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Utah Classroom Models for Teaching Children with Autism

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Superheroes social skills training, Rethink Autism internet interventions, parent training, EBP classroom training, functional behavior assessment: An autism spectrum disorder, evidence based (EBP) training track for school psychologists

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Introduction

According to the Center for Disease Control and Prevention, the number of children that are diagnosed with an autism spectrum disorder has risen dramatically over the past decade alone. In the year 2000, 1 in 150 children were identified as having an autism spectrum disorder. During the most recent data analysis in 2008, it was estimated that 1 in 88 children will receive this label nationwide. This number is even more shocking in Utah, with a rate of 1 in 47 (Center for Disease Control and Prevention [CDC], 2008). With such high prevalence rates, it is imperative that effective, evidence-based treatments for autism be identified. The purpose of this monograph is to review multiple programs used in the state of Utah to address core deficits in children with an autism spectrum disorder.

As more and more families desperately seek treatments for their autistic children, more and more treatments (both effective and not) are being developed. Many of these treatments contain the underlying principles of Applied Behavior Analysis (ABA). Other treatments are embedded with other theoretic principals, such as Developmental Individual Differences/Relationship-Based (DIR). Six of the most widely used interventions, some grounded in ABA and others in DIR, will be reviewed. These include: 1) The Carmen B. Pingree Center Model, 2) Autism Support Services: Education, Research, and Training (ASSERT), 3) Strategies for Teaching based on Autism Research (STAR), 4)Learning Experiences and Alternative Program for Preschoolers and their Parents (LEAP), 6) Play and Language for Autistic Youngsters (PLAY), 5)Relationship Development Intervention (RDI).

Following a review of each model, various standards by which we may determine a program to be evidence-based will be discussed. Division 12 of the American Psychological Association (APA) has outlined standards by which a treatment may be considered "well-established" or "probably efficacious" treatments. If criteria are met and a treatment is considered well-established or probably efficacious, we may reasonably determine that a treatment's effectiveness can be due to the treatment and not extraneous factors. The effectiveness of treatments may also be evaluated based on standards outlined by the National Autism Center. The National Autism Center initiated a National Standards Project to provide a strength of evidence for common treatments, describe the age/diagnosis/skills or behavior that specific treatments are designed to target, identify limitations in the current available research, and offer recommendations for best practices when working with students with autism.

Carmen B. Pingree Center for Children with Autism

The Carmen B. Pingree Center for Children with Autism was named after Carmen B. Pingree. She was a parent of a child with autism. In the late 1970's, she embarked on a mission to obtain funding in order to open a pre-school for children with autism in the state of Utah. By 1998, a plan for an elementary school for children with autism was in the works thanks to the generous financial contributions of Susan and David Spafford. On November 21st, 2002, the vision for a school to specifically serve children with autism became a reality, and the Carmen B. Pingree Center for Children with Autism was opened. The center currently serves approximately 70 preschool aged children and 80 elementary school children. The class sizes are small with only about 10 to 12 students

per classroom with a student to adult ratio of 2:1 up to 5:1, depending on the needs of the

students. (Valley Mental Health, n.d.)

The Curriculum

Students at the Pingree center will progress through the core management

programs. The first program teaches attending and is often call the "Get Ready" program.

Students are gradually taught to independently put their feet on the floor, hands in their

lap, and eyes on the teacher when given the verbal prompt, "Get Ready!" Being able to

be ready to learn is absolutely essential to the success of each student. Once they have

mastered attending, they then move to the Following Directions Program. After they have

mastered following directions, they are then able to move on to the Generalized Imitation

Program.

Upon mastering these core management skills, students are then ready to learn

more complex abilities. These programs may include skills related to cognition, social

abilities, language, fine motor, gross motor, self-help, and academics. Each student

receives an individualized program that includes whichever skills are most appropriate to

their developmental level and their need.

The Pingree Center, in addition to its core management curriculum, utilizes and

combines multiple evidence based programs in order to maximize the learning and

progress of children with autism. These include Applied Behavior Analysis (ABA)

discrete trial format, Training and Education of Autistic and related Communication-

Handicapped Children (TEACCH), and the Picture Exchange Communication System

(PECS).

ABA Discrete Trial Format.

ABA discrete trial format requires that there is a clear on-set and off-set to each trial. Another characteristic of ABA discrete trial format is that it shapes specific behaviors, whether they are simple or complex, that the child is expected to perform. The child is prompted that the trial is about to begin. Following the prompt, child is then given a specific task. The teacher or therapist then judges the success of the performance of the child based on explicit criteria. Based on their performance, the teacher or therapist may decide whether to provide reinforcement for a successful trial or to attempt the trial again. Data is collected on each trial. Depending on the nature of the program, children are usually required to successfully complete a certain percentage of trials before they are allowed to advance to more complex skills. Upon performance (or nonperformance) of the skill, the trial is off-set and data is collected.

Ivar Lovaas is often considered the pioneer of ABA teaching methods. Although ABA is based on the work of B.F. Skinner, Lovaas developed standardized teaching techniques utilizing ABA. These techniques are often referred to as the "Lovaas Method." Multiple studies (Eikeseth et al., 2002; Eldevik et al., 2009; Sallows & Graupner, 2005; Smith, Groen, & Wynn, 2000) agree that ABA based treatments using the Lovaas Method are very effective, with positive outcomes including significant increases in IQ following participation in ABA therapy.

Training and Education of Autistic and related Communication-Handicapped Children (TEACCH).

