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**Increasing Appropriate Social Communication and Pragmatic Language Skills in
Young Adults with Autism Spectrum Disorders**

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by

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Report

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Abstract

Increasing Appropriate Social Communication and Pragmatic Language Skills in Young Adults with Autism Spectrum Disorders

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This report seeks to explore intervention methodologies that can be adapted for use with young transitional adults with Autism Spectrum Disorders (ASD) to increase appropriate social communication. No interventions have been developed explicitly for use in speech-language therapy with young adults with ASD. As a result, existing interventions have to be adapted to use with this population. The interventions that were adapted were Behavioral Interventions, Developmental Social Pragmatic Interventions, and Enhanced Milieu Teaching. The adaptations of the reviewed interventions were illustrated by creating an instructional video to highlight how to use the interventions and their adaptations with an adult with ASD. The author and participant consider the video development and final product to be a success; however, until peer-reviewed efficacy studies that explore the effects of these intervention adaptations with young-adults with ASD are conducted, the author cannot assert that the intervention adaptations discussed will be effective therapy strategies for young adults with ASD.

Table of Contents

List of Tables	vii
CHAPTER 1.....	1
LITERATURE REVIEW	1
Introduction	1
Medical Definition	2
Educational, Family, and Employment Outcomes	5
Theories and Implementation of Interventions	6
Behavioral Intervention (BI)	7
Efficacy of BI.....	9
Developmental Social-Pragmatic Interventions (DSPI)	16
Efficacy of DSPI	17
Enhanced Milieu Teaching (EMT)	22
Efficacy of EMT	24
Adaptation of Intervention Techniques.....	29
Overview of Approaches.....	30
CHAPTER 2.....	33
METHODS	33
Participant	33
Developmental History	33
Educational History.....	34
Social History	34
Employment History	35
Medical History	35
Intervention and Intervention Goals	36
Creation of the Video/Technique Illustration Procedures	37
Setting	37

Procedures for Recording the Video	38
CHAPTER 3.....	39
RESULTS	39
Video Outcomes	39
Technique Illustration Outcomes	39
Video Structure	40
CHAPTER 4.....	43
DISCUSSION	43
Clinician-Participant Outcomes	44
Critique	45
Future Research	45
Conclusions	46
APPENDIX	48
BIBLIOGRAPHY	49

List of Tables

Table 1. Definition of Autism Spectrum Disorders.	3
Table 2. Definition of Terms for Behavioral Intervention.	13
Table 3. Definition of Terms for Developmental Social-Pragmatic Intervention.	22
Table 4. Definition of Terms for Enhanced Milieu Teaching.	27
Table 5. Overview of Approaches.	30

CHAPTER 1

LITERATURE REVIEW

Introduction

Young adults with Autism Spectrum Disorders (ASD) may persist in having struggles with social relationships into adult life. They may need specific interventions that can be used to increase appropriate social communication and increase appropriate pragmatic language skills (Ingersoll, Meyer, Botner, Jelinek, 2012, Hancock & Kaiser, 2002). Lack of these skills may contribute to ongoing challenges, difficulty in making social connections and in employment settings. Speech Language Pathologists (SLPs), guided by the American Speech-Language Hearing Association Scope of Practice document, treat the social-communication and pragmatic language difficulties that people with ASD display (Scope of Practice, 2007). As such, SLPs must choose a method of intervention that is based in current research and clinical evidence to ensure the best quality of care is being given to their clients (Introduction to Evidence-Based Practice, 2004). However, research into interventions that may be effective in combating these social-communication or pragmatic language issues are not widely available, especially among young adults as they move from school and family support systems into adulthood. Even further, there are not many interventions that focus on the development of pragmatic language skills (language, such as body language, that is meant to communicate extra information beyond expressive (spoken) or receptive (understood language) for young adults or children with ASD: many interventions for people with

ASD, especially young children, tend to focus on expressive language output or receptive language growth. If not many intervention descriptions or efficacy studies focus on this population or this area of language, then SLPs do not have the evidence-based rationale or instruction necessary to give any transitional autistic young adults in their caseload the most beneficial therapy, especially when it comes to their client's social communication concerns. The goal of this review is to address this information gap by evaluating intervention methodologies that have been used with young adults with ASD, or interventions for younger children with ASD that might be adapted to young adults.

A definition of ASD must be established, and demographic information on the population must be incorporated to better understand this young adult population. For the purposes of this report, young adults will be classified as any person with ASD who is between 12 and 25 years of age, or middle-school, high-school, or college-aged individuals with ASD.

MEDICAL DEFINITION

ASD, as it is as defined by the American Psychiatric Association (American Psychiatric Association, 2013) within the Diagnostic Statistical Manual Fifth Edition is divided into four parts.

Table 1. Definition of Autism Spectrum Disorders.

Definition Part	Definition (American Psychiatric Association, 2013)
1.	<ul style="list-style-type: none"> ● persistent deficits in social-communication and social interactions across contexts, not accounted for by general developmental delays, and manifested by 3 of 3 symptoms: <ul style="list-style-type: none"> ○ 1. Deficits in social-emotional reciprocity; ranging from abnormal social approach and failure of normal back and forth conversation through reduced sharing of interests, emotions, and affect and response to total lack of initiation of social interaction. ○ 2. deficits in nonverbal communicative behaviors used for social interaction; ranging from poorly integrated verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures. ○ 3. Deficits in developing and maintaining relationships, appropriate to developmental level (beyond those with caregivers); ranging from difficulties adjusting behavior to suit different social contexts through difficulties in sharing imaginative play and in making friends to an apparent absence of interest in people.)
2.	<ul style="list-style-type: none"> ● restrictive, repetitive patterns of behavior, interests, or activities as manifested by at least 2 of 4 symptoms <ul style="list-style-type: none"> ○ 1. Stereotyped or repetitive speech, motor movements, or use of objects; (such as simple motor stereotypes, echolalia, repetitive use of objects, or idiosyncratic phrases). ○ 2. Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change; (such as motoric rituals, insistence on same route or food, repetitive questioning or extreme distress at small changes). ○ 3. Highly restricted, fixated interests that are abnormal in intensity or focus; (such as strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests). ○ 4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment; (such as apparent indifference to pain/heat/cold, adverse response to specific sounds or textures, excessive smelling or touching of objects, fascination with lights or spinning objects).

Table 1. Definition of Autism Spectrum Disorders Continued.

3.	<ul style="list-style-type: none"> ● symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities).
4.	<ul style="list-style-type: none"> ● symptoms together limit and impair everyday functioning.

There is currently no demographic data outlining the prevalence of ASD in young adults. The Center for Disease Control's Autism and Developmental Disabilities Monitoring (ADDM) Network (Baio, 2010), the largest ASD monitoring network in the United States, has compiled data on 8 years old children. Their analysis reveals that in 2010, the incidence of ASD within 11 states of the United States was 1 in 68 children aged eight years old. Males were found to be five times more likely to be diagnosed with ASD than females. Almost half, 46%, of children identified with ASD, had average or above average intellectual ability ($IQ > 85$), and 44% of the children identified with ASD were evaluated for developmental concerns by the time they were 3 years old. On average, children identified with ASD were not diagnosed until after age 4, even though children can be diagnosed as early as age 2. In this data analysis, about 80% of the children identified with ASD had special education eligibility for ASD at school or a formal diagnosis from a clinician (Baio, 2010). While information regarding younger children gives some indication of the prevalence of ASD, there is a gap in the information available regarding young adults with ASD. Demographic information for the specific population of young adults is not readily available. At present, treatment for these young people occurs within private clinics, homes, and school-districts all across the United States (Baio, 2010).

