Understanding and Supporting the Role of Distinct Caregivers of Children with Special Needs, Behavior Problems and/or placed on the Autism Spectrum, enrolled in an Alternative School Placement.

Shruti Kataria
Senior Honors Thesis, Class of 2012
Dietrich College of Humanities and Social Sciences

Executive Summary

Carnegie Mellon University's UbiComp lab in the Human-Computer Interaction Institute is one of the nine institutions involved in a five-year grant from the National Science Foundation's Expeditions in Computing Program.

The title of the project is Computational Behavioral Science: Modeling, Analysis, and Visualization of Social and Communicative Behavior.
Goals of the project, as given by Georgia Tech, the lead institution, are:
1. Catalyze the development of Computational Behavioral Science, a new scientific discipline which draws equally from computer science and psychology in order to transform the study of human behavior

2. Create Behavior Imaging (BI) technology for modeling, analyzing, and visualizing social and communicative behavior

3. Apply BI technology to support the diagnosis and treatment of Autism, and other behavioral an developmental disorders
(refer to: http://www.cbs.gatech.edu/)

This thesis report is a summary of a two semester project under Dietrich College of Humanities and Social Sciences Senior Honors Thesis Program and the Expeditions grant, which aims to help the understanding of the flow of information and levels of communication of caregivers associated with a classroom for 4-7 year old children with special needs, behavior problems and/or diagnosed with Autism Spectrum Disorder (ASD), enrolled in an Alternative School Placement (ASP) at Programs for Living, Education and Advocacy (PLEA), Pittsburgh.

Through a series of in-class observations and interviews with the educators, it seeks to advance insight into the frequency and value of communication between the educators, parents and other involved caregivers of the children.

The information gained will be utilized to inform the development of processes and technology in the future, which can assist these caregivers in their ability to provide for the children.

Table of Contents

Introduction

I began working as a research assistant under the guidance of Dr. Anind Dey, Associate Professor in the Human-Computer Interaction Institute, as a sophomore in the Bachelors of Human-Computer Interaction. My responsibilities included assisting Ph.D. and Masters level students with field research and documentation.

In the semesters leading up to my senior year, I completed all required courses in the double major which overlapped with the Masters program and continued to ask for increased responsibility as a research assistant. During the second semester on my junior year, I was invited to apply for the Dietrich College of Humanities and Social Sciences Senior Honors Thesis Program, while I was also asked to join the Expeditions grant in UbiComp.

Through discussions with Dr. Dey and the Director of the Information Systems Department, Dr. Randy Weinberg, I applied for the Senior Honors Thesis Program to conduct research for the Expeditions grant, and be advised by Dr. Dey.

Once accepted into the program, I worked with Dr. Dey to schedule meetings in preparation for his year long sabbatical that began in June 2011. We interacted via weekly Skype meetings, in addition to email updates, starting in the Fall 2011.

My thesis project has been altered from the original proposal as it became evident in Fall that the process of establishing a relationship with an Alternative School Placement (ASP) institution in Pittsburgh to conduct research would take several weeks of communication and visits to the facility.

Since I did not have any previous domain knowledge about Autism, I modified the project to be an exploratory research at an ASP, with focused observations and interviews to understand the various interactions amongst the caregivers such as the educators, therapists and parents, and the impact of the information exchanged between them.

My goal for the Fall semester was to gain domain knowledge about Autism, visit ASP institutions in the Pittsburgh area and learn about current technology used by the institutions to facilitate teaching and communication methods used amongst caregivers. By the end of the Fall semester, I hoped to have completed all required IRB documentation for the institution I selected to pursue working with through Spring semester.

To conduct observations and interviews at Alternative School Placements (ASP), this project required IRB approval. I was one of three researchers working on this project; Gabriela Marcu, a third year Ph.D. student was working on establishing a relationship with the Children's Institute in Pittsburgh and, Kevin Tassini, a graduate from the Masters of Human-Computer Interaction program was working with Archway is Philadelphia and Bancroft in New Jersey. The IRB forms for Parent and Staff consent had to be revisited several times in Fall to include requests from each of the institutions we were interested in pursuing further.

Contacting Institutions

The Fall semester was extremely challenging as approaching institutions and persons involved in the Pittsburgh Autism community without a background in Special Education, Psychology, previous work with mental disabilities and in the absence of in-person guidance from my thesis advisor proved difficult. I had the chance to visit the Hope Learning Center in Wexford, PA early in the Fall semester with Gabriela Marcu, the Ph.D. student involved in the Expedition grant, the distance to the institution and infrequent response from the contact persons reflected that in the interest of time, I should continue searching for another institution to work with.

In order to progress towards establishing a lasting connection with an institution within Pittsburgh, I reached out to two tremendously helpful professors on the Carnegie Mellon University's campus that have conducted Psychology and Computer Science research with individuals with Autism for several years, Dr. Marlene Behrmann, professor in the Department of Psychology and Dr. Jill Lehman, adjunct professor in the School of Computer Science.

I was introduced to Programs for Living, Education and Advocacy (PLEA), in Wilkinsburg, by Dr. Behrmann as a student researcher and invited to visit the facility in early October. It was through several visits during the Fall semester

that I determined PLEA would be the institution I would be interested in continue working with for the Spring semester.

I selected PLEA after my visits in fall as it was apparent that- it was easy to access on a weekly basis, the staff was approachable and willing to explain their work, the administration was exceptionally helpful in providing relevant literature and taking out time to familiarize me to the environment, and appeared to be excited by the prospect of to working together for the next few months.

I reached out to Dr. Lehman, based on a recommendation from Dr. Behrmann, to further understand the behaviors of autistic children, navigate through the information I was receiving from the institutions I had a chance to visit, look for areas within classrooms that could be researched further, understand various methods of research that could be implemented and ask questions that arose through the process.

While Dr. Dey was my advisor for how to proceed through this thesis project using Human-Computer Interaction methods, Dr. Lehman supported my understanding of Autism and the different roles that existed within the ASP teaching institutions.