TEACCH was developed in the early 1970's at the University of North Carolina by psychologist Eric Schopler. A typical classroom is divided up so that there are specific areas dedicated to whatever activities occur in that part of the room, such as individual

work, group activities, and play. At their work station, students are required to complete certain activities (often in an ABA discrete trial format) such as matching letters or numbers. Visual supports are used to help students transition between activities by providing students with a visual schedule. TEACCH capitalizes on the strengths of children with autism while taking into account their preference for information processed visually. (Autism Speaks, 2013; Autism Web, 2000-2013)

In a study by Aldred, Green, and Adams (2004), 28 children with autism between the ages of two and five received a treatment including speech and language therapy in combination with the TEACCH intervention. Language improvements were significant, particularly in the younger, lower functioning children.

Picture Exchange Communication System (PECS).

PECS is an alternative form of communication. It allows children with little to no speech to communicate their wants and needs with pictures and symbols. There are six phases of PECS (Charlop-Christy et al., 2002):

1) Physical exchange: In this first phase, the child is simply taught to hand to the teacher a blank picture card.

2) Expanding spontaneity: The child is taught to approach the PECS board, select an option, seek out a communicative partner, and place the option in their partner's hand in order to receive some reinforcement. The distance between the board, child, and communicative partner is gradually increased.

3) Picture discrimination: The child is taught to discriminate between multiple picture options available for selection on the PECS board.

4) Sentence structure: The child will seek out the PECS board and create a
sentence using the picture options and starting with the pictured phrase "I
want." The child then hands the sentence strip to a communicative partner
who then reads it aloud.

5) "What do you want?": The child is taught to respond to the question, "What
do you want?"

6) Commenting: The child is taught to respond to the question "What do you
see?" by selecting the appropriate card depicting the same object and
combining it with an "I see" card.

In 1994, a study by Bondy and Frost revealed fantastic success with the use of
PECS with 85 nonverbal children. After six months, 95 percent of the children had
learned to use the picture symbols for communication and 76 percent were able to use a
combination of speech and picture symbols to make requests and label items. An
additional study by Charlop-Christy et al. in 2002 also demonstrated success with a group
of children introduced to the PECS system. All children learned to use the system in a
relatively short amount of time. In addition, the authors assert that PECS teaches
functional communication behavior that can be used in natural settings.

Autism Support Services: Education, Research, and Training (ASSERT)

The ASSERT model for teaching children with autism came about as a result of a
collaborative effort between the Department of Special Education and Rehabilitation and
the Center for Persons with Disabilities at Utah State University. The ASSERT model's
primary goal is to teach children with autism communication and social skills to help

them to be successful in school. Like the Pingree Center, the ASSERT program in

grounded in principals of ABA. The program's three-fold mission is denoted in the ERT

of ASSERT:

>Education: To provide effective educational and behavioral early
>
>interventions using research based best practices
>
>Research: To conduct research to improve educational and behavioral
>
>interventions for children with autism
>
>Training: To serve as a model training classroom for USU preschool
>
>services special education teachers and to provide training opportunities
>
>for other educational professionals throughout the state of Utah who are
>
>interested in learning to work effectively with children diagnosed with
>
>ASD. (Center for Persons with Disabilities at Utah State University, n.d.)

The Curriculum

The ASSERT curriculum is broken down into several skill areas that range from

"beginning" to "advanced." The first skill is Learner Readiness. This skill is critical for

students to learn in order to be successful in the learning environment. Learner Readiness

is broken down into more basic skills that students must gain in order to be successful in

the educational environment. These include instructional readiness (which is similar to

Pingree's "Get Ready" program where students are expected to make eye contact, wait,

respond to their name, and be ready to learn), nonverbal imitation (imitating their

teacher's actions), receptive actions (performing the actions that their teacher requests),

block imitation (students copy block structures), matching (student matches presented

stimuli), sorting (students sort items or pictures), auditory/visual discrimination (student

identifies stimuli by sounds and visuals), and self-control (students work on waiting for a preferred item). Students also must learn Self-Help Skills in order to learn to take care of their own basic needs such as feeding, toileting, sleeping, and dressing.

In the ASSERT program, students will also learn Basic Language Skills and Advanced Language Skills. Learning Basic Language Skills will allow students to have more control over their own environments and to interact with others more appropriately in a communicative way. Students achieve this by mastering smaller parts of this skill such as verbal imitation and learning to identify animal sounds and body parts. In Advanced Language Skills, students will learn to produce more expressive language and to process more receptive language. They gain these more advanced skills by mastering mini-skills such as understanding opposites, pronouns, adjectives, what is missing, plurals, and conversation.

Aside from acquiring learning skills, self-help skills, and language skills, students will also learn academic skills, social/play skills, and community skills. Academic Skills involve concepts that typical kids may learn simply through observation and experience. These include skills such as labeling colors, sequencing patterns, and matching shapes. Social/play Skills will help these children to learn to interact more appropriately with peers as well as adults. These types of skills may also help them learn to use toys and other play materials. Community Skills are intended to teach children to successfully access their community through learning concepts such as street safety, going to the dentist, getting a haircut, eating at a restaurant, and other such activities that may not necessarily be considered difficult for typical children, but that children with autism may struggle with significantly.

Embedded within the typical ASSERT curriculum are multiple strategies this program endorses to aid their students in finding success in school. These methods include preference assessments, daily schedules, and naturalistic teaching.

Preference Assessments.

A Stimulus Preference Assessment (SPA) is a method that allows the teacher to identify potential reinforcers that may be most effective for a specific child. Although it may seem intuitive to just ask the child what they would like to work for, SPA's allow for the reinforcing effects of the chosen stimuli to be evaluated and the effects of different stimuli to be compared. Additionally, it allows students with no verbal abilities to actively choose their preferred reinforcer.

