the ability to skew the study. Student B had such irregular sleep patterns that many days he would come to school with very little sleep. Consequently he was exhausted and would end up sleeping a good portion of the day. Both students J & B could be set off by unavoidable changes in their morning routines or by an event that took place from one day to another. Both of those situations could possibly impact the reliability of the data. To compensate for this, two points have been considered. First, that the presence of those variables was likely to have been reflected in the baseline data as well. Given the probability that those variables were always present, the author was confident that he was still able to collect comparable data. Furthermore, as data were collected daily over

time, a trend would emerge despite occasional inconsistencies.

CHAPTER 5

Summary, conclusion, and Recommendations

Introduction

The purpose of the research was to discover whether the use of picture schedules would have a significant effect on nonverbal students. The author used an AB experimental design model for his research.

Summary

During the 2008-2009 school year, the author had two students who had been diagnosed with Pervasive Developmental Disorder (PDD), an element of autism spectrum disorder. Those students included an eleven year old sixth grader and a fourteen year old seventh grader. The researcher noted several challenges with the two students. Those challenges included difficulty to communicate expectations, tasks, and assignments to them, habitual difficulty in transitioning from one activity to another, and the minimal amount of time the two students spent attending to activities related to their academic goals.

The researcher began by collecting baseline data on the amount of time two subject students attended to requested tasks. Next, the researcher applied an intervention. The subjects were introduced to a daily picture activity schedule. Data continued to be taken with the use of the picture schedules. Finally, the baseline data were compared to the post-intervention data and examined for significance.

The researcher reviewed literature concerning communication, teaching and learning, and the adolescent period of children with autism spectrum disorder. The research literature recommended the use of a picture communication system for both expressive and receptive communication of children with ASD. Additionally, the research suggested that using a picture schedule would increase productivity and reduce undesirable behaviors.

The literature also indicated that the adolescent period for children with ASD was often decisive in the level of communication they would retain as they transitioned to adulthood.

The author hypothesized that the use of picture schedules would have a positive impact on non-verbal students. Students with Pervasive Developmental Disorder would increase the amount of time they attended to instruction and supporting activities with the use of a picture schedule. The researcher found support for the hypothesis at .05 and .01, and no support for the hypothesis at .001.

This experimental research project took place over the course of a four month period beginning in November, 2008, and concluded in February, 2009. The study took place in the author's classroom at Wilson Middle School in the Yakima School District. The results of the study were consistent with both the data of the literature and the expectations of the researcher.

Conclusion

The outcome of the study was consistent with the review of the literature. The author determined that his experiment had been effective, despite the

presence of uncontrollable variables and the possibility of reliability issues and inconsistencies.

The researcher concluded that picture activity schedules and a picture communication system were useful when working with students with ASD. Those adaptations enabled a higher level of expressive and receptive communication between the subjects and the teacher. Additionally, both an increase in attending to tasks and a decline in undesirable behaviors were realized. Finally, the researcher found that the students had an easier time transitioning between activities and adapting to changes in their routine due to a better understanding of expectations.

Recommendations

My primary recommendation is that any teacher or parent who has a child with an autism spectrum disorder should use a picture activity schedule as part of a picture communication system. The researcher believes that the child benefits in several ways including the increased ability to be understood, comprehend, change and anticipate activities, adapt to

deviations in routine, and become more independent. And this study did not include them, the researcher think it would be useful to any non-verbal child as part of an overall communication system.

The researcher would also recommend investigating different formats for picture schedules that consider a child's level of motor skills and acuity of vision. The format the researcher used was two-inch pictures with Velcro that were placed on a tag board strip. For students with less ability to control small objects, a three-ring binder with larger pictures would be easier to manipulate as well as be less likely to get lost or destroyed.

Finally, as picture representations are effective to some individuals, the researcher would advise the use of actual photographs whenever possible. Photos are less abstract representations of places or activities, and will be more meaningful to students, especially those with an autism spectrum disorder. Rather than seeing a clipart of a basketball hoop to represent going to PE, a photo of the hoop in the gym

would be easier for a student to make the connection.
Children with ASD are more likely to recognize and
respond to a genuine photo of an object or activity.

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Baseline data

Day	J / am	J / pm	B / am	B / pm
1	0	0	1	S
2	3	1	0	S
3	2	1	2	2
4	3	3	S	0
5	0	1	2	2
6	2	0	2	0
7	2	0	3	S
8	0	1	3	1
9	4	2	3	2
10	4	1	4	1
Average	2	1.8	1	.8

Post intervention data

day	J / am	J / pm	B / am	B / pm
1	3	3	0	S
2	2	0	2	1
3	4	3	2	2
4	7	3	1	0
5	0	4	2	2
6	4	2	1	0
7	4	2	3	1
8	7	3	2	2
9	2	5	3	S
10	6	1	3	3
11	4	4	S	S
12	Ab	Ab	1	2
13	Ab	Ab	S	2
14	Ab	Ab	S	1
15	1	0	2	3
16	3	6	2	4
17	5	6	S	3
18	2	5	6	2
19	5	5	S	3
20	X	X	X	X
	3.68	3.25	1.75	1.75