Domain Knowledge

I began the Fall semester by creating an in-depth plan to gain domain knowledge about Autism Spectrum Disorder (ASD), technology used by schools in Pittsburgh to support Autistic children and the various teaching methods used by schools. In this section, I have covered the basic description of Autism as I have come to understand it disorder, the criteria for diagnoses, four different teaching methods employed by institutions for children with Autism, and summary of a workshop I attended which focused on iPad applications for children with Autism.

Autism: A Spectrum Disorder

Autism is a disorder that appears differently at each age for different individuals, and is thus best described a spectrum. The spectrum ranges from children or adults that are non-verbal with very few skills to children or adults that have a complete vocabulary and several skills, frequently described as low functioning to high functioning. Boys are four times more likely to be on the Autism Spectrum Disorder (ASD) than girls, and I saw this ratio in place at PLEA in the Spring semester. The symptoms change with age as Autism affects all mental development; it is possible for symptoms to disappear and new ones to appear. A child with Autism will follow a set routine through the day and any changes in the routine will offset his ability to perform tasks or remain emotionally stable.

The American Psychiatric Association's Diagnostic and Statistical Manual-IV, Text Revision (DSM-IV-TR) 1 provides standardized criteria to help diagnose ASDs. [Taken from the Center for Disease Control and Prevention http://www.cdc.gov/ncbddd/Autism/hcp-dsm.html]

A. Six or more items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):

1. Qualitative impairment in social interaction, as manifested by at least two of the following:
    a. Marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
    b. Failure to develop peer relationships appropriate to developmental level
    c. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
    d. Lack of social or emotional reciprocity

2. Qualitative impairments in communication as manifested by at least one of the following:
    a. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
    b. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
    c. Stereotyped and repetitive use of language or idiosyncratic language
    d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

3. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
    a. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
    b. Apparently inflexible adherence to specific, nonfunctional routines or rituals
    c. Stereotyped and repetitive motor manners (e.g., hand or finger flapping or twisting, or complex whole-body movements)
    d. Persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

C. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

Domain Knowledge

Morningside Model for Generative Instruction

The Morningside Academy in Seattle guarantees the students at academy a gain of two to three grade levels in each academic year. The Morningside Model combines well-designed instructional materials, fast-paced classroom presentation, and focused practice to fluency. The data collected for the instruction is based on Precision Teaching*, a method of programmed teaching based on frequency data, recorded on the Standard Celeration Chart*.
*explained in detail under Standard Celeration Chart.

The seven tenets of the Morningside Model (Johnson & Layng, 1994), are-
1. Identify the component elements of instructional objectives.
2. Measure their frequency until true mastery, defined by REAPS (retention, endurance, application, performance aims, standards), reached (Binder, 2005).
3. Establish a component behavior through highly interactive, contingent exchanges between learner and teacher, until behavior stays accurate at gradually increasing frequencies.
4. Build the component skills to fluency aim to ensure remembering.
5. Build the endurance of component skills that are repeated in succession en masse in the real world.
6. Include application activities that allow multiple component skills to combine in ways that define the higher-level complex activities of an expert in a field.
7. Alter the procedures for implementing the Morningside Model according to the data collected.

Applied Behavior Analysis

The most common teaching methodology used by schools in across the country is an approach that was derived from learning theory (Lovaas, 1987). Through the ABA approach, a socially significant behavior of the child is targeted, such as learning to indicate body parts. An environmental modification is then introduced to indicate when the correct response is received from the child, such as an edible for identifying the parts correctly.

The responses are then objectively measured to see the child's progress. The edible serves as a tangible reward for the child and is necessary for early intervention in children with Autism because children on the ASD are not as responsive to social cues such a positive emotional response for a correct answer, as a child not on the spectrum.

Baer, Montrose, & Risley's 1968 article is used as the standard description of ABA; it describes the seven dimensions of ABA: application, a focus on behavior, the use of analysis, and its technological, conceptually systematic, general and effective approach.

Domain Knowledge

Treatment and Education of Autistic and Related Communication-Handicapped Children

Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH), is an evidence-based service, training, and research program for individuals of all ages and skill levels with ASD. It was developed by Eric Schopler and his colleagues at University of North Carolina (UNC) Chapel Hill in the early 1970s, (Shopler & Mesibov, 1995); TEACCH has been implemented at a State level in North Carolina. TEACCH is often preferred over other teaching methods as it is easy to implement within an existing school structure.

TEACCH methods are based on the premise that people with Autism are predominantly visual learners, so intervention strategies focus on physical and visual structure, schedules, work systems and task organization. Individualized systems aim to address difficulties with communication, organization, generalization, concepts, sensory processing, change and relating to others.

Activity Schedules

Activity Schedules were developed at the Princeton Child Development Institute to allow children to complete tasks with reduced adult supervision, (McCallnahan & Krantz, 1997). For instance, a child would follow a daily routine in the afternoon taking off his shoes, putting away his book bag, working on a school assignment and eating a snack.

Teachers assist parents of children with Autism to implement schedules at home, as they would in school, beginning with a photographic schedule and slowly progressing to more complex tasks. The method requires a front loaded time commitment from the parents but with time, the child is able to perform the tasks in the schedule with little to no supervision.

The goal is to teach a child with Autism to make effective use of unstructured time at home and adjust with ease to changes in routines.

Domain Knowledge

UCP Kids iPad Workshop

In several articles about Autism Spectrum Disorder (ASD) featured in the news and media in the past year, especially 60 Minutes' Apps for Autism (http://www.cbsnews.com/video/watch/?id=7385686n), I became aware of the peaked interest amongst educators and parents to use iPads for teaching children. Through guidance of Dr. Lehman, I attended a three-hour workshop at the center for United Cerebral Palsy Kids (UCP Kids) in Regent Square, which walked the audience of parents, educators, and therapists through hundreds of the iPad apps that were available in the Apple App Store.

