Effects of Training and E-mail Feedback On Behavior Therapists' Use of Instructive Feedback

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A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2016

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Program Authorized to Offer Degree:

College of Education

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Abstract

Effects of Training and E-mail Feedback On Behavior Therapists' Use of Instructive Feedback

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Given that more paraprofessionals are hired to deliver one-on-one intervention to children with Autism Spectrum Disorder (ASD) under the auspices of behavioral health agencies, it is important that these paraprofessionals receive adequate supervision to support their implementation of high quality intervention while often working alone without frequent observation and feedback from their supervisors. This study investigated a training package consisting of didactic training and performance feedback delivered via electronic mail as a means of improving behavior therapists' use of an evidence-based practice called instructive feedback (IF). A multiple baseline design across four behavior therapists was employed. The findings suggest that the training package was effective and efficient in improving behavior therapists' use of IF. However, only when e-mail feedback was given did the behavior therapists demonstrate proficiency of IF implementation. Maintenance and generalization across children, and social validity were also assessed.

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ACKNOWLEDGEMENTS

This journey of earning a doctorate is long and arduous, and I would not have done it without the great support that I have received from my professors, family, friends, and colleagues. I would like to express my sincere gratitude to all of them.

First and foremost, I would like to express my special gratitude and thanks to my advisor, Dr. Ilene Schwartz for imparting her knowledge and expertise not only in this study but also throughout my graduate school experience. I'm truly honored and lucky to have such a great advisor and mentor.

I would also like to thank my committee members, Jean Kruzich, Kathleen Artman-Meeker, and Elizabeth West. The classes I took and the numerous enlightening conversations we had have inspired me to be a better scholar and practitioner.

Special thanks also go to all the behavior therapists and children who participated in this research and donated their time to make this study possible. Thank you Matt Woodard for letting me conduct this study at his agency.

To all my wonderful Sum of Learning staff and families. They have been extremely patient with me while I was spending time away from work to prepare for my dissertation. They all stepped up and took charge while I was gone, I could not be more grateful for having such an amazing group of staff.

To all my behavior analyst colleagues whom I call dear friends, thank you for the countless nights of late-night texting, for proofreading many of my papers, and for bouncing ideas with me. Your support has been tremendous in helping me reach this dream. I might not have said this out loud, but you have all been an inspiration to me.

Lastly, I would like to thank my family for all their love, care, and encouragement. For my parents, who travelled to Seattle numerous times just to take care of me when I needed them the most. For my sister, Ida, who kept me sane when I was overwhelmed. For my cousin, Bianca, who kept me fed when I was busy and forgot to eat. And most of all, for my loving and supportive husband, Dr. Chin Hei Ng, who has shared this entire amazing Ph.D. journey with me and been my biggest motivation. I am sad that our competition has come to an end, but I am excited that we have another new journey ahead of us.

DEDICATION

To the memory of my father, David Sik Hung Chung.

Thank you for providing me a warm and safe home filled with unconditional love…

Thank you for sharing with me your wisdom…

Thank you for teaching me to be a hard-worker…

Thank you for your encouragement in pursuit of excellence…

Thank you for giving me a chance to pursue my education and American dream thousand miles away from home…

Thank you for believing in me and teaching me to believe in myself…

Thank you…for everything Dad. I miss you everyday and I hope I make you proud.

Introduction

The number of individuals affected by autism spectrum disorder (ASD) has grown at an alarming rate. In just the last two decades, the prevalence rate of ASD increased from one in 295 in 1996, to one in 110 in 2006, and to one in 68 in 2012 (Centers for Disease Control and Prevention, 2016). With such a dramatic increase of children diagnosed with ASD, more students are receiving special education services under the eligibility of autism (National Center for Education Statistics, U.S. Department of Education, 2011). The increase of autism awareness has also prompted the push for insurance coverage for behavioral health treatment for ASD (Sellers, Valentino, & LeBlanc, 2016). As of this writing, 43 states and the District of Columbia have laws that mandate insurance coverage for applied behavior analysis (ABA) when such services are deemed medically necessary in the treatment of autism (National Conference of State Legislatures, 2015).

To meet the increasing needs for ABA services, many paraprofessionals are hired to provide one-on-one intervention for children with ASD. These paraprofessionals are either trained by school districts to provide specially designed instruction as outlined by the student's individualized educational program (IEP) services; or they are trained by behavioral health agencies to provide intensive applied behavior analysis services (e.g., discrete trial training) in the home or community. (Boomer, 1994; Behavior Analyst Certification Board, 2014; Leaf, Taubman, McEachin. Leaf, & Tsuji, 2000). While paraprofessionals are expected to provide children with ASD with individualized and specialized interventions, the majority of them have little or no prior knowledge or experience in working with children with ASD (Symmes & Humphrey, 2011). The lack of proper training of paraprofessionals poses a serious threat to the integrity of treatment resulting in ineffective intervention, and worse, may negatively impact

child outcomes (Odom, 2009; Sanetti & Kratchwill, 2009). The current literature on professional development (PD) identifies multiple evidence-based training and coaching models to train professional and paraprofessionals. Performance feedback is one of the evidence-based training strategies that has garnered robust evidence to support its effectiveness on promoting sustainable changes of teaching behaviors. Despite the current literature on PD, most of these studies targeted paraprofessionals serving children with ASD in an educational setting (e.g., Hall, Grundon, Pope, & Romero, 2010; Koegel, Kim, & Koegel, 2014; Leblanc, Ricciardi, & Luiselli, 2005; Robinson, 2011). Paraprofessionals providing early intensive behavioral intervention (EIBI) under the auspices of behavioral health agencies face a different set of challenges than those faced by paraprofessionals working in schools. These may include working in isolation, a lack of immediate access to coworkers or supervisors, and difficulty in maintaining strict professional boundaries with families when spending many hours a week in their home. With the increasing employment of paraprofessionals providing ABA therapy in the home context, effective and efficient training and coaching practices must be identified to address the issues experienced uniquely by home-based behavior therapists.

Autism Spectrum Disorder (ASD) and Applied Behavior Analysis

Autism Spectrum Disorder (ASD) is a life-long, developmental disability that can cause significant social, communication, and behavioral challenges (National Institute of Mental Health, 2016). Deficits in social communication are manifested by lack of verbal and nonverbal communicative behaviors used for social interaction, limited social-emotional reciprocity, and difficulties in developing, maintaining and understanding relationships. ASD is also characterized by display of restricted or repetitive patterns of behaviors, interests, or activities (American Psychiatric Association, 2013). Boys were four and a half time more likely to be

identified with ASD than girls; and among children identified with ASD, 32% also present with comorbid intellectual disability (CDC, 2016).

Many medical and mental health conditions are also often reported to be comorbid to ASD. Medical conditions associated with ASD may include gastrointestinal symptoms, epilepsy, sleeping problems, and feeding problems (Mannion & Leader, 2013). Anxiety, depression, bi-polar disorder, and obsessive-compulsive disorder are also common mental health problems experienced by individuals with ASD. Attention deficit and hyperactivity disorder (ADHD) may be the most commonly co-occurring condition with ASD (Antshel, Zhang-James, Wagner, Ledesma, & Ledesma, 2016). In addition to the already complex symptoms of ASD, these secondary characteristics further complicate the educational needs of children with ASD.

Children with ASD present many unique learning challenges and they require highly specialized and individualized treatments. Among the numerous treatments available, behavioral treatment based on the science of applied behavior analysis (ABA) has garnered the most empirical validation. Researchers have been documenting the effectiveness of ABA to teach appropriate skills and decrease challenging behaviors in children with ASD over the past 50 years (e.g., Lovaas, 1987; Hanely, Iwata, Thompson, & Lindberg, 2000; Jeffries, Crosland, & Miltenberger, 2016; Koegel, Carter, & Koegel, 2003; Koegel, Koegel, Hurley, & Frea, 1992; Leaf et al., 2014; Peters & Thompson, 2015; Sigafoos, Green, Payne, O'Reilly, & Lancioni, 2009; Wong, Kasari, Freeman, & Paparella, 2007). Its successful remediation of core deficits of ASD has made ABA the standard of care for the treatment of ASD (Vismara & Rogers, 2010). ABA studies behaviors in context that requires careful evaluation of the learning and living environments, and behavioral principles are systematically applied to identify behavior changes and produce socially significant human behaviors (Cooper, Heron, & Heward, 2007). The first

study documenting the effectiveness of ABA for children with autism could be traced back to the 60s. Wolf, Risley, and Mees (1964) showed the efficacy of operant methods to teach a child with ASD to label objects and respond to simple questions in conversations. This paper established the application of discrete trial training that was later popularized by Lovaas (1987).