Though medical definitions and symptoms of ASD are available, and can apply across all age-groups affected by the disorder, these definitions do not include specific details regarding the behaviors, sensory issues, and pragmatic language difficulties that may also be found in young adults with autism. This medical and demographic information also does not mention the specific challenges that young transitional adults with autism face, such as educational difficulties, family issues, and employment opportunities.

EDUCATIONAL, FAMILY, AND EMPLOYMENT OUTCOMES

Understanding the broader context of issues faced by young adults with autism is a critical piece of the information necessary to plan successful interventions. In 2007, Eaves and Ho developed a survey designed to measure outcomes of the lives of children and adolescents with ASD (Eaves & Ho, 2007). They contacted by mail families with children born from 1974 to 1984 who were diagnosed with ASD as preschoolers and who were followed into adolescence. Of 76 families that were eligible, 48 (63%) participated in a telephone interview. The 1974-1984 time period was selected because the authors wished to compare outcomes measured from people with ASD in the 50's and 60's with children born in the 70's and 80's to compare improvement of outcomes. They found that, all children and adolescents completed elementary school. The authors also report that the participants finished school (did not specify how many participants dropped out or graduated) at a mean age of 18 years and a range of 13–21. In high school, 69% of the participants were in special classes and 77% had aides that helped facilitate their needs within a classroom setting. 21% of the participants were seeing a speech language

pathologist and 40% were seeing a school counselor (the study did not mention how regularly the participants saw either the SLP or counselor). Estimates of academic achievement indicated 33% of the participants could not read, but 23% of the participants did read at a grade 9–13 level. 35% of the participants had no writing skills and 13% were at a high school level of writing ability. Relative to math skill levels, 42% of the participants could not do any math at all, while 20% were at or above Grade 9 in their math ability. Almost 30% of the participants attended post-secondary schools, with only one participant reported to be at a university. None had yet received a certificate of completion or degree (Eaves & Ho, 2007, pg. 743).

As for family issues and employment, Eaves and Ho stated that 30% of parents interviewed stated that their primary concern for their child was their lack of social outlets. Their concern was fostered by the fact that 56% of participants lived with their parents and 35% were in settings such as group homes, foster care or a home managed by the participant's care team. Only four participants lived independently, and 79% were receiving government assistance in the form of a pension and a social worker (Eaves & Ho, 2007). Only 56% of the participants had ever been employed. Most were employed in volunteer, sheltered, or part time work averaging 5 hours a week. Two participants worked independently, and only one participant supported himself (Eaves & Ho, 2007).

Theories and Implementation of Interventions

Due to the lack of demographic data and the persisting challenges that young adults with ASD face, information regarding how to offer the most beneficial and

evidence-based interventions for this population must be explored. Three theoretical perspectives on interventions for ASD have been selected for review that show promise for adaptation not only in terms of adapting the interventions from use with young children to young adults, but that also show promise for adaptation from focusing on expressive language output/receptive language gains to focuses on pragmatic language and social communication. The goal of this review is to support SLPs in developing therapy regimens for this population.

The interventions selected are Naturalistic Behavioral Intervention (Lovaas, 1987), Developmental Social-Pragmatic Intervention (Prizant, Wetherby, & Rydell, 2000), and Enhanced Milieu Teaching (Hancock & Kaiser, 2002). Each will be reviewed below related to history of their development, specific procedures, efficacy of treatment, and adaptations of these interventions for other disordered populations that can be compared to treatments for young adults with ASD. Table 5 gives an overview of these interventions.

BEHAVIORAL INTERVENTION (BI)

BI (Lovaas, 1987) is based on the application of learning theory: operant behaviors, behaviors under an individual's direct control, are learned through interactions with the people in the individual's environment and the environment itself (Ingersoll, 2010). This intervention was developed by B.F. Skinner in the 1930's, though the first researcher to study the intensive application and efficacy of BI with people with autism, specifically 2 through 4 year olds, was Ivar Lovaas in 1987 (Lovaas, 1987). He attempted to use the principles of applied behavior analysis to lessen problem behaviors, such as

self-stimulatory behaviors (“prolonged ritualistic, repetitive, and stereotyped behavior”), lack of age-appropriate play behaviors, and lack of expressive vocabulary in his 1987 pilot study (Lovaas, 1987).

Within BI, specific behaviors are targeted and cued by antecedents and then reinforced. Antecedents are defined as the context or situation that precedes a behavior. Appropriate skills can be taught through the manipulation of antecedent variables and the application of reinforcement, defined as the item, context, or action/activity that causes the person to perform the behavior again. BI uses prompting, which is asking the client/allowing the client to imitate the clinician's behavior, or saying a specific phrase to remind the client of the next step to take in an interaction or chained behavior, and reinforcement within natural/functional contexts, which are contexts in which a targeted behavior is most likely to be performed. However, this emphasis on naturalistic contexts within therapy is a development of BI that has developed in contemporary times with researchers such as Ingersoll focusing on naturalistic contexts within extensions of BI like Enhanced Milieu Teaching, which will be discussed later in the literature review: Lovaas and his colleagues conducted intervention in an analog clinical setting (e.g. at a table) rather than a natural context. Their goal was simply for the child to perform the behavior, not to generalize the behavior to a functional or natural context.

While a broad range of adaptive behaviors can be targeted with BI, specific social communication skills, such as maintaining eye-contact, maintaining conversational topics, and making appropriate comments might be one focus of BI for young adults with ASD. Examples of these conversational skills are as follows: making sure that the topics

of the current conversation are appropriate to the current environment that the person is in (not talking about death in public), staying on a conversational topic for an appropriate length of time (not speaking about one topic exclusively), not switching conversational topics too soon (only making one comment before speaking of something else), and making comments that are appropriate for the topic of conversation (not laughing when someone mentions a loss).

The BI approach uses specific teaching tools such as prompting, chaining (linking behaviors together to create a more complex behavior), and fading (gradually taking away prompts as a person masters a behavior). Teaching occurs in the natural environment/context during ongoing interactions between the individuals, usually during daily routines (Ingersoll et. al. 2012). The individual initiates the exchange by indicating interest in an item or activity. The communicative partner prompts the individual to produce the target behavior. The individual's production of the target behavior is reinforced with a preferred item or activity of interest. The communicative partner then shapes the individual's response into a more complex response, reinforcing the attempts to respond.

Efficacy of BI

Three studies have been selected to explore the efficacy of BI as an intervention method for intervention with people with autism. The first study is a pilot study done by Ivar Lovaas in 1987 (Lovaas, 1987). Lovaas selected two groups, a treatment group and a control group, to examine the effects of BI in reducing self-stimulatory behaviors and aggressive behaviors and the effects of BI in increasing the amount of recognizable

words the children produced as well as appropriate play behaviors. The experimental group ($n = 19$) received more than 40 hours of one-to-one treatment per week, the minimal-treatment control group ($n = 19$) received 10 hours or less of one-to-one treatment per week, and control group 2 ($n = 62$) received no treatment at all. All groups were followed for three years. Participants were selected based on the following criteria: (a) a diagnosis of autism from a licensed PhD, (b) chronological age of less than 40 months if mute and less than 46 months if echolalic, and (c) prorated mental age (PMA) of 11 months or more at a CA of 30 months (Lovaas, 1987). The aggressive and self-stimulatory behaviors were reduced by the behaviors being ignored, by the child being put in time-out, by the shaping of alternate, more socially acceptable forms of behavior (these more socially acceptable behaviors were not specified), and, as a last resort, by saying “no” loudly or a slap on the thigh contingent upon the presence of an undesirable behavior.