The apps ranged in price from $4.99 to $499.99, but had very similar functionality. Each app allows the adult supervising the child to build a program for the child to follow such as a picture vocabulary for requests, a picture display of schedules, and teaching programs for colors, shapes, objects, etc. There are apps that are tagged specifically as apps for children with Autism, but apps under education for young children can also be utilized for children with learning disabilities such as Autism.

Alternative School Placement (ASP) institutions in Pennsylvania that follow the PA Cyber School curriculum, receive iPads for the children in the program. For instance, at Hope Center for Learning in Wexford, the children in the kindergarten classroom each have an iPad and time structured to interact with it in their daily schedules.

Even though there has been increasingly positive feedback from parents and educators on the iPad apps, as seen in the workshop and at Hope, there is no metric for how successful the apps are in teaching the child in comparison to direct teaching methods used by the educators.

Spring 2012

Through discussions with PLEA towards the end of the Fall semester, I created a schedule to conduct observations in the classroom for 4-7 year old children and interviews with the staff starting in Spring. My goal was to understand the organization of roles within the classroom and PLEA, routines in the classroom, interactions of the staff with the parents and each other, and learn about children with Autism by directly observing them.

The sections that follow are a description of PLEA, the organizational structure, classroom structure, staff interaction with parents and each other, and insights from the observations conducted in the classroom for 4-7 year old children and interviews conducted with staff members- the Behavior Analyst Consultant, the Special Education Teacher in the classroom, the Mental Health Therapist, a part time Training Liaison, and two Instructional Support Staff in the classroom.

History of PLEA

The Parents League for Emotional Adjustment, PLEA was established in 1964 by a group of middle class parents of children with the Pervasive Development Disorders and children that were categorized as "Emotionally Disturbed" at the time. In 1966, PLEA became a non-profit that began advocacy and support groups for children and adults with behavioral and developmental disabilities.

In 1969, PLEA opened its first classroom for children between the ages 5-7 year old that were diagnosed with ASD and other childhood disabilities. Since 1985, PLEA has served as a school-based partial hospital, where students spend school hours in the institution and commute to school from their homes on a daily basis. As a partial hospital, PLEA provides licensed mental and health services in each classroom for the children, through formal Mental Health Treatment Plans that are reported to Community Care, Behavioral Health Organization.

In 1998, PLEA implemented six classrooms for elementary school children that were placed in an Alternative School Placement (ASP) by their school district. PLEA serves as an ASP for over twenty districts in the Allegheny County, mainly for lower and middle-income families with children that have special behavioral and development needs.

PLEA has employed teaching technique in classrooms that were based on concepts from ABA, the TEACCH* program in North Carolina, the Activity Schedule program at Princeton Child Development Center* in New Jersey, and currently follows the training from Morningside Academy in Seattle for Generative Instruction*.

* explained in detail under Domain Research.

Implementing Generative Instruction

"It's much easier to teach people instructional delivery, and instructional design techniques, who are already pleasant. If you have somebody who can't stop trying to get a student to stop misbehaving, and stays focused on all the things the student does wrong, that's very hard to turn around." Behavior Analyst Consultant, PLEA

PLEA implemented the Morningside Model for Generative instruction in 2001, starting with one experimental classroom. The goal of the Behavior Analyst Consultant (BAC) was to use to train staff using the Academic Generative Instruction for Learner Enhancement (AGILE) which focuses on knowledge by acquaintance, and create a pyramid model for training so that after the first few classrooms had received training; the staff was able to support each other through the process.

The BAC spent a total of 3-4 months with the teachers in the experimental classroom, helping them focus on building new skills, instead of the behaviors of concern that the child displays in the classroom. His aim was to coach the teachers, not supervise, and thus maintain the contingency between the teacher and child while providing insights and suggestions.

The teachers had less than a week in the summer to prepare for the new method of instruction, in which they bought supplies for the classroom and practiced the Standard Celeration Chart* with the BAC till the school began it's Fall term. During the term that the BAC spent time on training the teachers as they interacted with the students, and assisted them in learning to provide sufficient

stimulus control for each child to instill new skills and knowledge.
* explained in detail under Standard Celeration Chart.

PLEA maintains a Human Resources (HR) department that advertises open position via their website and other online channels, and conducts the interview process for these positions. If the candidate holds a Masters level degree, then the BAC conducts a second level of interviews after the HR department. The HR department and BAC have an additional bias that they check for during the interviews, the bias is to see if the candidate is pleasant.

The current administrative staff believes that a candidate that shows a strong foundation in being pleasant through his past experiences, will be easier to train and make a better staff member in terms of interaction with other staff and especially with the children, as the teaching environment at PLEA or any ASP can frequently become stressful.

Organization Structure

"PLEA tends to get kids who can't learn, that tends to be the attitude. We have discovered through our methods of instruction that these kids absolutely can learn, the problem is that the rest of the world just doesn't slow down enough, and explore the kids individually to find out what they can do" Mental Health Therapist, PLEA

Until last year, PLEA classrooms were structured for all staff in classroom to hold equal responsibility, with an additional Therapeutic Support Staff (TSS) to aide teaching. Since PLEA is a school and a partial hospital, all teachers were required to take academic data for the Individualized Education Programs (IEP) and behavioral data for the Mental Health Treatment Plans (MHTP). Teachers and the TSS were required to put in a certain number of in-home hours in addition to the school day, during which they would work one on one with students from PLEA and other ASPs, towards goals outlined by the Behavior Specialist Consultant (BSC), who did the preliminary observations for in-home assignments.

Since last year, the classrooms have been restructured to have one Special Education Teacher that is responsible for the academic programming and IEPs for each child in the classroom and one MHT is responsible for the MHTP and behavioral objectives. The Therapeutic Support Staff are now called Instructional Support Staff (ISA) and two ISA's are assigned to each class to assist the teacher and MHT in the classroom. The teacher and MHT are no longer required to do in-home sessions and focus solely on the classroom instruction. The ISA's are referred to as TSS when they do in-home sessions after the school day; they do "wrap-up" sessions with students from PLEA and children in other ASPs that need assistance beyond the school.