Discrete trial training (DTT) continues to be the most well-known and extensively studied behavioral approaches in the treatment of ASD (e.g., Matson, Benavidez, Compton, Paclawskyi, & Baglio, 1996; National Autism Center, 2011; What Works Clearinghouse, 2010; Vismara & Rogers, 2010; Wong et al., 2013). In DTT, learning is facilitated by breaking down complex tasks into small units and presenting them in a repeated manner until skill acquisition is demonstrated (Lovaas, 2002; Smith 2001). It involves five components: (a) presentation of an instruction (b) optional presentation of prompt, (c) occurrence of a learner's response, (d) delivery of consequence, and (e) presentation of an inter-trial interval (Lovaas, 1981, 2002; Williams & Williams, 2011). DTT offers clarity of instructions, expectations, response, and feedback and benefits children with ASD who often require explicit instructions. Studies have shown that DTT is remarkably effective in teaching imitation, language, play, social, cognitive, and self-help skills to people with ASD across the life span (Lovaas, 1987; Matson, Benavidez, Compton, Paclawskyj, & Baglio, 1996; Rogers & Vismara, 2008; Smith, 2001; Wong et al. 2013).

Although many scholars have added to the research and knowledge base of behavioral intervention for people with ASD, the work by Lovaas changed the way that researchers and consumers viewed both applied behavior analysis and autism treatment (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; National Research Council, 2001). In 1987, Lovaas published his work of *The University of California at Los Angeles (UCLA) Young Autism Project* (Lovaas,

1987). The first phase of the project began in 1970 and ended in 1984. The behavior intervention project focused on providing intensive behavioral treatment to young children below the age of four with autism. Discrete trial training was the primary method of instructional delivery and was used to teach a variety of skills including language, early cognitive, and self-help skills. Nearly 50% of the children in the experimental group, who received 40 hours of one-on-one behavioral treatment per week for two years, attained scores within the average range of intellectual and educational functioning by seven years of age. They were also found to be indistinguishable from typically developing children, as opposed to only 2.5% in the control group in reaching such a favorable outcome. Lovaas' work laid out the foundation for future autism research, and his findings supported that ASD was amenable to specialized treatment.

The results of this study changed the perception of researchers, policy makers, and consumers about the trajectory of possible outcomes for people with ASD. One of the most visible results the *UCLA Young Autism Project* has been the establishment of research in early intensive behavioral intervention (EIBI; Vismara & Rogers, 2010). Researchers and practitioners generally agree that EIBI is a highly effective form of treatment for early childhood autism (Eikeseth, 2009; Hayward, Eikeseth, Gale, & Morgan, 2009; Matson, Tureck, Turygin, Beighley, & Rieske, 2012). Children under the age of five who received EIBI have demonstrated substantial gains in IQ, adaptive behaviors, socialization, communication, and daily living skills (Reinchow, Barton Boyd, & Hume, 2014). Effective EIBI should include the following components (Eikeseth, 2009; Lovaas, 1987; Reinchow & Wolery, 2009): 1) one-on-one instruction in a highly structured setting for 25 to 40 hours per week, 2) instruction to target systematic transfer to natural settings to promote generalization and maintenance, 3) individualized instruction to address core deficits of ASD and challenging behaviors, and 4)

training and support to promote family involvement including treatment planning and delivery. The effectiveness of EIBI has offered promising quality outcomes for children with ASD and their families (National Research Council, 2001).

The accumulating evidence that supports the benefits of EIBI for children with ASD has pushed for policy advocacy and insurance reform to cover ABA treatments (Ursitti, 2008). The Surgeon General endorsed the efficacy of applied behavioral methods in reducing inappropriate behaviors and in increasing communication, learning, and appropriate social behaviors for individuals with ASD (National Institute of Mental Health, 1999). In 2001, Indiana became the first state to mandate insurance coverage for individuals with ASD (Trivedi, 2001). Forty-one more states and the District of Columbia have since then passed the autism mandate in the past 15 years (National Conference of State Legislatures, 2015). The mounting evidence of EIBI has changed the landscape of insurance, and in turn, increased accessibility to effective evidence-based treatments for families affected by ASD.

Qualifications and Roles of Paraprofessionals

The rise of the number of children diagnosed with ASD and recent mandate of insurance coverage for ABA services have created a huge demand for professionals and paraprofessionals who are trained to work with children with ASD, particularly those who are prepared and credentialed to work in community-based agencies providing ABA services. Such services include provision of one-on-one intervention in either a clinic or the child's home (Behavior Analyst Certification Board, 2014; Leaf, Taubman, McEachin. Leaf, & Tsuji, 2011). Most ABA programs employ a tiered service-delivery model (2014). Typically, a child's treatment program is designed and supervised by a professional, often a Board Certified Behavior Analyst (BCBA), who has extensive years of training in ABA and experience working with children with ASD.

The paraprofessional, commonly known as behavior technicians or behavior/ABA therapists, delivers treatment protocols under the supervision of a BCBA (2014).

While there are graduate programs in applied behavior analysis, strict qualifications for BCBAs, and governing body to regulate the conduct of BCBAs, the qualifications and requirements for behavior therapists (i.e., the people working face to face with the children with ASD) are less defined. These individuals are primarily responsible for delivering the majority of intervention, yet, there are no standards in place to monitor and evaluate their practice. Insurance companies and government agencies requested and sought ways to improve and standardize behavior services by frontline staff. For example, when Tricare, which is the insurance carrier for military families, first launched the Autism Care Demonstration Project which covered ABA treatment, they required the therapists to have completed at least 40 hours of ABA classroom training and received ongoing supervision from a BCBA (Department of Defense, 2002). Seeing this growing issue of the lack of regulations of paraprofessionals providing ABA services, the Behavior Analyst Certification Board (BACB) has recently introduced a credential program for paraprofessionals who deliver ABA intervention.

The eligibility requirements for registered behavior technician (RBT) include five areas. First, the RBT must be at least 18 years old and demonstrate completion of high school or equivalent or higher. Second, the RBT must demonstrate 40-hour training designed to introduce ABA knowledge. Third, the BCBA responsible for the supervision of the RBT must observe and assess his/her competency in demonstrating ABA techniques. Fourth, the RBT must successfully complete a criminal background check. Last, the RBT must take and pass an examination. To maintain the status of the certification RBT must receive ongoing supervision by a BCBA and comply to the BACB's Professional and Ethical Compliance Code for Behavior Analysts

identified as relevant for RBTs. The RBT credential program is a first step toward establishing a quality control of paraprofessionals practicing ABA and working with children with ASD.

Paraprofessionals, whether they are working in the school or in the home, have similar pedagogical roles in supporting, teaching, and interacting with children with ASD. The most important role of paraprofessional is the implementation of the child's instructional and behavior support programs with fidelity (Hall, Grundon, Pope, & Romero, 2010; Leblanc, Ricciardi, Luiselli, 2005; Robinson, 2011). In an EIBI program, between 25 and 40 hours of one-on-one instruction is delivered by paraprofessionals. In addition, paraprofessionals are also expected to manage challenging behaviors and implement behavior intervention plan (Young, Simpson, Myles, & Kamps, 1997). Probably the least mentioned role of paraprofessional is to also be a "data manager" (Boomer, 1994). Paraprofessionals are required to not only manage data, but they also need to be sure they are collecting reliable and valid data. An effective behavior analytic program requires reliable and consistent measurement of child's behaviors so that data-based decisions could be made for program modification or data could be used to inform child outcomes. The management of the information system regarding the child's day-to-day performance falls on the shoulders of the paraprofessionals.

Challenges of Home-Based Therapists

Despite the similarity with the roles of school-based paraprofessionals, home-based therapists face additional demands related to their unique roles and responsibilities. In addition, due to the amount of time these paraprofessionals spend in a home, they encounter a different set of clinical and ethical challenges. As the prevalence of ASD continues to increase and insurance benefits make EIBI accessible to a wide range of families, the number of children with ASD receiving home based EIBI continues to increase. However, there is little documentation of

understanding the distinctive roles and responsibility and unique challenges these home-based therapists are presented with. Supervision strategies and supports specifically for this group of paraprofessionals are also not studied extensively.