During the first year of treatment, goals consisted of reducing self-stimulatory and aggressive behaviors, building compliance to simple verbal requests, teaching imitation, modeling appropriate play, and making sure the treatment extended into the family. The second treatment year emphasized teaching expressive and abstract language and to encourage play with peers (Lovaas, 1987). The results of this study were measured by how many IQ points a child gained and whether or not the child had entered mainstream classrooms by the time the study was over. The experimental group showed that 9 children (47%), who also passed first grade in a public school, obtained an average or above average score on IQ tests ($M = 107$, range = 94–120). Eight participants (42%)

passed first grade in pull-out sessions of therapy and obtained a mean IQ score within the mildly retarded range ($M = 70$, range = 56–95). Only two children (10%) were placed in classes for special needs children and scored in the severely retarded range ($IQ < 30$) (Lovaas, 1987). In comparison, only one participant in the control groups gained average scores on IQ tests. As far as variables that increased the likelihood of a favorable outcome, mental age was seen as the most significant factor that influenced the outcome.

Eikeseth, Smith, Jahr, and Eldevik (2007) examined the educational, social, and cognitive outcomes of young boys with ASD. They longitudinally examined the outcomes of children aged 4 years old and compared their outcomes at 4 years old to outcomes at 7 years of age. Participants had to meet 4 criteria: (a) a diagnosis of autism (ICD-10) from the Autism Diagnostic Interview-Revised (Lord, Rutter, & LeCouteur, 1994) and a licensed child clinical psychologist, (b) a chronological age between 4 and 7 years (c) a deviation IQ of 50 or above on the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R; Wechsler, 1989) or a ratio IQ of 50 or above from the Bayley Scales of Infant Development-Revised (Bayley, 1993), and (d) no medical conditions that could interfere with treatment. A director of the team, assigned the children to the two groups: (a) a behavioral (ABA) treatment ($n = 13$, 8 boys), or (b) an eclectic treatment ($n = 12$, 11 boys) (Eikeseth et. al., 2007). Both treatment groups took place in public kindergartens and elementary schools for typically developing children. Each child was assigned at least two therapists: a special education teacher and one or more aides. During the individual treatment sessions for both groups, the child worked with their therapists in a separate room. When not in therapy, the child was mainstreamed

while being shadowed by the therapists. No child was in the same class as other study participants. The behavioral group received a mean of 28 hours of therapy per week, and the eclectic group received a mean of 29 hours per week while they were not in school, and the behavioral group's mean hours of treatment were 18 hours a week while the eclectic group's mean treatment hours were 16 hours while they were in school (Eikeseth et. al. 2007). The results of this study showed that the IQ of participants in the behavioral group as well as the Communication, Daily Living, Socialization, and Composite ratings of the Vineland Adaptive Behavioral Scales (Sparrow, Balla, & Cicchetti, 1984) increased by a statistically significant amount as compared to the eclectic treatment group. Consequently, the Maladaptive Behavior section of the Vineland Adaptive Behavioral Scales decreased by a statistically significant amount as compared to the eclectic control group (Eikeseth et. al., 2007).

Sallows and Graupner (2005) studied 23 children in either an early intensive behavioral treatment or a parent-directed therapy group that received similar intensiveness, but less supervision by the supervisors of the study. The goal of the study was to determine if parent-directed groups could provide similar gains for children with ASD when children in a parent-directed group are compared to children who received therapy at a university clinic setting. Participants were selected based on the following criteria: (a) an age at intake between 24 and 42 months, (b) a ratio estimate (mental age one child who received 14 hours per week. $[MA] \text{ divided by chronological age } [CA]$) of the Mental Development Index of 35 or higher (the ratio estimate was used because almost all children scored below the lowest Mental Development Index of 50 from the

Bayley Scales of Infant Development Second Edition (Bayley, 1993), (c) neurologically within “normal” limits as determined by a pediatric neurologist, and (d) a diagnosis of autism by independent child psychiatrists (Sallows & Graupner, 2005). The participants received treatment for 4 years, and the outcomes of the groups were compared. The average treatment time during the week for both groups was 40 hours. The treatment paradigm was taken from Lovaas' (1987): the only difference in this study's treatment paradigm was that no aversive stimuli (such as saying no or slapping one's leg) were used to deter behavior. Results showed that the average IQ for all 23 children increased from 51 to 76. Eight of the children achieved IQs of 85 or higher after 1 year of treatment (5 clinic-directed and 3 parent-directed), and 3 more reached this level after 3 to 4 years (3 parent-directed; 48%, of the children). Children with higher IQ at the beginning of the study were more likely to reach 4-year IQs in the average range. There were no significant differences between groups at the pre- or posttest measurement, and the pretest to posttest gains were significant (Sallows & Graupner, 2005).

Table 2. Definition of Terms for Behavioral Intervention.

Term	Definition	Reference
1. Operant Behaviors	Behaviors under an individual's direct control. Ex. a person requesting a cookie	(Ingersoll, 2010)
2. Self-stimulatory behaviors	“Prolonged ritualistic, repetitive, and stereotyped behavior.” Ex.: rocking back and forth repeatedly	(Lovaas, 1987)

Table 2. Definition of Terms for Behavioral Intervention Continued.

3. Antecedent	Context or situation that precedes a behavior. Ex. a cookie being withheld from a person.	(Ingersoll, 2010)
4. Reinforcement	The item, context, or action/activity that causes the person to perform the behavior again. Ex. the fact that the person was given a cookie will cause the person to request a cookie again	(Ingersoll, 2010)
5. Direct Prompting	Asking the client/allowing for the client to imitate the clinician's behavior, or saying a specific phrase to remind the client of the next step to take in an interaction or chained behavior. Ex. "I said cookie! What is this?" or "What then? /What comes next?"	(Ingersoll, 2010), (Ingersoll et. al. 2012)
6. Natural/Functional Context	The context in which a targeted behavior is most likely to be performed. Ex. asking for a cookie during snack time while sitting at a table.	(Ingersoll, 2010), (Ingersoll et. al. 2012)
7. Eye-contact	Directing one's eyes towards another person or object in order to focus on the person or object.	(Phillips, Baron-Cohen, & Rutter, 1992)

Table 2. Definition of Terms for Behavioral Intervention Continued.

<p>8. Appropriate conversational topics/comments</p>	<p>Examples of appropriate conversational topics and comments are as follows: topics of conversation that are appropriate to the current environment that the person is in (not talking about death in public), staying on a conversational topic for an appropriate length of time (not speaking about one topic exclusively), not switching conversational topics too soon (only making one comment before speaking of something else), and making comments that are appropriate for the topic of conversation (not laughing when someone mentions a loss).</p>	<p>(Koegel, & Frea, 1993)</p>
<p>9. Chaining</p>	<p>Linking behaviors together to create a more complex behavior. Ex. teaching turning on a faucet, then getting soap, then rubbing soapy hands together under a faucet in sequential order to teach a person how to wash their hands.</p>	<p>(Ingersoll, 2010)</p>
<p>10. Fading</p>	<p>Gradually taking away prompts as a person masters a behavior. Ex. no longer asking “What comes next?” after a person demonstrates the sequential steps to hand washing with fewer than two errors.</p>	<p>(Ingersoll, 2010)</p>

DEVELOPMENTAL SOCIAL-PRAGMATIC INTERVENTIONS (DSPI)

DSPI interventions are based on the social–pragmatic model of language acquisition (Prizant, Wetherby, & Rydell, 2000). This intervention was derived from research on typical child development that indicates a relationship between caregivers’ responsiveness and their child’s level of social-communication development. The researchers who developed this intervention approach holds that social-communication skills, such as initiating conversations and joint attention to stimuli, are learned in a similar developmental sequence by all individuals, regardless of ability (Bruner, 1983). DSPI perspectives consider the pattern in which individuals acquire skills to be the same, regardless of situation, context, ability, or physiological/cognitive differences. Typical development is used to guide intervention targets for individuals with delays, and all people learn through interactions with responsive communicative partners. For example, eye contact is developed before joint attention in the typical language development process (Ingersoll, Dvortcsak, Whalen, & Sikora., 2005).