The PLEA license requires children to be placed in classrooms by age, a child needs to be placed in a classroom within three years of his age. The organization would ideally prefer to have them by academic compatibility, as it is difficult for the administration to support the performance management of the educators in the classroom, because there is a range of skill amongst the children. For example, in the classroom that I conducted my observations, there is a child that has the ability to read and another who is non-verbal with a picture vocabulary of only twenty-five words.

The MHT bills hours towards Medical Assistance funds and id required to review the MHTP with the Medical Director of PLEA every twenty school days, as stated by the Pennsylvania licensing authority. PLEA is required to staff the classrooms, create mental health objectives and send a daily note home regarding the objectives for each child in the school, as each child at PLEA has to have a mental health diagnosis.

The administrative staff at PLEA adheres to a non-linear contingency analysis for organizational management, which has the primary goal of assigning administrative staff responsibilities to find ways to reinforce the direct care staff. The administrative staff strive to have a system in which they can clearly identify who is doing what to reinforce that direct care staff, and when to best support the direct care staff, for instance, does during the class instruction work better than after the school day.

PLEA has two Training Liaisons (TLs) that work part time and come in once a week to assist in a classroom that needs an additional staff member or is looking for ways to change instruction. The two TLs were classroom teachers in the initial experimental classroom for Generative Instruction and thus have close to ten years of experience with the teaching model and PLEA. Their primary goal is to assist new and existing staff members by brainstorming methods to modify the instruction, to make it more effective for the children and staff in the classroom.

At any given time, PLEA has one or two contracted full-time Speech and Language pathologists (SLP) and a part time Occupational Therapist (OT). PLEA has a strong relationship with the Assistive Technology Lab at the University of Pittsburgh and currently there are three skilled SLPs from the lab that PLEA works with.

Organization Structure

"Sometimes the SLPs ask our kids to do things and when our kids don't do it, then they write a note that the student is uncooperative, instead of – I didn't figure out a good ways to ask" Behavior Analyst Consultant, PLEA

The BAC teaches the SLPs additional techniques that are not a part of their theoretical training, but are necessary for them to work with the children at PLEA.

Children that come to PLEA with an Early Intervention diagnosis are immediately assigned a part time OT and Physical Therapist (PT) by the Allegheny Intermediate Union. These OT and PT staff are not supervised by PLEA and conduct their sessions with the children at their own discretion.

Children that attend PLEA as an ASP travel to and from the school in buses provided by the district. Some of the children have sitting in their seat for a long period of time during the travel and have to wear a holster. The decision to implement a holster was made by the families of the children and their district, as the PLEA is not involved in the child's needs once they are on the district's bus. PLEA provides vans through a state funding stream that covers the expense for districts that choose not to provide a bus, in the case that only have a single child traveling to the school, driven by the PLEA staff, with PLEA teachers that ride along with the children to assist.

PLEA bills the district and medical assistance stream by the hour, if PLEA decides to take the children on a field trip or the child is absent, there is no pay since the child is not within the building.

PLEA was a default program when a child was unable to keep up with the school curriculum due to behaviors of concerns. In the last few years, school districts recommend PLEA to families that have children that need a restrictive and constrained environment for learning. The school district provides a recommendation for schools the child may receive an ASP in, the parents visit the schools and have to come to an agreement with the district based on the level of need of the child.

The district creates a contract with PLEA, which defines level of need for the child based on his previous experience with the school district. The existing evaluation given by the school district and the IEP provided are followed for the first year and PLEA staff work to meet the outlined goals. The school district also reviews the Positive Behavior Support Plan, which the MHT and teacher write in collaboration.

During the child's first year at PLEA, the staff follows the IEP provided by the school district, which is based on the child's age. However, this is extremely challenging for the classroom staff as the child's ability to meet the goals outlined in the IEP often falls short, for instance- a non-verbal child in the classroom had no vocabulary during his first few months at PLEA. Through sessions with the SLP and dedicated brainstorming sessions amongst the staff, he now has a picture vocabulary of twenty-five words. The IEP goals expect the child to be working on solving basic math problems, which is a far-reaching expectation. At PLEA, the staff works with each child by paying close attention to their present skills and abilities, and setting goals accordingly, but the district will often create an IEP for the first year for PLEA to follow without any collaboration.

The family and school district can decide for the child to return to the district at any point, to the district special education program or a regular school program. With recent budget cuts, several districts have looked at bringing children at PLEA to return to the district's program but the parents have refused, as they believe their child has shown increased learning in the PLEA environment.

Organization Structure

"My reason for assigning you to Room 1 (classroom for 4-7 year old children) at PLEA was (for you) to see the full range of this 'spectrum disorder' we have labeled Autism; children who have only been receiving generative instruction at PLEA for a shorter period of time than those in our older student classrooms; a group of pretty pleasant staff face a very difficult challenge of conducting data-based instruction with a diverse group of children across quite a continuum of, euphemistically named, 'learner readiness.'

The hardest challenge the staff are facing at the moment is the admission of a child with a long history of doing things described as "Oppositional Defiant D/O (disorder) and Disruptive Behavior D/O (disorder)" with an already quite diverse group of kids who are described as or labeled Pervasive Developmental D/O(disorder). The breadth of knowledge necessary to achieve learner outcomes at some steady rate with this disparate a group of learners is tough. Their strength is maintaining their continuous assessment and intensive instruction that is part of generative instruction in the face of a tremendous ongoing need to conduct motivative analyses for how the kids are coming to do the movements that concern others ('behavior problems).

With budgetary problems in the macro-system, we are faced with structural change within our programs at PLEA. In amongst the changes that come from money concerns, I will continue to build skills amongst the staff and thank them for the amazing pleasant effective instruction they offer their learners."