A child's preference may be assessed through a single-item method, a paired-stimulus method, or a multiple stimulus method. In a single item presentation, items of reinforcement are placed before the individual one at a time, multiple times each. It is then determined whether or not the child reached for the item. Their preference is measured by the percentage of times an item was reached for. In a paired stimulus, or forced choice method, reinforcer items are presented to the child in pairs, and the first item the child touches is scored as their preferred reinforcer. The pairs are presented at least twice. In a multiple stimulus method, all of the potentially desirable reinforcers are presented to the child at one time. When the child chooses a particular item, it is removed from the array of choices, and the process continues until all of the items have been selected.

Daily Schedules.

Schedules can be a very useful part of daily life for any person. They can help us to plan our lives and make our routines more predictable. These elements of regularity and predictability are particularly essential for children with autism. A visual element is also added to their daily schedules by making them photographic. Each possible part of their schedule is depicted in the form of a picture. These pictures may then be arranged daily in the appropriate order in a small 3-ring binder or a vertical or horizontal strip format. These schedules may be quite broad, simply depicting their entire day, or these schedules can be broken down into smaller activities, such as the toileting routine or hand washing.

These photographic schedules provide the children participating in the ASSERT program with a wide range of benefits. These schedules can promote independence by decreasing their need for adults to constantly prompt and guide them. Once they learn how to use the schedule, they can easily see what is coming next and know what to expect. Additionally, the use of these easily manageable photographic schedules may allow the children to have more control over what actually goes into their schedule and the order in which it occurs. The pictures in the schedule may even be paired with the word associated with the picture. This technique may promote some early sight reading.

Naturalistic Teaching Strategies.

Students can often find success in learning classroom procedures and being able to perform academic and social skills in the context of the familiar classroom, but difficulty is often found when these children are required to perform these skills outside of the familiar setting. Because of this, naturalistic teaching strategies are essential to promote success. Naturalistic teaching strategies promote generalization by providing

students with learning opportunities in a more natural way. Although these activities are intended to appear natural and non-scripted, they are not haphazardly planned. They are carefully planned and intentional. Often they require some manipulation of the environment to attain this natural element.

Multiple strategies are required to promote successful naturalistic teaching. Facilitators may use incidental teaching, a strategy that requires arranging the environment in a way that is fun and interesting for the children. This encourages the children to interact with items or activities they find interesting. Facilitators may then intervene and encourage more complex behaviors. Time-delay prompts are intended to teach the child to respond without the use of additional prompts. The facilitator may place a desired item in front of the child while simply giving an expectant look. They then wait for the child to respond appropriately without the use of additional verbal or visual prompts. A further method of naturalistic teaching may involve purposefully interrupting chains and routines. This method should only be used with a well-established routine. By withholding a desired (or necessary) item or making a "silly" mistake, the child may learn to appropriately handle unplanned interruptions or deviations from the typical schedule.

Strategies for Teaching based on Autism Research (STAR)

The STAR program found its beginnings in 1973 when Dr. Arick and Dr. Krug began to work with children with autism. They developed a program that has been used to teach children with autism for over 20 years. The program used the strategies of discrete trial teaching, augmentative systems of communication, and teaching independence. At the request of several school districts, Dr. Arick began working with

Lauren Loos, MS, and Dr. Ruth Franco to develop the STAR program in 1997. (STAR

Autism Support, 2013)

The Curriculum

      The STAR program is based on methods of discrete trial training, pivotal

response training (PRT), and teaching functional routines.

      The discrete trial training in the STAR program is similar to the ABA based

techniques found at the Pingree Center, the ASSERT model, and the LEAP model. Skills

are taught in a logical sequence. Each skill builds on skills that were learned previously.

Each skill is broken down into smaller steps for instruction. Each trial is made up of a

four-step sequence: 1) instructional cue, 2) child response, 3) consequence (generally a

positive reinforcer), and 4) pause for the child to respond.

      The PRT is also based on the four-step sequence (cue, response, consequence,

pause). However, in PRT, the child chooses the activity and the reinforcer is simply a

natural consequence of the behavior. In this way, the activities the child performs are

incorporated into the environment in a functional way. This allows for generalization by

giving the child opportunities throughout the day across various situations to practice

target skills.

      In teaching functional routines, children are taught routines that are purposeful for

the child. Some examples of functional routines include using the restroom, arriving at

school, and snack time. For typical children, the outcome of the routine is reinforcing in

and of itself. For children with autism, the natural outcome may be reinforcing, but

nevertheless, these skills must often be more formally taught. These functional routines

are so essential for children with autism to learn because they provide a meaningful context for using, generalizing, and maintaining skills.

The STAR program targets 6 key areas: receptive language, expressive language, spontaneous language, functional routines, academics, play, and social skills. Each of these areas can be achieved at three separate levels depending on what is most appropriate for the child and what will best meet their needs.

Level 1 is most appropriate for students who have difficulty following simple commands, have behavior issues when asked to follow simple commands, have little to no language, and may not interact with other students. The purpose of Level 1 tasks is to help students to better understand basic language concepts, begin to use verbal language to express basic desires, follow simple routines such a snack time, and begin to participate in basic constructive play independently.

Level 2 is most appropriate for students who can follow simple commands but have difficulty with two step commands, uses only singles words (or single pictures) to express desires, understands only simple nouns, does not play with other children, and is able to follow simple routines. The purpose of Level 2 is to teach children to follow 2-step commands, use multiple words to make requests, use simple verbs such as "sleeping" or "eating," learn the names of other children, play interactively, identify numbers and letters, learn some simple sight words, and answer "wh" (what, when, where, why) questions.

Level 3 is most appropriate for students who can use two or more words (or picture symbols), have the ability to label objects, identify numbers and letters, identifies a few sight reading words, and follows most classroom routines with a verbal or picture

schedule. The purpose of Level 3 is to help students to expand vocabulary and phrase length, use prepositions and pronouns, read more functional sight words, write with dictation and from memory, read a simple story, tell time and use this skill in combination with their schedule, add and subtract one-digit numbers, follow more complex routines such as computer use and transitioning between various locations, participate in school routines such as PE and music, and play interactively with peers.