All DSPI interventions are classified by four characteristics: 1. Teaching follows the individual’s lead or interest. The communicative partner focuses on using facilitative strategies to increase their comments in relation to the behavior of the person with ASD. 2. The clinician or adult arranges the environment to encourage communication from the child. 3. All communicative attempts, including unconventional and pre-intentional communication (communication that takes place before a person can intentionally communicate) are responded to as if they were purposeful. 4. Emotional expressions are emphasized by the communicative partner, and language and social input are adjusted to

facilitate communicative growth. DSPI uses facilitative strategies, which are strategies in which adult/clinician/caregivers work alongside a person to model or prompt target behaviors in a way that responds to the person's attempts to interact or perform the target behavior, to increase the communicative partner's responsiveness to the person with ASD's behavior and to establish balanced conversational turns between the person with ASD and the conversational partner. In the instance of a young adult with ASD, a communicative partner would focus on maintaining joint attention to the item of interest of the young adult, and comment on the young adult's behavior in order to encourage the young adult to communicate in a back-and-forth exchange. (Gerber, 2003), (Bruner, 1983), (Mahoney, 1998), (Mahoney, Powell, 1988).

Efficacy of DSPI

Three studies have been selected to explore the efficacy of DSPI as an intervention method for working with people with autism. Ingersoll, Dvortcsak, Whalen, & Sikora (2005) sought to explore whether DSPI approaches could increase the rate of expressive language development in young children with ASD. The three male participants met the criteria for ASD. One participant was 3 years 10 months old, one was 2 years 6 months old, and one participant was 2 years 8 months old. No specific language targets were chosen for the participants; rather, the goal of the treatment was to increase each child's rate of expressive language. The therapy was structured by the following criteria: the therapists should always follow the child's lead, the therapists set up the environment to encourage initiations in conversation from the child, the therapists treated all of the child's communicative attempts as purposeful, the therapists emphasized

appropriate affect, and therapist used indirect language stimulation techniques. The design of the study was a single-participant, multiple-baseline design. Participants attended therapy 2 days per week for 50-min sessions throughout the baseline and treatment portions of the study. Baseline lengths were chosen beforehand and were 2, 4, and 6 weeks. Participants were randomly assigned to the different baselines, and all participants received 10 weeks of language therapy using a DSP approach. Generalization was assessed every week by observing each child during a 10-min free play session with his parent. Parents were told to play with their children like they would at home and were not trained in the intervention techniques. Follow-up visits were conducted a month after the treatment portion was over, and during that visit, the child participated in structured observation with the therapist and parent (Ingersoll et al., 2005). The results of the study showed that during the baseline portion, participant 1 exhibited the most language ($M = 25$, range = 0– 40), participant 2 exhibited intermediate rates of language ($M = 14.3$, range = 0– 40), and participant 3 exhibited no language at all ($M = 0$). During treatment, participant 1's rate of language increased ($M = 60.6$, range = 11–90), participant 2's rate of language increased ($M = 53.6$, range = 0–90), and participant 3's rate of language increased ($M = 8.1$, range = 0–20).

Ingersoll (2010) compared the effects of three different naturalistic language teaching approaches (responsive interaction being the same as DSPI, milieu teaching, and a combined approach) on the expressive language behavior of two children with ASD. Both participants went to the intervention center 2 days per week for approximately a month. At each visit, three to four 10-min treatment sessions were conducted (one for

each intervention), totaling seven to eight implementations of each condition for each child. Participant 1 was 42 months at intake. He met full criteria for a moderate diagnosis of autism. His nonverbal mental age was 28 months and his verbal mental age was 21 months on the Baley (Baley, 1993). On the CDI (Fenson et al., 1993) his expressive vocabulary was 56 words, or 17 months expressive language age. His spontaneous language consisted primarily of word approximations and single words. His language targets for this study consisted of single words. Participant 2 was 40 months at intake. Participant 2 met full criteria for a mild diagnosis of autism. His nonverbal mental age was 29 months and his verbal mental age was 34 months on the Mullen (Mullen, 1995). On the CDI (Fenson et al., 1993). Participant 2's expressive vocabulary was 579 words, or 30 months expressive language age. His spontaneous language was single words and simple phrase speech. He used a variety of communicative functions, such as requesting, commenting/sharing, protesting, greeting, and gaining attention and information. Participant 2's language targets for this study consisted of noun–verb and noun–adjective combinations (Ingersoll, 2010).

The differences in the approaches were as follows. The responsive interaction approach focused on language modeling and expansion: the goal of the responsive interaction approach was one language model every 10 to 15 seconds. The milieu teaching approach (procedures, such as time delays and modeling, which encourage a person to respond to a clinician or caregiver's attempt to interact with them in order to receive the consequence that they desire) focused direct elicitation of the language goals with a goal of one elicitation of language every 20 to 30 seconds. The combined approach

simply combined the focuses of the two previous approaches: this approach used both direct elicitation and language modeling/expansion. The results indicated that both participants gained more total language use during the milieu teaching portion of the treatment cycle. However, at least one of the participants, towards the end of the study, gained language use at a fast rate to the point that when the study was over and the data was analyzed, there was no difference in mean language use between the three approaches. Overall, the milieu teaching cycle was determined to be the most effective.

Ingersoll, Meyer, Bonter, & Jelinek, (2012) sought to corroborate and further the results of Ingersoll's (2010), study increasing the number of participants to see more sensitive results. Like the 2010 study, Ingersoll et.al. (2012) used the responsive interaction approach (DSPI), milieu teaching, and a combined approach of the two. Five participants were selected for the study. All were diagnosed with ASD. Participant One was 36 months old. His nonverbal mental age was 19 months on the Baley (Baley, 1993), and his verbal mental age was 17 months on the PLS-4 (Zimmerman, Steiner, & Pond, 2002) (13 months for auditory comprehension and 20 months for expressive communication). His spontaneous language was word approximations and a few single words. Participant One's language targets were single words or word approximations (i.e., producing any sound that was part of the target word). Participant Two was 66 months old. His nonverbal mental age was 27 months on the Bayley (Baley, 1993), and his verbal mental age was 21 months on the PLS-4 (Zimmerman, Steiner, & Pond, 2002) (20 months for auditory comprehension and 23 months for expressive communication). Participant Two's spontaneous language was single words used for requesting and

labeling and a few two- to three-word phrases. Participant Two's language targets were single words. Participant Three was 46 months old. He had a nonverbal mental age of 16 months on the Bayley (Baley, 1993) and a verbal mental age of 18 months on the PLS-4 (Zimmerman, Steiner, & Pond, 2002) (15 months receptive language and 22 months expressive language). Participant Three's spontaneous language was single words for requesting. Participant Three's language targets were single words. Participant Four was 54 months old. He had a nonverbal mental age of 27 months on the Bayley (Baley, 1993) and a verbal mental age of 30 months on the PLS-4 (Zimmerman, Steiner, & Pond, 2002) (29 months for auditory comprehension and 31 months for expressive communication). Participant Four's spontaneous language was two- to three-word phrases used for requesting and commenting. Participant Four's language targets were phrases of two or more words. Participant Five was 53 months old. His nonverbal mental age was 27 months on the Bayley (Baley, 1993). His verbal mental age was 25 months for auditory comprehension, 35 months for expressive communication, and 28 months for total language on the PLS-4 (Zimmerman, Steiner, & Pond, 2002). Participant Five communicated with phrases used to describe, request, and ask questions. Participant Five's language targets were phrases of three or more words (Ingersoll, Meyer, Bonter, & Jelinek, 2012).