Dr. Bill Helsel
Behavior Analyst Consultant, PLEA

Classroom Organization

"The public school's have done all that they are mandated to do (for the child) and it's not worked so they obviously are not going to be able to learn. Its an attitude that sometimes even presents in the paperwork" Mental Health Therapist, PLEA

Within the classrooms, the Special Education Teacher and Mental Health Therapist (MHT) share approximately equal responsibility to implement gross and fine motors skill building and group work. While the teacher is directly responsible for the IEPs of the children, the MHT is responsible for the MHTP.

On a daily basis, each staff member in the classroom, including the Instructional Support Aides (ISA) take data on the Standard Celeration Chart (SCC)* for fluency instruction and write a daily note home to the parents about the child's behavior through the day.
*explained in detail under Standard Celeration Chart

In the classroom that I observed, the teacher conducted the morning circle time and afternoon table time, and the MHT conducted the group game and afternoon circle time. The special education teacher creates and updates the IEP for each child, and creates a nine-week report that is similar to a report card in a regular school system. Since there are no grades assigned to students in an ASP, the nine-week report addresses detailed IEP goals that the child was working towards, in the form of a narrative.

The MHT designs the behavioral objectives, and notes down the daily data, weekly data and monthly data towards progress on behavioral objectives on respective SCC charts and as narratives. While behavioral objectives vary from child to child, PLEA does not have a disciplinary mission statement, the behavioral objectives are similar to Latham's tools for positive parenting, such as addressing lying, tantrums and hitting.

A child's first week of school at PLEA is based on paper work from school district that sends the child and short observations in the classroom. The MHT writes a one-page document on behavioral need narrative, which is submitted to the specific stream they will be billing for the child. Once approved, the MHT

continues short observations over the first month to identify the child's needs in the restrictive environment of the classroom, and immediately notes behaviors that impede learning, distract other students, are self-injurious or injurious to others.

For each child, the MHT creates individual, group, and learning skills goals; the focus of the goals is to design skill-building programs, instead of interventions, and use those skills to occupy the child when he exhibits a behavior of concern. Treatment goals are worded similar to an IEP, they specific behaviors the classroom staff is looking for the child to display rather than behaviors they are trying to prevent. The treatment goals are listed on the celeration charts, and the behaviors of concern are marked on the Behavior Scatterplot*. An individual goals seeks to build replacement behaviors for behaviors of concerns such as aggression or spitting

Learning skills goals help academic work. For instance, making eye contact, following simple directions, siting and attending circle time. Group goals are similar to learning skills goals, such as, sitting and attending with peer distractions, answering on cue , as such reducing instances of behaviors of concern, focusing on reinforcement on positive behavior
*explained in detail under Behavior Scatterplot.

In the classroom that I had a chance to observe this semester, the classroom staff is consciously makes sure the children do not know the differences in roles amongst the staff. Each staff member will work with a different child for the day or sometimes even for each activity through the class schedule. The staff understands that there is value in functioning as a team so that the children do not try the "mom-dad" conduct, where if one staff member refuses a request they try to convince the other or assume another staff member has more influence.

Classroom Organization

As PLEA uses the Standard Celeration Chart* to record data for each child in the classroom, the chart provides flexibility to the staff members to work with any child in the classroom by viewing their present and past charts. This allows each staff member to stay updated with all the children in the classroom by working with each over the course of the week. This method of shared teaching allows the staff in the classroom to frequently brainstorm ideas together for all the children. Frequently a staff member working with a child will drop the floor*, modify the exercise to see consequences and announce to the other staff in the classroom to notify them. Similarly, all staff members in the classroom record the child's behaviors of concern, and discuss amongst each other the child's progression via the scatterplot.

* explained in detail under Standard Celeration Chart

The chart and scatterplot allow the staff to visually see each child's development and stay on the same page with each other. Each staff member feels equal responsibility towards brainstorming new ideas and implementing programs, as the child is shared responsibility.

PLEA does not have state of the art technology such as iPads in their classrooms but has simple artifacts such a touch screen monitor connected to a Windows XP machine, and a television with attached consoles for video games. Non-verbal children are provided with speech assistance tablets by their SLPs based on their progress. The tablets are programmed by the SLP for each child's vocabulary capabilities, and can be carried home by the child.

Standard Celeration Chart

"Every design implementation is documented, and whether or not it works is documented and you can track the kid back and that one teacher with a fresh idea can go through and see what's worked and what hasn't worked over even 5 years and its what's most institutions cant or don't do, its pretty unique" Behavior Analyst Consultant, PLEA

The Standard Celeration Chart is a measurement system that can allow a teacher to identify when a student has mastered a specific skill; it displays both accuracy and frequency of the skill. Dr. Ogden Lindsley created the chart, to support Precision Teaching- a set of methods based on a belief that systematic and precise evaluation of instruction allows maximizing the learner's personal fluency measures, (Binder & Watkins, 1990).

The chart is a 6-cycle, and semi-log graph created for Precision Teaching. It allows teachers to predict the learner's future movements fairly accurately as the 34 degree diagonal angle translates to a doubling in acceleration, in line with the overall guarantee given by Morningside*.
* explained in detail under Domain Research.

The chart uses a multiply scale as behaviors have been seen to increase exponentially, for instance- behaviors which occur at higher rates increase at faster rates. The chart indicates the behavior needs of the learner, and these are established before instruction is started. The slope indicates acceleration or deceleration, the two progress measures, the steeper the slope, the faster the progress.

A Timings chart is used by teachers to record progress within session practices, and has ten practice sessions per chart. The best timing from the practice session is transferred to the Daily chart for the appropriate date. The
Daily chart values indicate whether the student has reached a mastery level in the exercise such that his behavior is fluent, which comprises of-
1. Behavior can be retained even after a period of no practice.
2. Behavior can be performed regardless of distractions.
3. Behavior can be performed over an extended period.

The most powerful aspect of the chart that I have seen at PLEA is the ability of any staff member in the classroom to work with any child to understand past progress, implement an existing program, and modify the program to try a new idea. The flexibility the chart provides extends outside the classroom as well, as all staff members at PLEA are trained in using the chart, they can assist within any classroom and can actively contribute in the Chart Shares*.
* explained in detail under Chart Share.