A study by Arick et al. (2003) provides evidence for the effectiveness of the STAR program. In this study, 67 preschool children between the ages of two and six underwent the STAR program. The results of the study showed that many of the students made significant progress in the areas of social interaction, expressive speech, and adaptive language concepts as a result of their participation in the STAR program.

Learning Experiences and Alternative Program for Preschoolers and their Parents

(LEAP)

The LEAP model began in 1981 in Pittsburg, PA. By 1983, the model became known as a federally funded program for both children with and without autism between the ages of three and five. At the time, LEAP was one of the only early childhood programs in the country that was committed to inclusive practices for young children with autism. By 1998 an actual LEAP site was created. The site was located in Colorado. It was created as a cooperative effort between the Colorado Department of Education, the University of Colorado, and the Douglas county school district.

The Curriculum

There are three main components to the LEAP curriculum. The first is the integrated preschool. A typical preschool classroom is made up of approximately 15

children and three adults. A LEAP classroom is much more similar to a typical preschool classroom than a classroom found in the Pingree Center or ASSERT program. However, a LEAP classroom does require some additional components not found in a general preschool classroom. These may include more visual props, visual schedules, the use of concrete materials, and the use of augmentative systems for communications (such as PECS). A LEAP classroom is divided up into very clear interest areas such as blocks, dramatic play, or table toys. Each of these interest areas will be clearly labeled with some type of visual prompt. Additionally, a classroom schedule is posted at the front of the classroom. The schedule is photographic so that all the children can read the schedule. As LEAP takes place in an inclusive classroom, the curriculum works best when combined with a curriculum to be used in a general preschool that focuses on general skills for preschool children, such as recalling a sequence of events, identifying the functional use of an object, and sharing toys. The goals on each child's individualized education plan (IEP) should also be addressed, provided they have an IEP.

Like the ASSERT program, the LEAP program also utilizes naturalistic teaching methods and ABA methods of teaching. However, the LEAP program additionally employs developmental learning traditions, which are educational methods that promote children's self-initiated learning. ABA methods are utilized to teach the children skills, but rather than only have these skills practiced in isolation, the program teaches skills that embed engagement while supporting generalization. This is most apparent in the social skills portion of the curriculum, which will be discussed later.

The second component of LEAP is the family involvement program for parents. Families may complete a parenting program designed to teach the basic principles of

behavior management and effective strategies for teaching young children. This program includes topics such as the ABC's of behavior, teaching children to follow directions, understanding reinforcement, how to teach children new skills, and how to teach children to communicate.

The third component of the LEAP program is national outreach training activities. Services offered by the outreach staff include various in-service topics, on-site classroom consultation, and training at the LEAP model classroom site. Training topics focus on the following key areas: child assessment activities, developing IEP's, instructional programming for the integrated classroom, behavior management, classroom organization, planning social skills, transition planning, parent involvement, and behavior skills for training parents.

There have been research studies supporting the effectiveness of this model. A study by Strain and Bovey II (2011) sought to determine effectiveness of the LEAP program. Sixteen school districts were recruited for the study across seven states. This widespread recruitment was intended to reduce external validity issues. Out of these 16 school districts, 27 classrooms from a variety of geographical settings (urban, rural, suburban, etc.) implemented the LEAP intervention, and 23 classrooms which did not use the LEAP program served as a comparison group. Teachers in the LEAP classrooms were coached on how to properly implement the LEAP program in the classroom, and this coaching (as well as the study itself) lasted for two years. At the end of this two year period, results of the study indicated that the children in the LEAP classrooms made significantly more progress than the children in the comparison group on measures of cognition, language, autism symptoms, problem behaviors, and social skills.

An additional research study by Strain and Hoyson (2000) followed the progress

of six participants of the LEAP program in a longitudinal study. All of the children met

criteria for autism based on the DSM-III (which was the current edition at the time), and

all of the children were between the ages of two and four when they began the

intervention and participated for two years. Data was then taken when they reached the

age of ten. At this age, none of the children met criteria for an autism spectrum disorder,

all of the children made substantial gains in their developmental functioning and

appropriate behavior, and upon completion of the LEAP program, five of the six children

remained in general education classrooms with no special education placements.

LEAP is almost entirely designed to promote inclusion of children with autism.

One of the main ways LEAP achieves this is by teaching social skills to all of the

children and helping them to generalize these skills. The social skills curriculum is one of

the key elements of the LEAP model.

Social Skills.

There are five topics included in the social skills curriculum: getting a friend's

attention, giving toys, requesting toys, play organization ("You can be the mommy, and

I'll be the baby."), and giving a compliment. In order to teach the skill, the teacher first

describes the skill. The teacher then demonstrates the "right" way as well as the "wrong"

way to perform the skill. The teacher then invites a student to practice modeling the skill

with the teacher in front of the class. Then, two children are called upon to practice the

skill with each other in front of the class. The children then receive reinforcement for

practicing the skill. The children may receive a "super star" (this can be a sticker or a

paper star attached to a string to wear all day) for practicing the skill in a clear on-set and

off-set discrete trial, but they also have opportunities to receive super stars all day as

they practice the target skill in the natural classroom environment. The super stars may be

exchanged at the end of the day for tangible reinforcements.

Multiple strategies are implemented in order to facilitate social interactions. The

environment itself may be structured to promote peer interactions by limiting play

materials (forcing students to share toys) and structuring thematic play activities. The

dramatic play area may be a bakery or the blocks area may be a construction site.

Additionally, teachers may provide cues by paying attention to opportunities for

appropriate social interactions between students. When these opportunities arise, the

teacher may prompt the student to practice the learned social skill. The promise of a super

star for practicing their social skills can also provide great reinforcement that facilitates

social interactions, especially as they are visually displayed all day.