Participants came to therapy 2 days per week for 12 weeks. During each visit, three 20-minute sessions were conducted; the first 10 min of each session were filmed for scoring. The first 2 weeks were baseline sessions that determined the child's rate of language use during a non-treatment condition. Baseline was followed by 3 weeks of

each treatment condition. 1 day of baseline occurred between each treatment condition. A coin flip was used to determine which participant got which treatment order. A month after the treatment was completed, each child visited the laboratory one more time and received three 20-min sessions, one of each treatment condition (Ingersoll, Meyer, Bonter, & Jelinek, 2012). The results of the study showed that all participants exhibited higher rates of total language targets in at least one of the treatment conditions than at baseline. Two of the five children exhibited this pattern across all three intervention conditions. Across all five children, responsive interaction produced substantially lower rates of total language targets than the other interventions.

Table 3. Definition of Terms for Developmental Social-Pragmatic Intervention.

Term	Definition	Reference
1. Preintentional Communication	Communication that takes place before a person can intentionally communicate. Ex. vegetative crying	(Ingersoll, 2010)
2. Facilitative/ Responsive Interaction Strategies	Strategies which adult/clinician/caregivers work alongside a person to model or prompt target behaviors in a way that responds to the person's attempts to interact or perform the target behavior.	(Ingersoll, 2010)

ENHANCED MILIEU TEACHING (EMT)

EMT is a hybrid approach to naturalistic, early language intervention (Hancock & Kaiser, 2002). Milieu teaching was “described first by Hart and Rogers-Warren (1978) as a collection of “naturalistic” instructional procedures that build on incidental teaching

methods described by Hart and Risley (1975). The milieu teaching practice does not have a single developer, though several groups of investigators have produced information and materials for this practice” (Milieu Teaching, 2012.) EMT incorporates both behavioral (Lovaas, 1987) and social interactionist (Prizant, Wetherby, & Rydell, 2000) approaches, such as DSP, to language intervention. EMT uses environmental arrangement (creating a context that resembles contexts the client engages with daily, while also ensuring that the environment contains obstacles in the way of the client's desires) to promote the person's engagement with activities and communication partners (Ostrosky & Kaiser, 1991), facilitative/responsive interaction techniques to build social and/or conversational interactions and to model new language forms (Weiss, 1981), and milieu teaching procedures (procedures, such as time delays and modeling, that encourage a person to respond to a clinician or caregiver's attempt to interact with them in order to receive the consequence that they desire) to prompt, model (demonstrating a behavior), and consequence (revealing to a person that one action is a consequence of another action) the use of new language forms in their natural/functional contexts (Hancock & Kaiser, 2002). This use of naturalistic contexts is an extension of Behavioral Interventions (BI). Within EMT, clinicians are still using antecedents and reinforcements to incentivize the child to perform the behavior: the focus is different in that EMT uses natural reinforcements, such as obtaining the item the child wants or social praise, to reinforce behavior. By using more naturalistic reinforcement, EMT hopes to generalize these behaviors to natural/functional contexts by having the child perform the target behavior in a context that closely resembles the context in which they would be expected

to perform the behavior, such as having the child pretend to eat in a therapy room that closely resembles a dining room/kitchen.

Arranging the environment entails creating a context that resembles contexts the client engages with daily, while also ensuring that the environment contains obstacles in the way of the client's desires such as making the therapy room simulate a kitchen to model proper interactions during meals, while placing preferred foods out of the client's reach to incentivize a request for the preferred food. Communicative partners begin with the individual's nonverbal or verbal requests, follow a predetermined sequence of prompts or models, such as tacts (commenting/naming things in the immediate physical environment), mands (a request fueled by a state of deprivation or aversion in which the fulfilled request acts as its own reinforcement), time delays (pauses to allow a person to make a request again or to clarify their request), and expansions (extending person's utterance into a more complete and complex form), include corrective prompts as individual needs them, and end the interaction with positive feedback, expansion of the individual's utterance, and the fulfillment of the person's request, which also serves as reinforcement (Hancock & Kaiser, 2002)

Efficacy of EMT

Three studies have been selected to explore the efficacy of EMT as an intervention method when working with people with autism. Kaiser, Hancock, and Nietfield (2000) investigated whether parents could learn to implement EMT in their homes and whether or not EMT would lead to greater use of language targets and social communication in the clinic-setting as observed by parents? The children met the

following criteria: (a) the child was between 2.5 and 5 years of age; (b) the child had at least a 6-month delay in expressive language as measured by the SICD (Sequenced Inventory of Communication Development) (Hendrick, Prather, & Tobin, 1975); c) the child could verbally imitate; (d) the child had an expressive vocabulary of at least 10 spontaneous words; and (e) the child's hearing was within the normal range. The children's parents also had to meet the following criteria. The parents consented to: (a) bring the child to the clinic setting twice each week for 45 minutes of treatment and 15 minutes of feedback during the intervention phase, and to bring the child once each month for six months during the follow-up phase; (b) allow the project staff to visit their home nine times over the course of the study; c) be trained to implement the intervention with their child; and (d) be videotaped at home and at the clinic (Kaiser, Hancock, Nietfield, 2000). The six participants were all boys. Their mean age was 42 months with a range of 32-54 months. All of the participants had expressive and receptive language skills in the 20-28 month range as tested by the Sequenced Inventory of Communication Development (Hendrick, Prather, & Tobin, 1975). The average MLU for the participants was 1.48, and their IQ ranged from <50 to 85. All sessions took place in a university-clinic setting. The results of this study showed that all parents except one learned to use EMT procedures to criterion levels during the 24 sessions. The participants themselves showed increases in their total use of language targets and positive progression, albeit varied, across the six developmental measures used to assess the participant.

Hancock and Kaiser (2002) explored the effects of trainer-implemented, rather than parent-implemented, EMT on the language output of four preschool children with

ASD. The participants all met the following criteria: (a) The child was between 2.5 and 5 years of age, (b) the child had at least a 6-month delay in expressive language as measured by the Sequenced Inventory of Communication Development (SICD; Hedrick, Prather, & Tobin, 1983), (c) the child could verbally imitate, (d) the child had an expressive vocabulary of at least 10 spontaneous words, and (e) the child's hearing was within the normal range. The children's parents had to meet the following criteria: Parents had to agree to (a) bring the child to the clinic setting twice each week during the intervention phase and once every month for 6 months during the follow-up phase, (b) allow project staff to visit their home nine times over the course of the study, and (c) be videotaped at home with their child and allow their child to be videotaped at the clinic. The participants had a mean age of 44 months (range 35-54 months). All children had expressive and receptive language skills in the 20- to 28-month range as tested by the SICD (SICD; Hedrick, Prather, & Tobin, 1983). The children's average Mean Length of Utterance (MLU) at entry was 1.29 (range 1.03 – 2.00), and their measured IQ scores ranged from < 50 to 95. All sessions took place in a university-clinic setting. The results of the study showed that all four children increased in their amount of social-communication used during the sessions, and all children increased their scores and their amount of language targets on the six developmental measures used at baseline to assess the participants.

Olive, Cruz, Davis, Chan, Lang, O'Reilly, & Dickson (2006) evaluated the effects of EMT when combined with a voice output communication aid (VOCA) on the requesting skills of three boys with ASD. All participants were diagnosed with severe

ASD. The participants were aged 45 months, 66 months, and 48 months respectively. They were taught how to use a VOCA system and EMT procedures were used to elicit requests using the VOCA system during a five-minute play session four times a week during the duration of the study. Though none of the children used the VOCA during the baseline sessions, the children increased their use of the VOCA system to request items/actions by an average of 10.5, 7.3, and 12.8 times per session.