"(With the) chart and the way we instruct- any teacher should be able to take the child's book, tell you what the kid's working on how successful it's been and sit down and implement the program with the student"
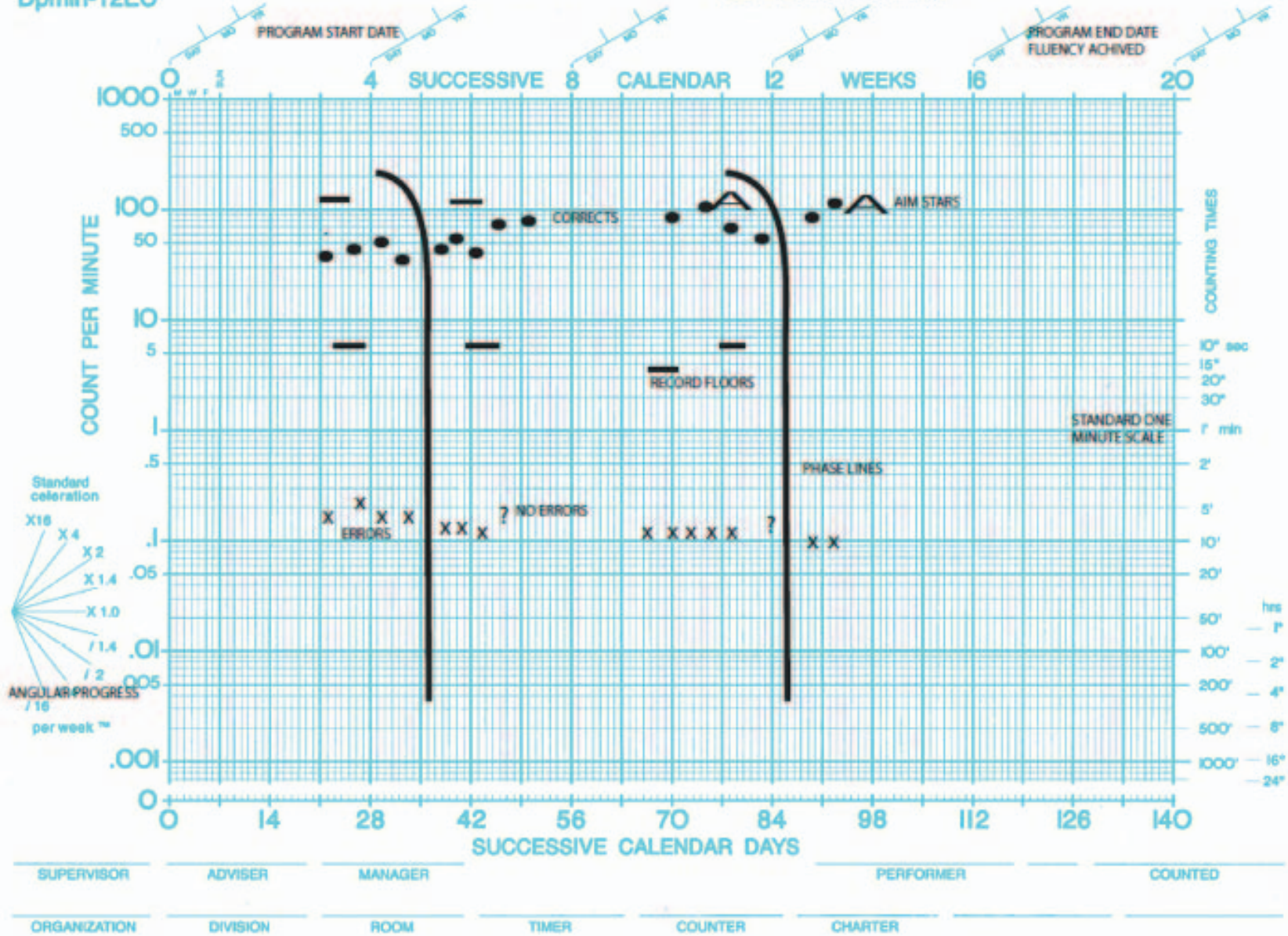Behavior Analyst Consultant, PLEA

Key

Adapted from the Behavioral Institute for Children and Adolescents' Standard Chart Glossary

Standard Celeration Chart: A standard, six-cycle, "semi-logarithmic" chart that measures frequency as count per unit of time up the multiply-divide y-axis, and that measures celeration as count per unit of time per unit of time. This Chart has standard celeration reference lines such that a line drawn from the bottom left corner to the upper right corner is 34 degrees and has a celeration value of X2 ("times two"). Also known as a Standard Behavior Chart.

Targets: Acceleration targets or corrects are marked at dots, and deceleration targets errors are charted as crosses.

Add-Subtract Scale: Any scale on which adding or subtracting by a constant amount is represented by a constant distance. The horizontal, or X-axis, of the daily Standard Celeration Chart has an add-subtract scale of Successive Calendar Days.

Base Level: On a chart the base level indicates where a cycle starts as measured vertically. Two cycles may have a different base level and amplitude even though their phase, period, and frequency are equal.

Behavior Floor: The lowest daily frequency possible for a particular behavior; 1/number of minutes the behavior can occur.

Celeration: The unit of measurement of behavior change; a change in frequency per unit of time; 3 dimensions: number per unit of time per unit of time. A common representative example is count per minute per week.

Celeration Line: A best-fit, straight line drawn through a set of frequency points on a Standard Celeration Chart.

Count: Enumeration: The number obtained by counting; total. Count forms one of the two dimensions of any frequency.

Counting Period Floor: The lowest frequency detectable by a given counting procedure; 1/number of minutes spent counting. Also known as a Record Floor.

Cycle: The vertical range or distance on the y-axis of a Standard Celeration Chart between consecutive powers of 10. The Standard Celeration Chart has 6 cycles: .001 - .01, .01 - .1, .1 - 1, 1 - 10, 10 - 100, 100 -1000 per minute.