Several work-related factors are uniquely experienced by home-based therapists but not other paraprofessionals who work in the school or in a clinic. Travel demands are high and can easily contribute to burnout. Unlike staff working in a school or a clinic, home-based therapists spend their breaks traveling to the next client's home. The working environment can also be unfamiliar and less predictable. For example, home-based therapists may have to deal with issues such as cleanliness, distractions, and interruptions in the home. Working with someone's child in their home may also mean that behavior therapists are expected to follow house rules and adapt to different cultural practices, which may create feelings of discomfort (Macchi, Johnson, & Durtschi, 2014).

Home-based therapists are also presented with ethical challenges not otherwise commonly experienced by paraprofessionals working in a non-home environment (Worth & Blow, 2010). These individuals spend a majority of the time in the child's home providing services to the child but also support to the family. They may observe inappropriate or dangerous behaviors that make them feel uncomfortable, or witness parenting strategies which they disagree. Boundary violations are also concerns in the home context. These may include caregivers or therapist's oversharing of personal matters, taking gifts, or client's asking awkward questions. As the child's family becomes more familiar with the therapists, they may develop a close bond and dual-role relationships such as attending personal events or exchanging communication unrelated to the child's intervention program. Despite agencies may have policy

to address these issues and set boundaries with the families, it is up to the therapists to enforce these rules.

The main challenge home-based behavior therapists face, however, is the time they spend in an isolated work setting, receiving little support from their coworkers and supervision from their supervisors (Worth & Blow, 2010). They are asked to not only teach but also to manage challenging behaviors such as task refusal or aggression, all done alone without the immediate guidance from their supervisor. This issue is exacerbated particularly for behavior therapists who are relatively inexperienced and less skillful in problem solving independently. Reliance on them to manage challenging situations is a safety concern to both the child and the therapist, not to mention the level of stress added to the therapists.

Home-based behavior therapists are faced with a multitude of challenges while providing EIBI services to children with ASD in their homes. Attrition rate is high and feeling of burnout is often experienced among behavior therapists (Symes, Remington, Brown, & Hastings, 2006). Ongoing supervision is critical in making sure they are well supported in their work environments. Children with ASD also present unique challenges such as impairments in social communication and presentation of repetitive and restrictive behaviors not otherwise presented in other developmental disabilities. It is paramount that home-based behavior therapists receive high level of ongoing support to ensure they are implementing the child's specialized and individualized intervention with fidelity.

Treatment Integrity

While we have 50 years' worth of evidence-based treatments for children with ASD, the quality of these treatments cannot be evaluated without considering the fidelity with which an intervention is implemented. The effectiveness and intensity of any intervention are dependent

on the quality of the implementation. As Fixsen, Blase, Horner, and Sugai (as cited in Cook & Odom, 2013) noted, "choosing an evidence-based practice is one thing, implementation of that practice is another thing altogether." The issue of treatment integrity is particularly pertinent to practitioners of applied behavior analysis in the treatment of ASD. Poorly implemented treatment can compromise the effectiveness of the treatment and will fail to produce desirable child's outcomes. Poorly implemented interventions also have an impact on estimates of treatment intensity or dosage.

Treatment integrity, or implementation fidelity, is the degree to which a treatment or intervention is implemented as planned, designed, and intended (Fryling, Wallace, & Yassine, 2012; Gresham, Gansle, & Noell, 1993). Precise implementation is necessary for demonstrating the functional relationship between treatment and treatment outcome, that is, the treatment is effective in producing behavior change (Perterson, Homer, & Wonderlich, 1982). There are four components to consider when evaluating treatment integrity: quantity, process, quality, and content (Sanetti & Kratochwill, 2009). Quantity of a treatment describes how much of treatment should be provided and process refers to how the treatment is delivered. The quality of treatment describes how well the treatment is delivered. Factors such as the instructor's level of experience, the level of complexity of the intervention, or the amount of resources available will all affect the quality of the implementation of intervention. In addition, the quality of an intervention is largely dependent on how well the intervention steps are described i.e. content. For example, Fazzio, Arnal, and Martin (2010) developed a self-instructional manual for teaching individuals to apply discrete trial teaching (DTT) to children with ASD. The manual provided step-by-step instructions on how to correctly implement DTT, and its effectiveness was

validated in multiple studies (Thiessen et al., 2009; Thomas et al., 2012). This kind of manualized method will ensure accuracy, consistency, and uniformity of the treatment.

Ensuring treatment is implemented with fidelity is especially a challenge for behavior therapists who provide one-on-one intervention in the child's home with minimal supervision. Unlike paraprofessionals working in a classroom, home-based behavior therapists are not observed and provided with feedback as frequently. Despite the child may receive 30 hours of intensive therapy per week, one cannot conclude that the intensity aspect of behavior intervention has been met without making sure that all 30 hours are spent on engaging in evidence-based practices and high quality intervention. Behavior therapists who are relatively inexperienced may spend more time on setting up a session, preparing instructional materials, or collecting data. During one-on-one interaction, inexperienced behavior therapists may also miss valuable teaching opportunities (Robinson, 2011). Without proper training and support, they are more likely to engage in practices that are not evidence-based (Paynter & Keen. 2015). Any time spent on engaging in these activities reduces the intensity and compromises the quality and integrity of the treatment.

The reliance on minimally trained and inexperienced paraprofessionals to provide a bulk of instruction to children with ASD poses serious threat to treatment fidelity and effectiveness of ASD intervention. Home-based therapists require additional training and ongoing supervision to ensure they are implementing intervention as it is planned, designed, and intended (Fryling, Wallace, & Yassine, 2012; Gresham, Gansle, & Noell, 1993). Maintaining treatment integrity is as vital as using empirically supported practices in the treatment of ASD. Providing training and on-going coaching to paraprofessionals working with children with ASD can drive the success of achieving treatment integrity (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). The current

literature on professional development offers promising research on evidence-based training and coaching practices. The recent dramatic growth in the use of paraprofessionals to provide intensive behavioral intervention for children with ASD warrants further research in the area of professional developments for paraprofessionals, particularly ones who provide home-based ABA intervention or require remote supervision.

LITERATURE REVIEW

Professional Development Literature

Paraprofessionals have long been employed to provide instruction for children with ASD in the school and clinical settings. The shortage of paraprofessionals who are appropriately trained is well-documented and consistently acknowledged in the professional literature. Traditional training approaches, such as one-time lecture, in-person workshop, or group discussion, are not sufficient and effective to produce sustaining changes of teaching behaviors in the applied setting; and they certainly are limited in promoting positive child outcomes (Fixsen, Naoom, Blase, Friedman, & Wallance, 2005; Pianta, 2006). With the increasing needs for paraprofessionals to provide behavioral intervention for children with ASD, evidence-based training and coaching practices must be identified; and such practices should also be time and cost effective.

Behavioral Skills Training (BST). One prevailing approach of professional development considered as evidence-based practice is behavioral skill training (BST; Reid, Parsons, & Green, 2012). BST aims to teach new skills to individuals through a step-by-step training protocol which includes the components of instruction, modeling, role play, and feedback (2012). BST represents both a performance and competency-based approach. It is a competency-based approach because a criterion for which a behavior is adequately performed is established, and training is continued until the criterion is achieved. It is also a performance-based approach because the trainee is required to perform the skills being taught. BST has been show to be effective to teach instructors a variety of skills such as mand training (Nigro-Bruzzi & Sturmey, 2010), preference assessment (Roscoe & Fisher, 2008), and functional analysis conditions (Iwata et al., 2000).

In a study by Nigro-Bruzzi and Sturmey (2010), six teachers were taught to use mand training to teach requesting to six children with ASD. Written descriptions on how to implement a seven-step mand training protocol were provided to each teacher during baseline. Data were collected on teacher's accuracy of mand training implementation. Training started after baseline data were collected, and each teacher received multiple 30 to 60 minutes training session where the experimenter reviewed the protocol and showed a video-model. The teachers participated in a role-play activity where they rehearsed the skill, and immediately received feedback from the experimenter. Rehearsal and feedback were repeated until proficiency was demonstrated. Results indicated that five out of the six teachers who received behavior skills training from the experimenter demonstrated accurate implementation of mand training protocol and they maintained the skill at a similar level in post-training. This study also demonstrated that improved instructional skills (i.e. mand training) was effective in increasing child participant's requesting.