Another method that LEAP utilizes to promote social interactions is the family-

style snack. Rather than the teachers distributing snack to each individual child, multiple

children are appointed the position of "snack captain." The snack captains are in charge

of distributing the snacks. This promotes social interaction among the children by

removing the teachers from the snack situation and giving the children more

opportunities to interact with each other. Teachers may still facilitate social exchanges

and point out opportunities for the children to ask for more snack or request help.

Play and Language for Autistic Youngsters (PLAY)

The PLAY project is a unique intervention geared towards children with autism

age 15 months to six years old. The project was founded in 2001 by Dr. Richard

Solomon, MD. Dr. Solomon started this project in Ann Arbor, Michigan, as a response to

the extreme lack of intensive services for children with autism. Despite this program's

lack of ABA style techniques, Dr. Solomon was greatly exposed to principals of ABA.

Prior to the beginning of PLAY, Dr. Solomon worked closely with Ivar Lovaas in

Pennsylvania providing ABA therapy. Dr. Solomon sought to add a more play based,

social component to these types of intensive services. The PLAY project seeks to address

the core feature of autism, social impairment, by progressively encouraging more

reciprocal social interaction through teaching these children to be appropriately playful.

(The PLAY Project, 2005-2013)

Like RDI, PLAY is not based in principals of ABA. Rather, it is based in

principals of Developmental Individual Differences/Relationship Based (DIR). Instead of

focusing on skills and isolated behaviors, DIR seek to strengthen a child's emotional,

social, and intellectual capacities by building healthy foundations in these areas using

more naturalistic methods (Greenspan, 2007). The "D" describes where the child is at

developmentally. According to DIR, there are six developmental milestones (Greenspan,

2007): self-regulation and shared attention (infants learn to engage in sensory experiences

while being able to calm themselves), engagement (the infant forms attachments to

his/her primary caregivers), two-way communication (the infant learns that when he/she

acts others will react, thus creating a dialogue), complex two-way communication (at this

point, the young child has acquired vocabulary words and has learned to string them

together to articulate more complex ideas), shared meanings and symbolic play (the child

learns that various things can be symbols to express ideas in play or in making requests),

and emotional thinking (the child is fully verbal and is able to understand more complex

topics such as space and time and becomes better able to problem-solve visually and

spatially). The "I" refers to the individual differences found in each child in terms of their

sensory responses to the environment and the way in which they sequence their actions

and ideas. The "R" describes the relation-based portion of the model and how their

relationships with peers and other adults can enable them to make progress socially and

intellectually.

The Curriculum

The P.L.A.Y. program is implemented through home consultation and

professional training programs. Home consultation is essential to teaching the parents to

effectively engage with their children and develop a better connection with their child

through play. Home consultants provide monthly, three hour long visits in which they

model techniques, coach the parent, and provide them with feedback. The international

professional training program is designed to train and prepare professionals to implement

the P.L.A.Y. program in their communities.

There are several skills in the sequence to implementing the P.L.A.Y. project.

First, one must list principals and strategies based on the comfort zone (the activities a

child prefers to do when they are not engaged with others), the sensory profile (the

individual child's sensory issues and challenges), and the functional developmental level

of the child(the developmental stages of DIR). Then, one must assess the child's unique

abilities and limits in terms of these same three areas (comfort zone, sensory profile, and

functional developmental level). Next, it is essential to define daily and weekly

curriculum activities. These may include things such as gently shaking the child's arms

and legs, swinging the child in a blanket, tickling them, or blowing on their skin. For

cognitively higher children, these may include activities such as puzzles, blowing

bubbles, playing with a ball, or finger paint. It is important to remember that this program

is child centered. This means that after designing activities, it is essential to follow the

child's lead. Pay attention to the child's cues and what they would like to become

engaged in. A menu of specific techniques to help the child engage in play activities

should then be created for the facilitator, whether it is a parent or a professional. These

may be as simple as simply being with the child or waiting for the child to play. After

activities and techniques to promote play have been decided, the interaction should be

critically reviewed (they may be videotaped) in order to determine if the child is making

progress. Following this review, curriculum materials and techniques may be refined in

order to yield more effective results.

        A study conducted in 2007 by Solomon, Necheles, Ferch, and Bruckman assessed

the effectiveness of the PLAY project. Sixty-eight children with an autism spectrum

disorder were assessed prior and post participation in the PLAY project. Clinical ratings

by home consultants indicated that 66 percent of these children made very good

developmental gains. These statistics were highly significant, providing evidence that this

model may be an effective program for helping children with autism to make important

developmental progress. Additionally, this study estimated that the average cost of this

intervention per year is $2500, which is incredibly inexpensive compared to other

interventions carried out by professionals that can cost between $25,000 and $60,000 per

year.

        Floortime.

        Developed in the 1980's by Dr. Stanley Greenspan, Floortime is a therapeutic

technique which incorporates play activities, often on the floor. Floortime is an essential

element of the PLAY program. Facilitators meet the child at whatever developmental

level they are at and then build upon their strengths. The therapy dictates that the child

exhibit "circles of communication" (Stacey, 2003). These circles are started when

someone attempts to communicate or engage with the child. The circle is completed

when the child elicits a response. The adult smiles at the child and the child smiles back.

This would be considered a complete circle.

Relationship Development Intervention (RDI)

The RDI was first developed by psychologist Steven Gutstein, PhD. This theory is

built on the idea that "dynamic intelligence," which Dr. Gutstein would define as the

ability to think flexibly (this includes appreciating different perspectives, coping with

change, and integrating information from multiple sources), is essential to improving an

individual with autism's quality of life. The primary aim of RDI is to help individuals

with autism build their personal relationships by gradually strengthening their building

blocks of social connections, including their ability to bond emotionally with another

person as well as share experiences with others.