Daily Behavior Chart: A Standard Celeration Chart with frequency ranging from .001 per minute up to 1000 per minute on a multiply-divide scale along the y-axis, and Successive Calendar Days on an add-subtract scale along the x-axis; the most commonly used, and "typical" Standard Celeration Chart.

Day Line: A vertical line on the daily Standard Celeration Chart., the bold lines are Sundays, each week has 6 lines after Sunday. The daily chart has 140 day lines.

Event: Anything that happens or is regarded as happening; an occurrence. A change or displacement that can be observed, detected, counted, and measured.

Frequency: The number of movements or events per unit of time; the standard unit of behavior measurement. In the physical sciences frequency is expressed in cycles per second.

Frequency Line: A horizontal line running across the Standard Celeration Chart. Each cycle has 10 parallel frequency lines, which get closer and closer together as one moves up a cycle.

Frequency Multiplier: The value by which one frequency gets multiplied by to obtain a second frequency; the ratio of two frequencies. A frequency divider would mean the same thing, except the operation involves division.

Geometric Mean: The appropriate measure of central tendency on a multiply-divide scale. On the Standard Celeration Chart you derive a geometric mean by multiplying N number of frequencies and then taking the Nth root of that.

Movement: A pinpointed and recorded behavior.

Movement Cycle: A movement or event that has a start time, a duration time, and a stop time.

Multiply-Divide Scale: Any measurement scale on which multiplying or a constant distance represents dividing by a constant amount. The vertical, or Y-axis, of the Standard Celeration Chart has a multiply-divide scale of Count per Minute. This scale is also known as an Equal Ratio Scale.

Overall Celeration Line: A celeration line drawn through all of the frequency points on a Standard Celeration Chart, regardless of trends, phase-change events, or regular periods of time.

Period: The time between peak amplitudes or crests of waves. Period is in inverse proportion to frequency.

Periodic Celeration Line: A celeration line drawn through al of the frequency points on a Standard Celeration Chart within a specific time period, regardless of trends or phase change events. On a daily Chart, the time period is often biweekly or monthly.

Phase: A difference in starting point for signals or events with the same period. Events can be in phase or out of phase with each other.

Phase Line: A vertical line indicating the day at which an event took place, to see the affect on celeration from that day forth.

Slice: A vertical line representing a smaller movement or slice of the original movement is being charted.

Behavior Scatterplot

The scatterplot is used to chart behaviors of concern that the staff is trying to decrease over time. Each chart represents one month, and allows the staff to look across the chart to see the change in behavior and relate it to the child's Daily chart over the period of the month to compare with learning. The staff add Phase Lines to the scatterplot each time one is added to the Daily chart to have a better understanding of the changes in behavior that are directly affected by events. Each box is a 15-minute interval and the time periods allow the staff to prepare for recurring behaviors during the day, and brainstorm why the behaviors are occurring.

BEHAVIOR ACROSS TIME SHEET (A Scatterplot)

(Each Box is One 15-Minute Interval)

Person's Name:

Behavior(s) of Concern: Month:

Time	Wk1						Wk2						Wk3						Wk4					Wk5	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
8:30																									
:45																									
9:00																									
:15																									
:30																									
:45																									
10:00																									
:15																									
:30																									
:45																									
11:00																									
:15																									
:30																									
:45																									
12:00																									
:15																									
:30																									
:45																									
1:00																									
:15																									
:30																									
:45																									
2:00																									
:15																									
:30																									

Staff Support

"I love the people here, especially now, in the past two years, of how close everybody gets, and we can joke around and be silly but get what we need to get done" Special Education Teacher, PLEA

Through the interviews that I conducted with the staff, it became clear that the staff were motivated to work at PLEA despite the suboptimal pay, as mentioned frequently in interviews, due to the success they see with the children and the supportive staff network. There has been a change in the supervisors over the past two years and the structure of the administration is now centered on providing enhanced support the direct care staff, teachers, MHTs, ISAs, and SLPs. The administration redistributed the classroom staff two years back to separate cliques that had formed over time and reinforce that classrooms were not in competition with each other.

One of the reasons that seem to have strongly influenced the atmosphere in the past years was the high staff turnaround, staff was hired for a short duration of a few months and that led to weak relationships amongst the staff members. Most of the teachers and MHTs in the classrooms have now been at PLEA for over five years and most ISAs have been working for over a year.

The administrative staff namely the school principal, medical director and BAC meet with each of the classroom staff on a weekly basis, have group meetings with a few classrooms at a time to discuss techniques on three days of the week, and have a weekly Chart Share where one member of staff from each classroom shares one chart. The current staff actively interacts with each other during the regular school day at pick up and drop-off times, during Chart Shares*, occasional happy hour, and the end of the year party hosted by the BAC.
*explained in detail under Chart Share.

"It really is like a family here"
Special Education Teacher

Chart Share

"People want to be there... It's good to see what everybody else is doing and them you can get some ideas"
Special Education Teacher, PLEA

The creator of the chart, Dr. Ogden Lindsley, conceived the idea of a Chart Share. He believed that by sharing charts, both lemons (ones that do not show significant improvement) and peaches (the ones that show progress), within an organization would allow the staff to support each other by giving and receiving suggestions on program implementations.

The BAC at PLEA started Chart Shares on a weekly voluntary basis, after implementing the first classroom with the Morningside Model of Generative Instruction. The staff did not immediately see the benefits of the Chart Share as not all classrooms were using the chart and it took several years for the all staff to voluntarily attend the Chart Share each week. The BAC began the Chart Shares on the same premise as Dr.Lindsley and has over the years noticed that the weekly Chart Shares positively reinforce the staff.

The Chart Share allows the staff to understand how other classrooms are implementing programs without having to know the child's treatment plan or ability. By seeing a child's acceleration and deceleration based on the modifications to an implementation, the staff is excited to share their own classroom's charts in hope to receive feedback on a program that may not be working as expected or provide new ideas to the other classrooms.