Table 4. Definition of Terms for Enhanced Milieu Teaching.

Term	Definition	Reference
1. Environmental Arrangement	Creating a context that resembles contexts the client engages with daily, while also ensuring that the environment contains obstacles in the way of the client's desires. Ex. making the therapy room simulate a kitchen to model proper interactions during meals, while placing preferred foods out of the client's reach to incentivize a request for the preferred food.	(Hancock & Kaiser, 2002)
2. Facilitative/ Responsive Interaction Strategies	Strategies which adult/clinician/caregivers work alongside a person to model or prompt target behaviors in a way that responds to the person's attempts to interact or perform the target behavior.	(Ingersoll, 2010)

Table 4. Definition of Terms for Enhanced Milieu Teaching Continued.

3. Milieu Teaching Procedures	Procedures, like time delays and modeling, that encourage a person to respond to a clinician or caregiver's attempt to interact with them in order to receive the consequence that they desire.	
4. Model	Demonstrating a behavior. Ex. saying the word cookie and showing the person a cookie; saying the words “open the jar” while opening the lid to a jar.	(Ingersoll, 2010)
5. Consequence/Consequence	Actions that follow a behavior. Ex. the person is given a cookie after requesting it. Consequating is revealing to a person that one action is a consequence of another action. Ex. A person realizes that they will get a cookie if they ask for one.	(Ingersoll, 2010), (Hancock & Kaiser, 2002)
6. Natural/Functional Context	Context in which a targeted behavior is most likely to be performed. Ex. asking for a cookie during snack time while sitting at a table.	(Ingersoll, 2010), (Ingersoll et. al. 2012)
7. Tact	The act of commenting/naming things in the immediate physical environment. Ex. “That is a cookie!”	(Verbal Operants, 2013)
8. Mand	Request fueled by a state of deprivation or aversion in which the fulfilled request acts as its own reinforcement. Ex. The person stating “I want a cookie!”	(Verbal Operants, 2013)

Table 4. Definition of Terms for Enhanced Milieu Teaching Continued.

9. Time Delays	Pauses to allow the person to request again or clarify their request. Ex. The person stating “I want a cookie!” “What do you want?” -2 second delay- “I want a cookie please!”	(Hancock & Kaiser, 2002)
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ADAPTATION OF INTERVENTION TECHNIQUES

Hall, Maynes, and Reiss (2009) examined whether percentile schedules could be used to reduce eye-contact aversion in individuals with Fragile X syndrome. Rather than giving immediate reinforcement, percentile schedules result in a reinforcement, such as praise, only a certain percentage of the time. This procedure is to ensure that the reinforcement does not lose its impact too quickly. This is an adaptation that may support generalization of behaviors into long-term actions in transitional adults with ASD. It will be incorporated into the study procedures. As for DSPI and EMT no adaptations that would be applicable to the therapy of transitional adults with ASD could be found. Further, the studies that were selected did result in more overall language being used by the participants, but did not expressly focus on pragmatic language or social communication outcomes other than the participants communicating more in a social setting. As such, adaptations to expand these language gains to other areas of pragmatic language, such as understanding or appropriate use of idiom, have not been found or explored within these studies.

OVERVIEW OF APPROACHES

The three interventions reviewed have been explored for use with young adults with ASD. However, every study, including the adaptation studies that examine how these interventions can be adapted for use with other populations, have focused on young children. The goal of this report is to explore interventions that could be successfully implemented for transitional adults with ASD. Further adaptations of these interventions with transitional adults with ASD, and more efficacy studies of these adaptations, are necessary to enhance SLPs understanding of how best to improve communication functions in this vulnerable population.

Table 5. Overview of Approaches.

Name of Intervention	Naturalistic Behavioral Intervention (BI) (Lovaas, 1987),	Developmental Social-Pragmatic Interventions (DSP) (Prizant, Wetherby, & Rydell, 2000)	Enhanced Milieu Teaching (EMT) (Hancock & Kaiser, 2002)
Theoretical Perspective	Based on the application of learning theory: Operant behaviors are learned. Behaviors are developed and maintained by antecedents and consequences. Appropriate skills can be taught through the manipulation of antecedent variables and the application of reinforcement.	DSP interventions are based on the social-pragmatic model of language acquisition. Social-communication skills are learned in a similar developmental sequence by all children, regardless of ability. The DSP perspective considers the pattern in which children acquire skills to be the same. Typical development is used to guide targets. People are proposed to learn through interactions with caregivers.	EMT incorporates both behavioral and social interactionist approaches to language intervention. This is in hope of combining the approaches to gain the benefits and theoretical perspectives of both approaches.

Table 5. Overview of Approaches Continued.

Focus/Purpose	BI uses direct prompting and reinforcement within natural contexts to teach specific social communication skills. Approach uses specific teaching tools such as prompting, chaining, and fading.	DSP uses facilitative strategies to increase the adult's responsiveness to the child's behavior and to establish balanced conversational turns between the person and the adult.	EMT uses environmental arrangement to promote engagement with activities and communication partners, responsive interaction techniques to model new language forms, and milieu teaching procedures to consequate the use of new language forms in their functional contexts.
Target Population	Age range of 40 months to 7 years old.	Age range of 30 months to 66 months	Age range of 2.5 years to 5 years old.

Table 5. Overview of Approaches Continued.

<p>Implementation</p>	<p>Focus is on direct prompting to facilitate person's language use and behaviors. Teaching occurs in the natural environment. The person initiates the exchange by indicating interest in an item or activity. The adult prompts the person to produce the target behavior. The person's production of the target behavior is reinforced with the item or activity of interest. The adult shapes the person's response into a more complex response, reinforcing the attempts to respond.</p>	<p>Adults focus on using facilitative strategies for increasing their comments responding to their child's behavior. Teaching follows the child's lead or interest. All communicative attempts, including unconventional and preintentional communication, are responded to as if they were purposeful. Emotional expressions are emphasized by the adult. Language and social input are adjusted to facilitate communicative growth.</p>	<p>Adults begin with the person's nonverbal or verbal requests, follow a predetermined sequence of prompts (models, mands, or time delays), include corrective prompts as person needs them, and ends the interaction with positive feedback, expansion of the person's utterance, and the fulfillment of the person's request, which also serves as reinforcement.</p>
<p>Similarities</p>	<ol style="list-style-type: none"> 1. Conducted in meaningful interactions within the natural environment. 2. Teaching materials and activities are chosen by the client. 3. Natural reinforcement is used to prompt communication. 		

CHAPTER 2

METHODS

Available literature has revealed issues with how SLPs can best serve the transitional young adults with ASD. Intervention studies focused on this population are sparse. As a result, SLPs may not have the evidence-based/data-based rationale necessary to give transitional autistic young adults in their caseload interventions based on EBP guidelines. Intervention in this area of clinical practice must presently be based on the clinical experience of the SLP, the lowest level of evidence (ref here). Not every SLP has the clinical expertise to properly serve this young adult population. To fill the gap left by not having well researched methods of intervention for this vulnerable population, an instructional video that details adaptations made to potential intervention approaches that may be adapted to meet the needs transitional young adults with autism was developed. Details regarding the participant-client's information, the creation of the video, and the discussion of the findings from implementation of these intervention approach adaptations the video are summarized.