Sarokoff and Sturmey (2007) also were successful at training staff at a small school for children with ASD to use discrete trial teaching. The experimenter first reviewed a written list of 10 components of DTT with the staff in an office, and after that the staff practiced DTT with an assigned child in the classroom while the experimenter observed. The experimenter delivered immediate feedback after each rehearsed trial. Verbal feedback included positive comments on target components performed correctly, and corrective feedback on components performed incorrectly by the teacher. When the staff performed a component incorrectly, the experimenter provided a model for a few times and immediately had the teacher rehearsed again. The results of this study showed that BST was effective in producing an increase in all three teachers, and

the researchers also found that correct use of DTT resulted in concomitant improvements in child behavior.

Performance Feedback. One relatively promising strategy for changing teaching behavior in an applied context is performance feedback. In performance feedback interventions, individuals providing instruction are observed and given information and data about their implementation of an intervention, in an effort to enhance their teaching practices and improve treatment fidelity (Arco, 2008). Common types of performance feedback used with instructors are verbal and written, (Codding, Feinberg, Dunn, & Pace, 2005) and these types of feedback are used to teach a variety of new skills to teachers (Kaiser, Ostrosky, & Alpert, 1993; Leblanc, Ricciardi, Luiselli, 2005; Mudd & Wolery, 1987). Verbal feedback has also been adopted in training packages such as behavioral skill training to train teachers to implement functional analyses (Moore et al., 2002).

In a study by Barton and Wolery (2010), teachers were given a manual to study about teaching pretend play to children with disabilities. The first phase of training required the teachers to read the manual and practice using contingent imitation and system of least prompts with a confederate child, and they received verbal feedback for their teaching. The second phase of training required them to work directly with their student and implemented the same teaching procedures. After each teaching session, the researcher provided verbal and written feedback to the teachers. The results of this study supported the effectiveness of verbal and written feedback in teaching teachers to use contingent imitation and system of least prompts; and as a result, all students demonstrated an increase in the number of pretense behaviors after intervention.

Another common type of feedback utilizes graphs or visual display of quantitative information to inform teaching performance (Leach & Conto, 1999). When using graphical

feedback, teacher behavior is counted or timed and data are transferred and displayed on a graph. Feedback about performance is given verbally or in writing (Barton, Kinder, Casey, & Artman, 2011). In one study, interval data of teachers' use of incidental teaching with their preschool students were graphed and reviewed by the teachers on a daily basis. This type of feedback was successful at increasing the teachers' use of incidental teaching in the classroom (Casey & McWilliam, 2008). In a study by Leach and Conto (1999), they investigated whether process feedback and outcome feedback would produce differences in teacher behaviors. Process feedback referred to feedback to teachers regarding their own teaching behaviors and performance, whereas outcome feedback referred to feedback to teachers about their student's behavior and performance. The results indicated that teachers did not improve their quality of teaching after initial training, but they improved substantially after receiving graphical feedback. The type of feedback, process or outcome, did not matter in their effectiveness in changing the teacher behaviors.

Telepractice. Although the aforementioned types of performance feedback provide robust evidence for their effectiveness in improving teaching behavior, they can be time consuming and require delivery of feedback in real-time. When considering many families are receiving behavioral health services in rural area and trained providers are limited, research is needed to explore other forms of performance feedback that is not only effective and efficient, but also sustainable, usable, feasible, and portable (Gross, Duhon, & Doerksen-Klopp, 2014). As technology becomes more accessible, the internet has provided just the platform for effective and efficient coaching.

Telepractice uses communication technologies such as online training, videoconferencing to deliver training and performance feedback to individuals in geographically remote locations

(Neely, Rispoli, Gerow, & Hong, 2016). It has been used to teach parents and providers working with children with ASD a variety of skills, such as naturalistic language intervention (McDuffie et al., 2013), discrete trial teaching (Hay-Hansson & Eldevik, 2013), functional communication training (Suess et al., 2014), and preference assessments (Machalicek et al., 2009). A telepractice training program typically includes online instruction and immediate feedback provided via videoconferencing. For example, in a study by Hamad, Serna, Morrison, and Fleming (2010), the online instruction included interactive learning activities and video models and exemplars to teach various behavioral intervention techniques, such as reinforcement and prompting, to families and service providers. Heitzman-Powell and colleagues (2014) also used online instruction to teach academic knowledge of Applied Behavior Analysis, and added a live distance coaching component to deliver performance feedback via videoconferencing to improve participants' implementation of practices.

Neely and colleagues (2016) evaluated the use of telepractice to train three undergraduate students working in a university-supported autism clinic to implement incidental teaching procedure with preschool children with ASD. The telepractice training package included an online training module, self-evaluation, and video-based performance feedback delivered via videoconferencing. The interventionists first completed an online module on naturalistic instruction and took the module's post assessment. The interventionists then videotaped five minutes of instruction and submitted the video to the trainer. Both interventionist and trainer reviewed the videotaped session and evaluated the video using a self-evaluation sheet. They then scheduled a time to meet via videoconference and compared notes of the evaluation sheet. The trainer provided delayed feedback during the video conference. The results indicated that the training package was effective in increasing incidental teaching opportunities by the

interventionists, and with delayed feedback and self-evaluation, the interventionists were also able to maintain fidelity of implementation.

E-mail feedback. Telepractice offers promising way to promote training and coaching to consumers of applied behavior analysis who have limited access to high quality providers due to remote geographical location. Large scale telepractice, such as those studies described above, often incurs a substantial initial cost to set up and develop online modules and maintain a web-based platform for training and videoconferencing to take place. Another limitation of telepractice is accessing to technology could be challenging in many rural areas and may require specific software installation from the users (Heitzman-Powell, Buzhardt, Rsinko, & Miller, 2014). Electronic mail, on the other hand, is a ubiquitous and economical kind of technology that serves as a viable alternative to deliver performance feedback. Several studies have examined the effect of using feedback delivered via e-mail as a stand-alone strategy or as part of a multicomponent PD package to improve teaching behaviors (Artman-Meeker & Hemmeter, 2012; Barton, Fuller, & Schnitz, 2015; Barton & Wolery, 2007; Barton, Pribble, & Chen, 2013; Hemmeter, Snyder, Kinder, & Artman, 2011; Oborn & Johnson, 2015).

Stand-alone practice. Barton and Wolery (2007) delivered e-mail feedback to six preservice teachers on their use of verbal behaviors including expansion and descriptive praise with children in two reported studies. Live-observation was conducted by the researchers and weekly feedback was provided via e-mail within the same day of observation. Each e-mail contained a random selection of verbatim examples from the observation, frequency counts of expansions and descriptive praise, and an embedded question to prompt a response from the preservice teachers. Results supported the effectiveness of e-mail feedback in increasing preservice teachers' use of verbal behaviors, but when feedback was given on expansion only,

the impact was greater than when feedback was given on both expansion and descriptive praise. Two later studies (Barton, Fuller, & Schnitz, 2015; Barton, Pribble, & Chen, 2013) expanded on the effectiveness e-mail feedback as a stand alone practice to improve discrete and self-selected teaching behaviors in preservice teachers.

Multicomponent PD package. Three studies included training and e-mail feedback in a multicomponent PD package. Artman-Meeker and Hemmeter (2012) used e-mail feedback to increase preschool teachers' use of classroom preventive practices and examined whether the preventive practices were associated with a decrease in instances of challenging behaviors for students with mild problem behaviors. Preventive practices included the use of transition preparation, rule reminders, and social-emotional strategies. A multiple baseline across behaviors (i.e. preventive practices) design and replication across teaching team were used. Teachers first received a brief training on the use of preventive practices. Upon training, their teaching was videotaped and reviewed by the researcher who provided feedback via e-mail. E-mail feedback took place an average of 2.2 times per week, and consistently included a friendly greeting, data on the teachers' use of preventive practices and the target child's challenging behaviors, examples and praise of correct use of the preventive practices, suggestions to improve the practice, and an embedded response prompt. This study found that e-mail feedback was associated with an increase in teachers' use of preventive practices, but the effects of the preventive practices on children's challenging behaviors were mixed. Hemmeter and colleagues (2011) evaluated whether Head Start teachers' use of descriptive praise would increase following a professional development intervention that included a brief training, observation of large-group classroom activities by a trainer, and receipt of e-mail feedback. Using a multiple-probe across participants design, teachers received training on the use of descriptive praise and an average of

three times per week of feedback delivered via e-mail. The e-mail feedback protocol was similar to the one described previously, and in addition, teachers were also given a link to watch a video example of other teachers' use of descriptive praise. Results indicated that all teachers increased their use of descriptive praise following training and performance feedback, and maintained their performance over time. Performance feedback delivered via e-mail was also found to be acceptable to the teachers.