Parent Interaction

"We cant force them to read it (monthly narratives)… we hound people to send them (signature acknowledgements) back…I've only had one parent show up in 8 years (for the monthly meetings)" Mental Health Therapist, PLEA

Parents have access to all information on request, and open invitations to monthly meetings that are scheduled two weeks before the MHT writes the monthly progress or regression on goals. In these meetings the entire classroom staff is present and are expected to explain the current goals with respect to the celeration charts and behavior scatterplots. The monthly progress note is sent home with a signature page two weeks after the meeting, and parents are required to send the signature page back as an acknowledgement of receiving the document. In addition to the monthly note, the staff sends home daily or weekly notes based on the parents preference, which address the child's daily experience and any behaviors of concern. The family liaisons are required to contact the parents once a month, via phone, email, or if a parent drops a child to school and they interact with the teachers or liaisons, it counts as the monthly contact.

MHTs have frequent contact with families as parents frequently ask questions about the child's behavior that are best addressed by MHT. However, increasingly the family liaisons are asked to make phone calls home as the classroom staff tries their best to maintain a positive relationship with the families and try not to be involved in sharing any undesirable news with the family unless it is an emergency.

The administration holds the responsibility to email the parents, as there are no official email addresses given to PLEA staff. The staff can use any phone in the PLEA building to call the parent but cannot share personal phone numbers with parents; the parents can contact the PLEA office or family liaisons with questions that can be redirected to the staff.

The family liaisons host a parent support group once a month, and schedule additional meetings with families that have children reaching the age of 14, at which they transition from PLEA back to their school district or another ASP with classrooms for older children, to alleviate anxiety of the transition. The transition meetings are to discuss how and why the child made progress at PLEA, and ways to continue the techniques in another school system, the districts may choose to be involved in these meetings but are often not as interested as the parents in the transition process.

The staff has seen that daily notes and phone calls are amongst the most successful methods of communicating with the child's parents. However, often notes do not come back for several days, and the responses the staff receives frequently do not pertain to the issue that needs to be addressed. The staff has seen speedier progress in instruction and learning with the students with parents that are regularly involved with their child's in-class instruction.

For instance, one of the non-verbal children in the observed classroom displayed a behavior of concern of throwing glass objects when his request was not granted at home. The parents scheduled a meeting with the classroom staff to discuss this behavior and work in tandem with the staff to implement a program at home and in the classroom. The staff and parents saw an improvement within the next week as the child soon learned that the behavior was not permitted and prevented in both environments.

"The parents are not staying aware of what's going on in the classroom, what's working, what's not working, we may be doing one thing at school but whatever is going on at home, we can't participate… When we don't have parent contact there is no way to coordinate that kind of intervention for those kids that do exhibit those kinds of (concerning) behaviors" Mental Health Therapist, PLEA

Conclusion and Next Steps

In the time I have spent at PLEA in the Fall and Spring semester, I have seen clear strengths in their existing organization and classroom structure, and also areas that could be enhanced to create a better learning environment for the students. I would like to highlight three key take-aways in this report:

1. **The Standard Celeration Chart is an Extremely Powerful Tool:** The chart allows teachers to visually see the progress they are making with the children and positive reinforces them to continue implementing the program to the best of their ability. The chart maintains data for several years and can be referred to when looking for ideas to change instruction. However, all charts are maintained on paper, leading me to wonder if digitizing these exponentially increase it's value, allowing the staff to see trends with little calculation.

2. **The Staff Work in a Collaborative Environment:** The staff at PLEA can often be seen brainstorming ideas to implement in the classroom or to the instruction. The chart is conducive to such collaboration as any staff member can be updated on a child's program within a few minutes by sharing the chart with them. The high rate of attendance at Chart Shares is evidence to the same commitment the staff have towards working together.

3. **The Communication Between the Parents and Staff is Lacking:** Despite the several methods of regular communication between classroom staff and parents, the information exchanged is not assisting the staff in implementing programs to reduce behaviors of concern, as parents relay information

erratically. Only when behaviors become concerning at home, do parents reach out to the staff to work together to implement programs similar to school programs at home. The child's progress through programs could be significantly increased if the coordination between staff and parents could be improved to communicate information regularly.

I was accepted in the Accelerated Masters of Human-Computer Interaction in the Fall 2011 and began the program this semester, in Spring 2012. I will continue working with PLEA under the Expeditions grant as an Independent Study in the Summer and Fall of 2012, and till I complete the Masters program in December 2012.

1. **Summer Goal:** To continue observations till PLEA closes for the summer and discuss the possibility of conducting observations at the summer camps, and analyze and synthesize all data collected in spring and early summer to come up with detailed design recommendations for Fall.

2. **Fall Goal:** To create, test and implement a design idea into the classroom at PLEA and evaluate the implementation.

Acknowledgements

Bibliography

Baer, D., Montrose, W., & Risley, T. (1968). Some current dimensions of Applied Behavior Analysis Journal of Applied Behavior Analysis 1968, 1, 91-97 Number 1 (Spring, 1968)

Binder, C., & Watkins, C. L. (1990). Precision Teaching and Direct Instruction: Measurably superior instructional technology in schools. Performance Improvement Quarterly, 3(4), 74-96.

Johnson, K., & Lyang, J. (1994). The Morning Side Model of Generative Instruction, from: Gardner, R., Sainato, D.M., Cooper, J.O., Heron, T.E., Heward, W.L., Eshleman, J.W., & Grossi, (1994). Behavior analysis in education: Focus on measurably superior instruction. pp. 173-197.

Johnson, K., & Street, E.M. (2004). The Morningside Model of Generative Instruction: What It Means To Leave No Child Behind. Concord, MA: Cambridge Center for Behavioral Studies.
McClannahan, L. & Krantz, P. (1997). Princeton Child Development Institute, Behavior and Social Issues, Volume 7, No. 1 , Spring 1997

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. Journal of Consulting and Clinical Psychology, 55(1), 3-3.

Schopler, E., & Mesibov, G. B. (1995). Learning and cognition in autism. Current issues in autism. New York: Plenum Press.