Participant

DEVELOPMENTAL HISTORY

The participant-client is a 26-year-old woman diagnosed with ASD at the age of 4 years. She will be referred to in this report as "J". J's mother, who provided a majority of the parent report information with corroboration from J, reports that her daughter lost ability to speak single words and no longer babbled at the age of 18 months. J reverted to pointing and grunting as her main form of communication. At the age of 3 years old, J's

mother enrolled her in intensive, early-intervention speech-language therapy. J regained the ability to jargon babble as a form of communication. J did not regain the ability to say intelligible single words and phrases until she was 5 years old. She was raised mostly by her single-mother with no siblings until her mother re-married when J was 11. At that time J gained two younger step-brothers. Her youngest step-brother also has ASD. She is currently living in an apartment independent of her family.

EDUCATIONAL HISTORY

J's primary and secondary schooling occurred in a mainstream classroom. She is reported as achieving "above average" grades. She has completed a bachelor's degree in Creative Writing and Studio Art. Her schooling was classified as an academic success, but with some social difficulties. She reports that she was regularly bullied by both peers and teachers. This social environment included a teacher in the seventh grade who insisted to a school board and to J's mother that J should be institutionalized in a group home rather than attend class in a mainstream classroom setting. This teacher also did nothing to stop bullying by J's peers, stating that J deserved the bullying and did not deserve "special treatment".

SOCIAL HISTORY

J also exhibits occasional tantrum behaviors in her present adult context. These tantrum behaviors are tied to panic attacks which are triggered by stressful events or being overstimulated by the environment around her, according to J. She reports that auditory sensitivity is a primary source of excessive stimulation for her: she states that noises such as neon lights are louder for her and distract her from paying attention to

conversations in the immediate environment. She and her mother report that her over-stimulation leads her to either shaking, crying, or escapist tendencies such as fleeing the room.

Other than her tantrum behaviors, J has had very little difficulty making friends in adulthood. Many of her friends report to her that they do not notice her ASD until she brings it up via explaining her auditory and visual sensitivities or her literal moments. Her mother reports that J required a longer period to understand the nuances of sarcasm and idioms; if the language is ambiguous as to whether someone is joking, J may be confused and wonder whether she should laugh along with the person or whether the person is laughing at her. She still asks for clarification regarding instructions and jokes if the meaning is not made clear for her in her contemporary environment.

EMPLOYMENT HISTORY

J is now employed full-time. She is presently employed as a cashier and art instructor at Michael's craft supply store. She has been at this work setting since October, 2015. Her duties at Michael's are to act as a cashier and customer service representative. She handles payment transactions and directs customers to managers for further customer assistance. She also teaches a drawing class at Michael's every Tuesday night. She reports teaching an average of three students a week. Most of her employment history has included customer service, primarily as a cashier, a greeter, or a secretary.

MEDICAL HISTORY

J's mother reports no major medical issues in J's early life. J reports a history of oversensitivity to pain, with the arrival of menstruation being a particularly traumatic and

painful time in her life. J is presently seeking medical treatment for sensory integration issues. She reports migraines that have required hospitalization in the past. When these migraines occur, J loses the ability to walk without assistance, her speech takes on a slurred quality, and her vision becomes very blurry and extremely sensitive. Her latest migraine episode led to a period of temporary amnesia. Her migraines lower her threshold for environmental stimuli, making tantrum behaviors more likely to occur in the midst of a migraine according to her mother and to her own self-report.

INTERVENTION AND INTERVENTION GOALS

Because of J's age and relative social and employment independence, intervention focused on responding to her functional concerns relative to her daily environment. J feels that she has adapted to her ASD, but reports that she would like to focus on social rituals and presentation, and maintaining conversational appropriateness. She notes that she is “awkward and shares too much personal information in the name of friendship”.

Based on this information from J, goals illustrated on the video will include the following: 1. J will increase conversational appropriateness by following models of appropriate conversational exchanges as performed by the clinician, 2. J will use appropriate social presentation and rituals by following a model of appropriate social presentations and rituals as performed by the clinician. The video was designed so that two activities would be conducted that would simultaneously target both broad, long-term goals.

Creation of the Video/Technique Illustration Procedures

The video features a clinician who is in master's level training to gain CCC-SLP at The University of Texas at Austin in the Department of Communication Sciences and Disorders and a client-participant who is an adult diagnosed with autism. The clinician used Canon Vixia HFM500 video-camera, a small tripod, and a memory card from the University of Texas Speech and Hearing Center. The camera was set up on the end of a table, in order to ensure the greatest range of view during the recording of the video.

The video models examples of therapeutic techniques from the three interventions. The Behavioral Intervention (BI, Lovaas, 1987), Developmental Social-Pragmatic Intervention (DSPL, Prizant, Wetherby, & Rydell, 2000), and Enhanced Milieu Teaching (EMT, Hancock & Kaiser, 2002) techniques illustrated were tailored to the goals developed by the clinician and the participant-client. This video was created to be an instructional video illustrating how to implement potential therapy goals rather than a full example of a therapy session.

SETTING

Two settings were used in the filming of the video. One setting was a child therapy room in the University of Texas Speech and Hearing Center. This is where the introduction and conclusion portions, as well as the explanations of BI, DSPI, and EMT were filmed. The therapy took place in the client-participant's home setting. This setting was chosen because the clinician wished the client-participant to be comfortable and at ease during the filming.

PROCEDURES FOR RECORDING THE VIDEO

The video used minimal materials. A table and two chairs, a reinforcement object (the client participant selected chocolate and cookies as a reinforcement), and objects that the client participant could engage/play with were employed. The client participant requested using homemade action figures. Off screen, the clinician instructed the client-participant about the intervention techniques that were being employed, the types of activities that the clinician was going to do, and answered any questions or concerns of the client-participant. The total video length was 21 minutes and 38 seconds long.

CHAPTER 3

RESULTS

Video Outcomes

The goal of this project was to produce a video that could guide SLPs in implementing three intervention approaches to support increases in functional language and communication behaviors for transitional adults with ASD. Naturalistic Behavioral Intervention (Lovaas, 1987), Developmental Social-Pragmatic Intervention (Prizant, Wetherby, & Rydell, 2000), and Enhanced Milieu Teaching (Hancock & Kaiser, 2002) were illustrated.

TECHNIQUE ILLUSTRATION OUTCOMES

The clinician carefully selected the techniques and terms that were used during the duration of the therapy illustrated on the video. The terms were selected for simplicity and importance to the execution of the intervention as a whole: for example, BI (Lovaas, 1987) requires antecedents, operant behaviors, and reinforcements as a defining feature of the intervention. The author, accordingly, chose to model these critical terms within the therapy portion of the video. The clinician did not use a gradual reinforcement schedule as described in the adaptation section of the literature review in order to demonstrate how initial reinforcement of a behavior is used within BI and EMT (Hancock & Kaiser, 2002).

VIDEO STRUCTURE

The video was split into two parts. The first part of the video was introducing the clinician, detailing the purpose and goals of the video, introducing the client-participant and giving her medical and social history. A summary of BI, DSPI, and EMT therapies and a simplistic example of how each intervention could be implemented was included. In addition, the differences between these interventions were highlighted. For example, while explaining the theoretical framework of BI, the author gave the example of how BI could be structured and targeted in the context of eating a meal in a kitchen. The kitchen context was considered the antecedent, food was the reinforcer, and learning to eat with a fork was the targeted the operant behavior. Later, when the author was detailing the theoretical framework of EMT, she gave a similar example to the BI example of how EMT could be implemented. In this illustration, the clinician outlined how the kitchen could be used as a functional context while. Unlike BI, EMT involves placing barriers such as height and distance in the way of the client's desires and forcing the client to interact with the clinician to gain the object they desire. This interaction and the consequential gaining of the desired outcome would act as a reinforcement for communicating the desired outcomes more frequently according to EMT.