Oborn and Johnson (2015) evaluated the effects of workshops and e-mail feedback on Part C home visitors' use of caregiver coaching strategies and range of routines utilized during home-based intervention. In the multicomponent PD package, the home visitors received two one-on-one workshops, which included PowerPoint presentation, self-reflection activities, observation of video examples and discussion, modeling, and practice followed by reflection. Upon completion of the workshops, home visitors who demonstrated below-criterion proficiency of caregiver coaching strategies received additional six weeks of performance feedback sessions. Feedback was delivered once per week via e-mail based on evaluation of videotaped sessions, and home visitors were provided both written and graphical feedback. The study suggested that when ongoing support was in place via delivery of performance feedback, home visitors were able to use a range of caregiver coaching strategies.

To date, Oborn and Johnson's study (2015) was the only study that extended the context beyond a school setting. Part C home visitors share similar working conditions and challenges home-based therapists encounter, in ways such as working in an isolated environment with limited immediate access to supervisors and colleagues. The use of video-based observation and delivery of performance feedback via e-mail is a viable tool to improve therapists' teaching

behaviors, and is also an efficient tool to reduce barriers imposed by time and proximity often experienced by home-based therapists.

Instructive Feedback Literature

Children with autism spectrum disorder (ASD) present unique learning needs and require intensive and individualized intervention (National Autism Center, 2011). Many learners with ASD requires high numbers of learning opportunities to acquire new skills. Although discrete trial teaching is a well-established evidence-based teaching practice for learners with ASD (Lovaas, 1987; Wong et al., 2013), it is paramount to identify procedures that will increase the efficiency of this teaching practice.

Instructive feedback (IF) is a modification of systematic instruction that involves an additional presentation of non-target stimuli to the consequent events of instructional trials on target behaviors (Werts, Wolery, Holcombe, & Gast, 1995). During instruction, the instructor presents the target stimulus, waits for the student's response, delivers the consequence, and presents an additional stimulus (i.e. instructive feedback stimulus). The student is not expected to respond to the IF stimulus, and if a student response does occur, no consequence is provided by the adult. Studies have found that students acquired a percentage of non-target behaviors through the presentation of instructive feedback in conjunction with the direct instruction and programmed consequence of the target behavior (Gast, Doyle, Wolery, Ault, & Kolenda, 1994; Holcombe, Wolery, Werts, & Hrenkevich, 1993; Loughrey, Betz, Majdalany, & Nicholson, 2014; Reichow & Wolery, 2011; Werts, Caldwell, Wolery, 2003; Werts, Hoffman, & Darcy, 2011; Wolery, Holcombe, & Frederick, 1993; Werts, Wolery, Holcombe, & Vassilaros, 1992). When students did not acquire all of the IF stimuli, IF procedure still facilitated a more rapid rate

of acquisition of the IF stimuli when taught directly (Holcombe et al., 1993; Wolery et al., 1991). These benefits make instructive feedback a desirable and efficient instructional method.

There are three variations of IF stimuli in terms of their relation to target stimuli: expansion, parallel, and novel (Werts, Wolery, Holcombe, & Gast, 1995). With expansion, the target stimuli and IF stimuli are different from each other but conceptually related. For example, if the target stimuli are sight words and the students are required to read the words, the IF may include spelling of the words (Gast, Dolyle, Wolery, Ault, & Baklarz, 1991). In parallel IF, the IF stimuli require the same responses as the target stimuli. For example, if the target stimuli are Arabic numerals (e.g., 1, 2), the IF may be naming the corresponding number words (e.g., one, two) or the Roman numerals (Holcombe et al., 1993). Novel IF stimuli require responses that are different from one another, are from a different curricular domain, and are not conceptually related. For example, if the target stimuli are shapes of different colors and the students are required to name the shapes, the IF stimuli are the colors of the shapes (Werts, Wolery, Holcombe, Vassilaros, & Billings, 1992).

Instructive feedback is effective in facilitating learning without direct instruction for students from preschool to adolescents and with a wide range of disabilities and levels of severity (Werts et al., 1995). It is also effective in multiple settings including one-one-one (Wolery et al., 1991), small group instruction (Ledford, Gast, Luscre, & Ayres, 2008), and independent seat work (Caldwell, Wolery, Werts, & Caldwell, 1996). In a study by Reinchow and Wolery (2011), they extended the IF research by comparing the effect of progressive prompt delay with IF to progressive prompt delay without IF when teaching children with ASD to read sight words. Results indicated that both conditions produced skill acquisition but when IF was used, the children learned the sight words two times faster.

Vladescu and Kodak (2013) also conducted a study using instructive feedback with children with ASD. They compared whether presentation of IF stimuli as an antecedent (i.e. before presentation primary target) or as a consequence event (i.e. after delivery of reinforcement for response for primary target) would produce differential effects but concluded that both methods produced similar outcomes, that is, the children learned similar amount of IF stimuli without explicit instruction in either condition. This study provided additional evidence to support the use of instructive feedback as an efficient teaching strategy for children with ASD.

Research Questions

Paraprofessionals have a rather critical role in educating children with ASD. Yet, they are often faced with the challenges of working without receiving adequate training and ongoing support. Behavior therapists who provide EIBI services in the home setting are presented with additional difficulties while often working alone and under limited clinical support. The burgeoning literature on the use of e-mail feedback offers practitioners an alternative professional development tool that is effective, efficient, and economical to improve teaching practices for paraprofessionals.

The purpose of the present study is to evaluate the effects of performance feedback on improving behavior therapists' use of IF with children with ASD during one-on-one instruction. The promising evidence of IF to improve the efficiency of instruction is particularly favorable to learners with ASD who often require high numbers of learning opportunities to acquire new skills (National Research Council, 2001). The research questions addressed in this study are:

1. Will a training package including didactic training and feedback delivered via e-mail based on videotaped work samples affect behavior therapists' use of IF?

2. Will ABA therapists be able to generate unique IF stimuli, different from those used in training?

3. Which type of IF will be most frequently used by behavior therapists?

Method

Settings and Participants

Settings. A local behavioral health agency that provided in-home and center-based services for children with Autism Spectrum Disorder (ASD) agreed to participate in this study. All sessions with children were recorded and data were collected from the video recordings. All videos were recorded in the same setting where the child participants typically received therapy sessions, which could be their home, school, or the center. The experimenter reviewed all videos and emailed adult participants feedback at her office, and adult participants reviewed all emails at their own home while making sure no other non-study related personnel was able to access the videos or e-mails.

Adult participants. Behavior therapists were selected if they met inclusion criteria, which were: (a) employment at the agency for at least three months, (b) maintaining a minimum of 25 hours per week of providing direct intervention, (c) demonstrating the ability to implement discrete trial training with fidelity. Four therapists met inclusion criteria and were selected to participate in this study. Table 1 shows the demographic information for each behavior therapist participant and the child each worked with during the course of this study. All adult participants were female, aged between 23 and 39 years. Courtney, Kristy, and Molly had a bachelor's degree in psychology except Amy who had a bachelor's degree in anthropology. Three participants, Courtney, Kristy, and Molly were first exposed to applied behavior analysis (ABA) and gained their experience working with children with ASD through their employment at the

participating agency. Their length of employment and number of years of experience in ABA and instruction for children with ASD ranged from one year and three months to three years. Amy, on the other hand, had the most experience in working with individuals with ASD. She had worked with individuals with ASD for eight years, and for the past three years she had been working as a behavior therapist.

All study phases took place in the same setting where the adult participants typically worked in, which was also the place where the child participants received therapy. Courtney worked with two children throughout this study, one in the child's home and another one in the center. Both Kristy and Amy worked with one child consistently until the end of the intervention phase, and switched to a new child in the maintenance phase due to changes in their caseloads. Amy worked with the first child in his school and the second child in the clinic; whereas Kristy worked with the first child in his home and the second in his school. Molly worked with the same child throughout all phases of this study in his home except during generalization phase, she added a second child and worked with him in his home.