RDI is based on the idea that children with autism missed certain developmental

milestones as infants and toddlers that are linked to typical social development. By

teaching them to play appropriately and build relationships, they can be given a second

chance to reach these essential stages of development.

The Curriculum

RDI is a cognitive-developmental treatment program that teaches parents to help

their child succeed in meaningful, give-and-take relationships while addressing other

issues such as motivation, communication, emotional regulation, episodic memory, rapid

attention shifting, self-awareness, appraisal, executive functioning, flexible thinking, and

problem solving. There are six main objectives to the RDI curriculum:

1) Emotional referencing: The ability to learn from the emotional and

   subjective experiences of others

2) Social coordination: The ability to observe and control behavior to successfully

   participate in social relationships

3) Declarative language: The ability to use language and non-verbal

   communication to express curiosity, invite interactions, share perceptions and

   feelings and coordinate with others

4) Flexible thinking: The ability to adapt and alter plans as circumstances change

5) Relational information processing: The ability to put things into context and

   solve problems that lack clear cut solutions

6) Foresight and hindsight: The ability to anticipate future possibilities based on

   past experiences

There are three levels to the RDI curriculum, with various stages within each level

(Gutstein & Sheely, 2002). Level 1 is considered the "novice" level. At this point, they

do not do very much of the work regarding relationship encounters. They are merely

learning to make adults the center of their attention. They learn to use other people as

references for their own behavior, a skill known as social referencing. There are four

stages that they must master within this first level: attend, reference, regulate, and

coordinate. The first stage, attend, is intended to decrease or eliminate the amount of

prompting needed to gain a child's attention. At the reference stage, children will learn to

use people as their primary reference point for how they are to interact with the world. At

the regulate stage, the child will learn to reference their coach (or teacher) when learning to build effective relationships. In the final stage, coordinate, the child will learn to coordinate actions with a social partner.

At Level 2 they are considered an "apprentice" and must now learn to engage in shared communication and regulation by working with a partnered peer. They will also learn to enjoy variation and rapid transition. There are four stages within Level 2: variation, transformation, synchronization, and duet. At the variation stage, it is intended that children will gain a greater understanding of change in that it is constantly occurring in small segments as opposed to a more black and white view of change. In the transformation stage, children will learn to enjoy novelty and unpredictability by learning that an activity can change or be altered completely (for example, the game "follow the leader"). In the synchronization stage, the child learns to become a partner in more complex coordinated actions (like in the game "ring around the rosies"). By the final stage, duet, the child will have mastered these skills with an adult guide and is now ready to learn these skills with a peer.

At Level 3, the final level, they are considered a "challenger" and learn to enjoy co-creation and improvisation. They will learn to accomplish tasks with a group rather than on their own. There are four final stages within Level 3: collaboration, co-creation, improvisation, and running mates. By the collaboration stage, the adult guide acts more as a moderator while the child interacts with another peer and learns to alter his/her actions based on their peers' reactions. In the co-creation stage, the child along with the peer partner will enjoy producing something that could only be created as a result of their collaboration. By the improvisation stage, the child has a deep understanding of change

and is ready to function in real life play or social settings where conversations and

activities are constantly transforming. By the final stage entitled running mates, the child

will have a more advanced perception of relationships and will understand that he/she

must act in a way that is appealing to peers.

       In 2007, a study was released by Gutstein, Burgess, and Montforth evaluating the

effectiveness of the RDI intervention. In this study, the progress of 16 children who

participated in the RDI intervention between the years 2000 and 2005 was evaluated.

Prior to the study, all of the children met criteria for autism based on the autism

diagnostic observation schedule (ADOS). At a follow-up period of 30 months following

their participation in the RDI intervention, no child met criteria for autism based on the

ADOS. An article written by Dr. Gutstein entitled "Raising the Bar with RDI" makes

additional claims for the success of the RDI intervention. According to Dr. Gutstein,

parents report dramatic changes in their children, including increased interest in how their

parents and other family members feel, a significant decrease in stressful behaviors, and

more hope for the future. Dr. Gutstein also claims that after two and a half years of

participating in the RDI intervention, less than 15 percent of the children were in special

education placements (as opposed to 90 percent prior to the intervention).

Unique Components of RDI.

       RDI is a very cost effective program. The yearly treatment costs of RDI are

approximately $1/5^{th}$ of the cost of one-on-one traditional behavior intervention program

(Responding to Autism Services, Inc., 2010). Parents are trained to carry out much of this

intervention. As soon as the parents are able to provide their children with effective

guides, there is little need for secondary support staff.

Besides the cost-effectiveness of RDI, the program is also very broad in its scope of treatment (Gutstein & Sheely, 2002). It can be used with very low functioning children all the way to very high functioning children. Additionally, this program is not restricted to an age range. It can be used with young children as well as adolescents. The RDI program is also not only restricted to children with autism. This program may be used with any population experiencing social problems, including individuals with ADHD, Bi-Polar Disorder, Tourette Syndrome, or any learning disorder.

Conclusions

Division 12 of the American Psychological Association (APA) has outlined standards by which a treatment may be considered well established:

1) Treatment groups should be randomly assigned.

2) There must be at least two well-conducted group-design studies, conducted by different research teams to show that the treatment was either a) superior to a placebo or alternative treatment or b) equivalent to an already established treatment.

3) If the criteria for number 2 cannot be met, there must be a large series of single design case studies that a) use good experimental design and b) compare the intervention to another treatment.

4) The treatment must be manualized.

5) The characteristics of the sample must be clearly defined.

The APA has also outlined criteria under which a treatment may be considered probably efficacious:

1) There must be two studies showing that the intervention is more effective than a no-treatment control group.