The second part of the video was the illustration of therapy for BI, DSPI, and EMT that was developed to specifically target the client-participant's two goals: 1. J will increase conversational appropriateness by following models of appropriate conversational exchanges as performed by the clinician, 2. J will use appropriate social presentation and rituals by following a model of appropriate social presentations and

rituals as performed by the clinician. The therapy was split into the three interventions BI, DSPI, and EMT. Each of the three interventions demonstrated two activities. The activities were designed to target both goals at once.

For BI, the first activity involved teaching J how to say please and thank you in response to receiving the food she wanted. The second activity was a conversation in which the clinician taught J to give more space between conversational utterances to let the other conversational partner speak. The author reinforced the behavior with chocolate and praise. The BI portion of the demonstration illustrated the following terms from Table 2: operant behaviors, antecedent, reinforcement, direct prompting, and natural/functional context.

For DSPI, the author and client engaged in parallel play with home-made action figures. The client-participant modeled a conversation between two of the figures. The clinician modeled a conversation with appropriate back-and-forth exchange after the client-participant acted out her conversation. However, as with DSPI, the clinician did not make any linguistic demands of the client-participant. She simply engaged in parallel play and indirectly modeled conversational exchange. The second activity detailed the clinician modeling how to politely request a cookie without explicitly teaching or reinforcing the client's attempts to get a cookie. The DSPI portion of the therapy demonstrated facilitative/responsive interaction strategies from Table 3.

For EMT, the clinician modeled another conversation between the action figures. The client-participant had to request for another figure that was out of her reach. The clinician responded by giving the figure to the client-participant at her request. For the

second activity, the clinician modeled how to politely ask for a cookie, then the client-participant asked politely for chocolate. The EMT portion of the therapy demonstrated the following terms from Table 4: environmental arrangement, milieu teaching procedures, model, time delay, and expansion.

CHAPTER 4

DISCUSSION

The clinician and the client participant discussed the production of the video. Several conclusions emerged from this qualitative analysis. The video was felt to be valid to illustrate the targeted intervention techniques and include the client-participant's personal goals and preferences.

A primary concern with this video illustration was about how goals and progress would be measured within the treatment paradigms of Naturalistic Behavioral Intervention (Lovaas, 1987), Developmental Social-Pragmatic Intervention (Prizant, Wetherby, & Rydell, 2000), and Enhanced Milieu Teaching (Hancock & Kaiser, 2002), especially when these interventions are being used with transitional adults with ASD. The therapy styles of BI, DSPI, and EMT have the possibility of being more useful/used with higher-functioning adults with ASD, as they are the individuals most capable of entering the transitional stage of development (i.e. transition from a family home to an independent home or from primary education to secondary education). As such, these adults are verbal. EMT (Hancock & Kaiser, 2002) is used primarily with non-verbal individuals or individuals with very low verbal output. EMT's emphasis on verbal output would likely lead to goals much like the ones that the volunteer selected, primarily relationship, social, or pragmatic goals. Some data may be taken numerically, especially in the case of measuring conversational transitions or amount of eye-contact made in a session. In the case of this client-participant's goals however, the data gathered would be

primarily subjective and up to the client to determine the effectiveness of the therapy experiences illustrated. This reliance on client rather than clinician measurement of outcomes could lead to discrepancies and a lack of accuracy when measuring therapy effectiveness.

Clinician-Participant Outcomes

The client-participant stated that she had fun participating in this project and enjoyed how her desires and interests played a part in the development of the video. Her primary input relative to the intervention types was that she preferred the EMT and DSPI approaches to the BI approach. She stated that the EMT and DSPI interventions felt more natural. She felt that she could model the clinician's actions and words with a clearer example within these two interventions. She stated her concern that BI could be “infantilizing” to higher-functioning autists. Autists is a self-identifying term for the ASD community to use to describe themselves.

She asserted that, “I understand how reinforcement is a good way for someone to do something, but if it isn't done correctly or in a more natural setting, the high-functioning autists would know that they are being manipulated and trained into doing a behavior for a reward and nothing more, like a trained monkey. Or they would do an action because they got reinforced, but every-time they did it, they would expect a reward, and not all contexts are like that. And I know I have literal moments: if you taught me to do something in a therapy room for a reward, my mind would have difficulty adjusting to doing that outside the therapy room because I would expect the situation to be the same. It's better to be more natural and realistic in therapy and not talk-down to or condescend to people. I'm afraid that some higher-functioning autists would sit in therapy and feel as though it's something they have to do for a chocolate or something that makes them feel less than and infantilized and not because it's something that they want to do or something that they think will help them.”

The client participant stressed that she felt that an adult's wishes and goals should be taken into account when planning therapy so that the adult feel uplifted, encouraged, and motivated to attend therapy because they are making progress and are being celebrated for their progress.

Critique

Two obvious weaknesses emerge in this review of potential interventions that could be adapted for young adults with ASD. None of these three intervention methodologies specifically seeks to improve social-communication in young adults with ASD. As a result, the video must be considered as the lowest level of EBP, expert clinician demonstration of techniques from each of the intervention approaches. As noted, measurement of progress would be dependent on the client's rather than the clinician's judgment.

Future Research

As no studies detailing the efficacy of these interventions with the specific population of young adults with ASD have been completed, further research is necessary to follow up on this pilot study to explore the efficacy of these interventions with young adults who are diagnosed with ASD. In addition, other potential methodologies that could be developed/used with this population, and demonstrations of how to implement these interventions with this population need to be developed. The types and severity of involvement of participants in research on adaptations should be considered so that some

understanding of the influence of age and severity of young adults for which each intervention is most beneficial could be explored.

Conclusions

This report examined three intervention methodologies, Naturalistic Behavioral Intervention (BI, Lovaas, 1987), Developmental Social-Pragmatic Intervention (DSPI, Prizant, Wetherby, & Rydell, 2000), and Enhanced Milieu Teaching (Hancock & Kaiser, 2002). The goal was to adapt these interventions to speech-language therapy with young, transitional adults diagnosed with Autism Spectrum Disorders. BI states that behavior is under an individual's direct control, and can be modified through reinforcement to reward the behavior that is being taught. Reinforcement can be used to change the behavior of young adults with ASD, according to the authors of this approach. DSPI teaches that an indirect model with no linguistic demands sets an example for the client to follow, with the benefit of following the client's interest and lead within therapy. EMT authors state that reinforcement and following/fulfilling the client's desires in tandem with encouraging linguistic exchange leads to the client using language more often to obtain the objects or actions they desire. Each of these approaches contains principles relevant to issues faced by young adults with ASD.

In order to consider adaptations that might enhance these interventions and support practicing SLPs working with young adults with ASD, the goal of this project was to explore carefully the techniques of each approach as they are described in the literature. In addition, an instructional video was developed to illustrate how BI, DSPI, and EMT may be adapted for therapy with young adults with ASD. One young adult with ASD served as a therapy participant in the video. This illustrative video is viewed as a clinical tool for SLPs rather than as a research based tool at this point. Research is needed

to evaluate the efficacy of this tools with practicing SLPs. In this regard, interventions pursued with this population should be guided heavily by the consent and concerns of the individual client to ensure the clients are motivated to continue therapy and feel valued while within the therapy context.

To conclude, BI, DSPI, and EMT, have efficacy research to substantiate their claims that includes toddlers and preschoolers with ASD. Accordingly, adaptations and efficacy studies exploring how to implement these therapy methodologies with young adults with ASD must be undertaken by researchers to fill this evidence based practice gap for the benefit of all SLPs working with the population of young adults with ASD.

APPENDIX

This appendix contains supplemental files to this Master's Report.

1. File 1: Report Video.wmv

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