Child participants. Adult participants identified potential child participants from their current caseload. The children's parents were given recruitment materials including information describing the study and a consent form by the adult participants. Each adult participant selected two children for this study, and a total of seven child participants, six boys and one girl, were selected. One boy worked with two adult participants. These children aged from three to eight years old, all diagnosed with ASD, and were receiving ABA services at least once per week provided by the adult participant. These children were selected because they all had at least two language goals targeting receptive and/or expressive language skills in their current intervention plan. Examples of appropriate language goals included function-feature-class identification,

preposition identification, and answering social questions. Language skills were targeted because the current literature of instructive feedback strongly supports its effectiveness in improving children's language skills. Because data were not collected for individual children, no further child-specific information was obtained. In addition, child participants did not receive intervention nor their intervention plan was altered as a result of participation in this study. Their therapy schedule, frequency, and service location also remained unchanged.

For the subsequent sections of this paper, adult participants will be referred to as "participant" and child participants will be referred to as "child."

Experimental Design

A multiple baseline design across four participants was used to evaluate the effectiveness of training and e-mail feedback on behavior therapists' use of IF with children with ASD. Baseline took place for each participant for at least three sessions. Stability of baseline data was established when shifts in level or trend of the graphed data through visual analysis were absent. Once a stable baseline was established, training and e-mail feedback intervention was implemented, while the rest of the participants continued baseline. When a marked effect (i.e. shift in trend or level) was observed in the first participant's use of instructive feedback, training and e-mail feedback intervention was then introduced to the second participant who had demonstrated stable baseline, and the same logic followed for the subsequent participants.

Table 1

Adult and child participant demographic information

	Courtney	Molly	Amy	Kristy
Gender	Female	Female	Female	Female
Age	24	23	27	39
Ethnicity	Caucasian	Hispanic	Chicana mixed	Caucasian
Highest degree earned, major	B.A., Psychology	B.A., Psychology	B.A., Anthropology	B.A., Psychology
Years of experience in Applied Behavior Analysis	1.25	2	3	3
Years at current ABA therapist position at participating agency	1.25	2	1.5	3
Years of experience of working with individuals with Autism Spectrum Disorder	1.25	2	8	3
Child Participants worked in this study				
Child 1	Kelsey	*Leon	Dylan	Henry
Age (years)	9	8	6	6
Gender	Female	Male	Male	Male
Programs targeted for IF	Sight word reading, answering wh questions, action identification,	Identification of numbers, objects, emotions, colors; sight word reading, answering personal information, class identification	Answering wh questions, gestures, preposition identification, counting, answering personal information, preposition identification, pronoun identification	Identification of shapes, colors, body parts, emotions, familiar people, animal sounds, actions

(continued)

Table 1. Adult and child participant demographic information (continued)

	Courtney	Molly	Amy	Kristy
Child 2	Kelvin	Brian	*Leon	Bradley
Age (years)	3	3	8	4
Gender	Male	Male	Male	Male
Programs targeted for IF	Phonics identification, object identification, answering wh questions	Object identification	Sight word reading, number identification, identification of familiar people, answering personal information	Letter identification, shape identification

Note. Molly and Amy worked with the same child, Leon, in different phases during this study.

Procedure

Recruitment. After gaining approval from the Institutional Review Board, the experimenter contacted the director of the agency to identify potential behavior therapists. The director distributed the recruitment materials to potential behavior therapists, who contacted the experimenter if they were interested in learning more about the study. The experimenter scheduled phone calls with interested behavior therapists to share study requirements and answer questions. If, after that phone call the behavior therapists were still interested in participating, they returned their consent form to the experimenter. Behavior therapists who turned in their consent form were contacted by phone and instructed to submit a short video within a week for evaluation of teaching competency. The video required the therapists to record at least 30 instructional trials that involved teaching of receptive and/or expressive language tasks using discrete trial teaching. To be selected as participants for this study, the therapist must score 80% correct or above on the competency checklist (see Appendix A) and demonstrate the use of instructive feedback less than four times out of the first 20 instructional trials (i.e. 20% of total trials). Behavior therapists who scored below 80% or demonstrated the use of IF more than 20% of the instructional trials were disqualified from this study. Disqualified therapists were notified via e-mail. A total of four participants were selected and contacted via phone for further instruction to proceed with the study.

Orientation. The experimenter conducted a one-hour face-to-face orientation meeting with all four participants to review the study procedures and video submission guidelines. Participants were given an opportunity to ask any remaining questions they had regarding the study. During this meeting, the experimenter received a copy of the participants' work schedule and confirmed with each participant the schedules of video-submission and feedback receipt.

Participants were instructed to inform the experimenter when a delay of video submission was expected so that a new submission data would be set. At the end of the orientation meeting, participants were asked to fill out a form to collect their demographic information.

Video recording protocol. Participants already had an iPad provided by the participating behavioral health agency before participation in this study. They were told to record videos of experimental sessions using the iPad throughout this study. Each experimental session video included at least 30 instructional trials that involved the teaching of receptive and/or expressive language tasks using discrete trial teaching. Each participant was assigned a user account to upload the study videos to a password-protected site sponsored by the experimenter's affiliated university and approved by the Institutional Review Board. Videos were submitted at least once but no more than twice a week, and reviewed typically within 24 hours upon submission by the experimenter during all phases of this study except in maintenance and generalization phase. Feedback was provided to each participant via e-mail within 24 hours. Participants were instructed to only submit a video after e-mail feedback had been provided for the previous video. In the events of a long weekend, thanksgiving and Christmas holidays, or planned absence from the child or adult participants, the experimenter delayed sending feedback to the participant until the day before the next scheduled submission. In these cases, the experiment sent a brief e-mail to the participant acknowledging the receipt of the video and alerting her to the later delivery of feedback.

Video practice. All participants were asked to submit an additional video before starting their first baseline session. This video session provided a practice opportunity for the participants to use the video equipment and acclimate both the participants and children to the equipment in order to minimize reactivity before the study. Participants followed the same filming criteria

described above; and the experimenter viewed the video and provided feedback to the participants via e-mail within 24 hours. E-mail feedback for video practice session addressed only the quality of the video. Specifically, the e-mail began with an opening statement thanking the participants for submitting the video, followed by supportive feedback to compliment on the participant's compliance with the filming criteria. The experimenter also provided corrective feedback which included suggestions on improving the quality of the video, such as recording the video in a landscape mode, or moving the iPad farther away so that the child or the teaching materials could be fully captured. Participants were asked to respond to the e-mail confirming the next video submission. The e-mail concluded with an announcement of the commencement of the baseline phase, and a closing statement to thank the participants for their participation in this study. This e-mail feedback protocol followed the same protocol used in the e-mail feedback intervention phase.

Baseline. During baseline, participants submitted two videos per week and received feedback for each video from the experimenter within 24 hours. All communication between the participant and the experimenter was conducted via e-mail. These e-mails followed the protocol described in Hemmeter et al. (2011), except that components specific to giving supportive and corrective feedback were excluded. Components that were included in the baseline e-mails were: a general positive opening statement, filming and video upload question, request for a response, and a positive closing statement. This procedure served three purposes: (a) to establish a relationship between the experimenter and participants, (b) to verify the participants were in the habit of checking and responding to e-mail messages, and (c) to ensure any marked effects were not due to the receipt of e-mail alone. Stability of baseline was first established after three

sessions by Courtney, where her data indicated no evidence of an upward or downward trend. Baseline continued for all three other participants while Courtney received intervention.

Performance feedback training package. Performance feedback training package consisted of a didactic training session and e-mail feedback from the experimenter based on the review of videotaped therapy sessions conducted by the participants.

Didactic training. Following baseline, participants were offered a one-time 60-minute one-on-one training conducted by the experimenter. The experimenter was a Board Certified Behavior Analyst and a doctoral student in special education, who was not associated with and known to the participants and children prior to this study. In the last baseline session, the experimenter included an additional action item to request the participant for confirming the training date and time. Training occurred within three days upon completion of baseline sessions. It was held in a conference room provided by the participating behavioral health agency at a time that was convenient to the participants. Training content was presented using PowerPoint and included the following topics: (a) identifying the types and benefits of instructive feedback, (b) reviewing examples and non-examples of instructive feedback, (c) generating ways to use instructive feedback when given a case scenario, (d) role-playing. At the end of the training, the participants were instructed to record their first session and submit the video following the same protocol used in the baseline session within 72 hours.