2) If the first criteria cannot be me, there may be two group-design studies meeting the criteria for a well-established treatment, but conducted by the same research team.

3) If criteria for the first two cannot be met, there must be a small series (at least 3) of single-subject case design experiments that meet criterion 3 for well-established treatments.

4) The treatment must be manualized.

5) The characteristics of the sample must be clearly defined. (Gresham, Beebe-Frankenberger, & MacMillan, 1999)

The APA is not the only group that has created a set of standards by which we may evaluate treatments. The National Autism Center initiated a National Standards Project to provide strength of evidence for common treatments, describe the age/diagnosis/skills or behavior that specific treatments are designed to target, identify limitations in the current available research, and offer recommendations for best practices when working with students with autism. The National Standards Project has identified four factors for evidence based practice:

1) Research findings- Treatments should be seriously considered if they can be considered Established Treatments because we can reasonably assume that a) the treatment produces favorable effects and b) they are not ineffective or harmful in any way. However, treatments that are not as established in the research may be considered based on the other three criteria.

2) Professional judgment- The judgment of individuals who are experts in

   Autism Spectrum Disorders (ASD) must be taken into account despite what

   research dictates. This may be important in cases where an Established

   treatment was correctly implemented but had harmful side effects, an

   Established treatment is inappropriate for a specific child based on extraneous

   factors, treatments beyond the ASD literature may be appropriate to use (i.e.

   treatments for depression or anxiety), or the professional is aware of studies

   that were carried out after the creation of the National Standards Report.

3) Values and preferences- The values and preferences of parents, care providers,

   and individuals with autism should be respected. These may play into the

   decision of whether or not to use a treatment when a particular treatment was

   correctly implemented in the past but was harmful, a treatment is contrary to

   the values of the family, or the individual with autism indicates that he or she

   does not want a particular treatment.

4) Capacity- Treatment providers should be in a position to administered

   treatment correctly and successfully, with the proper training, resources, and

   feedback. This may play a particularly important role in the decision making

   process when a treatment has never been implemented before and is quite

   complex, a professional providing the treatment has a lot of knowledge about

   the treatment but little knowledge of the technique required to deliver it, or a

   treatment has been used for year but without any feedback as to whether or

   not it is being implemented correctly. (National Autism Center, 2009)

The ABA based programs included in this review are the Carmen B. Pingree Center for Children with Autism, ASSERT, LEAP, and STAR. The non-ABA based programs included RDI and the PLAY project. Each of these programs have been built on an abundance of research strongly supporting aspects of the program (ABA techniques, discrete trial training, PECS, preference assessments, naturalistic teaching strategies, etc.). The LEAP program, STAR, RDI, and the PLAY projects are even backed up by research specifically evaluating that particular program. Although much research has indicated that children who undergo these programs experience success, they may not quite meet the APA's standards for well-established treatments. In order for a study to be considered well-established, subjects must be randomly assigned. Studies evaluating these programs and techniques are made up of subjects from established classrooms or units. This makes these experiments quasi-experimental and not truly randomized. Additionally, the majority of the studies, although indicating significant results, did not include no-treatment control groups. Rather, the experimental groups were compared to themselves pre- and post-treatment, causing them to fail to meet criteria for even probably efficacious.

Despite methodological weaknesses based on the APA's standards for research, these programs should not be dismissed as ineffective. Many of these weaknesses are simply due to issues of convenience (it is more convenient to study an entire classroom rather than individual children from multiple classrooms) and the ethics of randomization (it may be considered unethical to assign a child with autism to no-treatment control group where they will not get the help they need and will waste valuable time receiving no treatment).

The effectiveness of these programs may also be evaluated based on the National Standards Report developed by the National Autism Center in 2009. According to these standards, programs may be evaluated based on research, professional judgment, values and preferences, and capacity. In the case of all of the models, research has indicated that these treatments produce favorable effects and do not cause harm. Professional may judge on a case-by-case basis whether or not the program is effective for a particular student and if they should be moved to a more appropriate placement. However, each of these programs has been widely used across the state of Utah for many years, and therefore, it may be reasonably assumed that professionals generally support these programs. Values and preferences, like professional judgment, must also be taken into account on a case by case basis and decided by the parents. Finally, a program may be evaluated in terms of the school's or treatment center's capacity to successfully implement the treatment. Many of these treatments may be costly, particularly if they require a low staff to student ratio. However, given that the financial resources are available, each of these treatments are manualized and include a professional development component in which training to staff and parents is available, making it possible for each of these programs to be carried out with fidelity.

The National Standards Project also indicates whether specific treatments are Established, Emerging, Unestablished, or Ineffective or Harmful. Professionals and parents should generally aim to provide children with treatments that are Established. There are many components of these programs that are considered by the National Standards Project to be Established including modeling (all programs), naturalistic teaching strategies (ASSERT, LEAP, RDI, PLAY), peer training (LEAP, RDI), pivotal

response treatment (Pingree, ASSERT, STAR), and schedules (Pingree, ASSERT, LEAP). Treatments that are considered Emerging may also be appropriate to use with students with autism. These include augmentative/alternative communication (Pingree, ASSERT), developmental relationship-based treatment (RDI, PLAY), language training (Pingree, ASSERT, STAR), PECS (Pingree, ASSERT), and social skills (LEAP, RDI, PLAY).