E-mail feedback. The session following training, participants filmed and submitted videos following the videotaping protocol described above. The experimenter reviewed the video and provided feedback to the participant via e-mail within 24 hours. The next submission took place only after the participant had received e-mail feedback from the experimenter. As in

baseline, each participant submitted at least one but no more than two videos per week for review.

During this phase, e-mail feedback was similar to baseline, except that the participants received additional feedback regarding their instruction using IF. The contents of e-mail feedback followed the protocol adapted from Hemmeter et al. (2011), which included five components: (a) opening positive statement, (b) supportive feedback, (c) corrective feedback, (d) planned action, and (e) closing comments. Opening positive statements were general statements about the teaching session. Supportive feedback included praise for the participant's correct use of instructive feedback (IF) and data on the amount of instructive feedback used during the instructional session. Corrective feedback statements included a description of instances when IF could have been used. Following corrective feedback, the experimenter suggested follow-up actions that might involve reviewing training materials and/or developing a plan for using IF in future instructional sessions. Before closing, the experimenter also posed a question regarding confirmation of the next video submission, requested a reply via e-mail, and provided an opportunity for the participants to ask questions. The e-mail concluded with a closing comment that was general, positive, and encouraging. Appendix B provides a sample of e-mail feedback with illustration of each component.

Participants received e-mail feedback until they had demonstrated the use of all three types of IF and in 80% of their instruction for two consecutive sessions. The total length of intervention varied depending on each participant's performance. For Courtney, she received e-mail feedback for two sessions, and the total length of intervention was three weeks. Amy received e-mail feedback for six sessions, and completed intervention in three weeks that were spanned across a four-week period due to Christmas holidays. Kristy received e-mail feedback

for four sessions, and intervention lasted for three weeks. For Molly, she received e-mail feedback for five sessions, and she took four weeks to complete intervention. Upon completion of intervention, Courtney and Molly were also introduced to the fading phase which is described in the next section.

Fading of e-mail feedback. The plan was to introduce a fading phase after the participant was able to demonstrate the use of all three types of IF and in 80% of their instructional trials. However, due to an abrupt change of child participants immediately after intervention was completed for both Amy and Kristy, fading phase was only introduced to Courtney and Molly. Fading phase included two additional e-mail feedback sessions. In this phase, Courtney and Molly continued to receive general positive comments about their overall use of IF (i.e. supportive feedback) but did not receive corrective feedback. Planned action items included questions regarding the next video submission and a request for a reply. In the second e-mail, the experimenter notified the participants that it was the end of the intervention phase and they would no longer receive e-mail feedback. The closing comments of this second e-mail included a reminder for the submission of maintenance video.

Maintenance. Participants submitted an additional video at four weeks after termination of the intervention. Two e-mail reminders were sent out to the participants at one week and at two days before the video was due. The experimenter e-mailed the participant confirming the receipt of the video but did not provide any feedback regarding their instruction and use of IF. The purpose of maintenance was to assess whether participants were able to maintain a similar level of IF use in their instruction once feedback had ceased.

Generalization. A generalization probe was conducted after all participants had completed intervention. They submitted another video of their instruction with a different child

whom was not videotaped during baseline nor intervention phase. Since Courtney was already videotaping two different participants throughout the study, generalization was embedded, and therefore, a separate probe was not conducted for her. The video requirement was the same and the experimenter only e-mailed the participant confirming the receipt of the video but did not provide any feedback regarding their instruction and use of IF. The purpose of generalization probe was to allow the experimenter to examine whether the participants were able to maintain a similar level of IF use when instruction took place with a different child.

Data Collection

All the data for this study came from the videotapes submitted by the participants. Using event recording, the experimenter recorded the occurrence of instructional trials that met fidelity standards and yielded a correct or prompted response from the child, which then set the occasion for IF to occur. An instructional trial was said to meet fidelity standard when the participant:

1. Delivered instruction to cue to child's response.
2. Waited for the child to respond OR provided prompts to assist the child.
3. Offered reinforcement for a child's correct response. A correct response occurred when the child provided the correct information in response to the instruction. For example, when a child was shown a figure of a zebra and asked "what is it?" a correct response would be "zebra."
4. Presented an interval of one to three seconds after delivery of reinforcement *and* before the next instructional trial began.

Instructive feedback (IF) was defined as the participant's presentation of a non-target stimulus that did not require a child's response, immediately after a consequent event for a child's correct

response. In other words, it was the non-instructional comments given by the adult participant after the delivery of reinforcement for a child's correct response.

For each occurrence of IF, the experimenter also recorded the type of IF stimuli used. The three types of IF stimuli were *expansion, parallel,* and *novel*, and they were defined in relation to the target stimuli (i.e., the target behavior of the instructional trials). Expansion IF stimuli required responses different from the target stimuli but they were conceptually related, or the IF and target stimuli were from the same curricular domain (Wolery & Collins, 1991). In parallel IF, the target and IF stimuli were different from one another, but the target and IF responses were the same (Werts, Wolery, Holcombe, & Gast, 1995). Novel IF stimuli required responses different from the target stimuli, were from a different curricular domain, and were unrelated conceptually to the target stimuli (Werts, Wolery, Holcombe, & Frederick, 1993). Table 2 provides examples of each type of IF.

Table 2

Examples of Instructive Feedback

Type of IF	Target Stimuli	Child Correct Response	Consequence	Example of IF
Expansion	Participant showed a figure of a zebra and asked "what is it?"	Child said "zebra"	Great job!	Participant commented "zebra has stripes"
Parallel	Participant showed an uppercase "A" and asked what letter?"	Child said "A"	That is "A"	Participant showed a lowercase "a" and commented "this is also an 'a'"
Novel	Participant said "*Put* the frog *on* the lily pad"	Child performed the action	You put it on the lily pad! Hooray!	Participant made a verbal comment "A car is a vehicle"

Inter-observer agreement (IOA)

An observer, who was independent of this study and a graduate student in Applied Behavior Analysis, independently reviewed the videos and collected data on the same variables mentioned above. Prior to the study, the experimenter practiced scoring footage of instructional sessions by individuals not participating in this study until 90% agreement was reached. IOA was assessed a minimum 25% of videotaped sessions across all participants and experimental conditions, and calculated by dividing the number of agreements by the sum of agreements plus disagreements, multiplying by 100. The result of IOA is shown in Table 3. During baseline, IOA was 100% across all participants, which was not surprising because none of the participants demonstrated the use of IF. The average IOA was also high across all participants during intervention phase, ranging from 92% to 100%.

Table 3

Mean percent of inter-observer agreement

		Courtney	Molly	Amy	Kristy
Baseline	Percent Correct	100%	100%	100%	100%
	Use of IF	100%	100%	100%	100%
	Type of IF	100%	100%	100%	100%
Didactic Training	Percent Correct	100%	95%	100%	100%
	Use of IF	100%	85%	100%	100%
	Type of IF	100%	90%	100%	100%
Intervention	Percent Correct	100%	97.5%	97.5%	95%
	Use of IF	100%	97.5%	92.5%	95%
	Type of IF	100%	92%	97.5%	92.5%
Fading	Percent Correct	100%	100%	N/A	N/A
	Use of IF	100%	100%	N/A	N/A
	Type of IF	100%	100%	N/A	N/A
Maintenance/ Generalization	Percent Correct	100%	100%	100%	100%
	Use of IF	95%	95%	100%	100%
	Type of IF	95%	95%	100%	95%

Treatment fidelity

Two fidelity checklists (available in Appendix C & Appendix D) were developed separately for the training and e-mail feedback to ensure these procedures were implemented consistently across all participants. Prior to the first participant receiving training, an independent reviewer verified the training materials presented in the PowerPoint included all the components described in the checklist. During each didactic training session, the experimenter brought the fidelity checklist with her and checked off each component as she reviewed them with the participant. At the end of the training, the experimenter verified that all 11 components were completed before ending the training. Treatment fidelity was 100% for all training sessions, indicating that the experimenter implemented each step of the trainings as designed.

The fidelity checklist for e-mail feedback measured the extent to which the protocol for e-mail feedback was followed as planned. Twenty-five percent of the e-mails was randomly selected using a random number generator method and scored by a graduate student who was not involved in this study. The observer recorded a yes or no on the checklist to indicate if the components of the e-mail protocol were present in each e-mail. The components were: (a) opening positive statements, (b) supportive feedback, (c) corrective feedback, (d) planned action, and (e) closing statements. Treatment fidelity was calculated by dividing the number of components present in the e-mail feedback by the total number of components (i.e., five) and multiplying by 100. Treatment fidelity was 100% for each of the selected feedback e-mails, indicating that all components were present in each of the e-mails reviewed.