Each of these models contains elements that overlap with each other. Dawson and Osterling (1997) described several components that a comprehensive program generally has in its curriculum. These include teaching children to selectively attend to certain stimuli, the ability to imitate motor and vocal behaviors, receptive and expressive language, how to play with toys appropriately, and social interaction skills. None of these programs would deny that each of these areas contain skills in which children with autism are lacking. However, the programs differ in which elements are emphasized. Pingree and ASSERT are very concerned with a child's ability to attend to specific stimuli, imitate behaviors, and learn language, while programs such as PLAY may be more concerned with learning to appropriately play with toys and interact socially. In any case, no two children with autism are exactly the same, and every child may respond favorably to one intervention and fail at another. When selecting an appropriate intervention, professionals and parents must perform careful observation and employ data taking techniques in order to determine which program may aide each individual child to reach their maximum potential.

References

Arick, J.R., Young, H.E., Falco, R.A., Loos, L.M., Krug, D.A., Gense, M.H., & Johnson,

      S.B. (2003). Designing an outcome study to monitor the progress of students with

      autism spectrum disorders. *Focus on Autism and Other Developmental*

      Disabilities, 18, 75-87.

Autism Speaks. (2013). *Training and education of autistic and related communication of*

      handicapped children (TEACCH). Retrieved from

      http://www.autismspeaks.org/what-autism/treatment/training-and-education-

      autistic-and-related-communication-handicapped-children.

Autism Web. (2000-2013). *Autism teaching methods: TEACCH (treatment and education*

      of autistic and related communication of handicapped children). Retrieved from

      http://www.autismweb.com/teacch.htm.

Bondy, A.S. & Frost, L.A. (1994). The picture exchange communication system. *Focus*

      on Autism and Other Developmental Disabilities, 9, 1-20.

Centers for Disease Control and Prevention. (2008). *Autism spectrum disorders (ASD's):*

      Data and statistics. Retrieved from http://www.cdc.gov/ncbddd/autism/data.html

Centers for Disease Control and Prevention. (2008). *Utah autism developmental*

      disabilities and monitoring project (UT-ADDM). Retrieved from

      http://www.cdc.gov/ncbddd/autism/states/addm-utah-fact-sheet.pdf

Center for Persons with Disabilities at Utah State University. (n.d.). *Autism support*

      services: Education, training, and research. Retrieved from

      http://www.cpdusu.org/projects/assert/#content.

Charlop-Christy, M.H., Carpenter, M., Le, L., LeBlanc, L.A., & Kellet, K. (2002). Using

    the picture exchange communication system (PECS) with children with autism:

    Assessment of PECS acquisition, speech, social-communicative behavior, and

    problem behavior. *Journal of Applied Behavioral Analysis, 35,* 213-231.

Dawson, G. & Osterling, J. (1997). Early intervention in autism. In M. Guralnick (Ed.)

    The effectiveness of early intervention, (pp. 307-326). Baltimore: Brookes.

Eikeseth, S., Smith, T., Jahr, E., & Eldevik, S. (2002) Intensive behavioral treatment at

    school for 4- to 7- year old children with autism: A 1-year comparison controlled

    study. *Behavior Modification, 26,* 49-68.

Eldevik, S., Hastings, R.P., Hughes, J.C., Jahr, E., Eikeseth, S., & Cross, S. (2009). Meta-

    analysis of early intensive behavioral intervention for children with autism.

    Journal of Clinical Child and Adolescent Psychology, 38, 439-450.

Greenspan, S. (2007). *DIR, floortime, and DIRfloortime.* Retrieved from

    http://www.icdl.com/dirFloortime/overview/.

Gresham, F.M., Beebe-Frankenberger, M.E., & MacMillan, D.L. (1999). A selective

    review of treatments for children with autism: Description and methodological

    considerations. *School Psychology Review*, *28,* 559-575.

Gutstein, S.E. *Raising the bar with RDI.* Retrieved from

    http://www.respondingtoautism.net/RaisingtheBarwithRDI.pdf

Gutstein, S.E. & Sheely, R.K. (2002). *Relationship development intervention with young*

    children: Social and emotional development activities for Asperger's syndrome,

    autism, PDD, and NLD. United Kingdom: Jessica Kingsley Publishers.

Gutstein, S.E., Burgess, A.F., & Montfort, K. (2007). Evaluation of the relationship

     development intervention program. *Autism, 11,* 397-411.

National Autism Center. (2009). *National standards report: The National Standards*

     Project- Addressing the need for evidence based practice guidelines for autism

     spectrum disorders. Massachusetts.

Responding to Autism Services, Inc. (2010). *Relationship development intervention.*

     Retrieved from: http://www.respondingtoautism.net/RDI.html.

Sallows, G.O. & Graupner, T.D. (2005). Intensive behavioral treatment for children with

     autism: Four-year outcome and predictors. *American Journal on Mental*

     Retardation, 110, 417-438.

Smith, T., Groen, A.D., & Wynn, J.W. (2001). Erratum. *American Journal on Mental*

     Retardation, 106, 208.

Solomon, R., Necheles, J., Ferch, C., & Bruckman, D. (2007). Pilot study of a parent

     training program for young children with autism. *Autism, 11,* 205-224.

Stacey, P. (2003, January/February). Floor Time. *The Atlantic Monthly,* 127-134.

Strain, P.S. & Bovey II, E.H. (2011). Randomized control trial of the LEAP model of

     early intervention for young children with autism spectrum disorders. *Topics in*

     Early Childhood Special Education, 31, 133-154.

Strain, P.S. & Hoyson, M. (2000). The need for longitudinal, intensive social skills

     interventions: LEAP follow-up outcomes for children with autism. *Topics in*

     Early Childhood Special Education, 20, 116-122.

STAR Autism Support. (2013). *STAR autism program: A research-based ABA*

     curriculum. Retrieved from: http://starautismsupport.com/star-autism-program.

The PLAY Project. (2005-2013). *About the PLAY project.* Retrieved from:

http://www.playproject.org/.

Valley Mental Health. (n.d.) *Carmen B. Pingree center for children with autism.*

Retrieved from http://www.carmenbpingree.com/.