Social Validity

At the conclusion of the study, each participant was e-mailed a questionnaire (Appendix E) to complete a social validity questionnaire. Participants rated the effectiveness of the training and e-mail feedback, and perception of instructive feedback.

Results

Overall Use of IF by Participants

All four participants increased their use of instructive feedback after receiving training and e-mail feedback. The results of the rate and type of IF used by each participant are presented below. Figure 1 shows the percentage of IF used by each participant in all study phases. The percentage was calculated by dividing the total number of IF occurrence by the total number of trials eligible for IF (i.e. correct responses within the first 20 instructional trials of the video), and multiplying by 100. Visual analysis of the graphed data was conducted to evaluate the effects of the study training package on instructive feedback. None of the participants demonstrated the use of instructive feedback during baseline, and immediately after didactic training they all showed a noticeable increase of IF use in their instruction.

Courtney began the study without the use of IF in baseline but improved substantially to 58% after receiving didactic training. With only one e-mail feedback session, Courtney showed a remarkable increase in the performance of the target behavior and used IF in 100% of her instruction. This increase in the frequency of using IF was accompanied by an increase in the variety of IF. During these observations she also used all three types of IF. She reached mastery criteria only after two e-mail feedback sessions, which was the shortest among all participants to complete intervention. During fading phase, Courtney continued to maintain a high level of IF use, at 93% and 100%, with only supportive feedback and without any corrective feedback. At one-month follow up, she demonstrated the same high level of IF use in her instruction at 88%.

Molly also demonstrated no use of IF in baseline. She substantially increased the use of IF in her instruction from 0% in baseline to 50% following didactic training. Her performance also gradually improved from 74% to 100% with e-mail feedback and she reached mastery criterion after four e-mail feedback sessions. An e-mail fading procedure was implemented to Molly for two sessions, in which she continued to only receive supportive feedback but no corrective feedback. Molly continued to demonstrate a high level of IF use, at 89% and 94%, in both fading sessions. At one-month follow up, she maintained a similar level of performance at 83%, and demonstrated the use of IF at 91% with a brand new child in generalization probe.

Amy improved substantially, demonstrating 0% use of IF in baseline to 45% after didactic training. However, her use of IF only slightly improved after receiving e-mail feedback following didactic training, and appeared to plateau after three additional e-mail feedback sessions. At the fourth e-mail feedback session, the experimenter focused her feedback more on corrective feedback, but continued to include all other components like any other intervention sessions. The experimenter suggested that Amy take extra time prior to her instructional session to make a list of appropriate IF she could use with her child participant, and use the list as a visual reminder for herself during instruction. Amy followed this action plan and immediately showed a marked increase in her use of IF in her next video (88%), and eventually reached mastery criterion after one more e-mail feedback session. It took Amy a total of five e-mail feedback sessions to complete intervention. At one-month follow-up, she maintained the same high level of IF use at 90% which also served as a generalization probe as Amy worked with a different child participant after intervention due to a change in her caseload.

Kristy received training and intervention after nine stable baseline sessions. Like all other participants, didactic training alone was effective to increase Kristy's use of IF from 0% in

baseline to 25%, though her improvement was less remarkable than the other participants. Kristy showed a steep learning curve and met mastery criteria after only three e-mail feedback sessions. The dramatic increase of IF use by Kristy was also a result of the similar corrective feedback the experimenter gave to Amy on preparing a list of IF targets prior to an instructional session. At one-month follow up, Kristy demonstrated the highest percentage of IF use at 95% among all participants. This follow-up data point was also used as generalization probe as Kristy worked with a different child participant, whom was the same child Amy worked with during intervention.

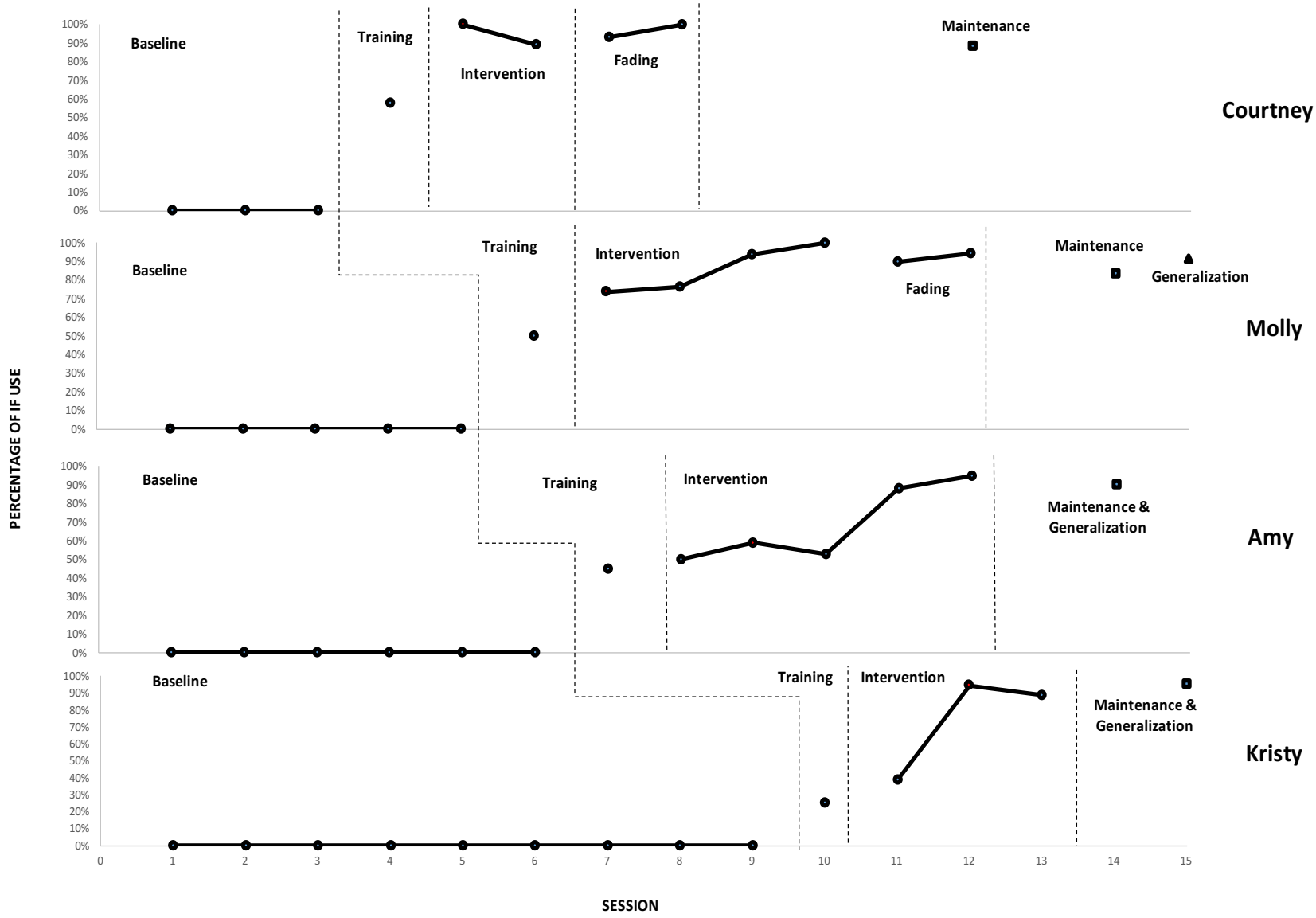

Figure 1. Percent of instructive feedback use across participants

Type of IF Used by Participants

Figure 2 shows the mean number of each type of IF use in each study phase by the participants. None of the participants demonstrated use of IF during baseline. Courtney predominately used expansion IF and limited novel IF after didactic training. She did not use any parallel IF. Once e-mail feedback intervention had started, Courtney demonstrated uses of all three types of IF, where she used both expansion and novel IF equally. The amount of parallel IF used during intervention phase was low. When fading started Courtney demonstrated a stronger preference for novel IF, followed by expansion, and again her use of parallel IF was low. At one-month follow-up, her use of parallel IF remained relatively low and she predominantly used expansion IF while maintaining a moderate demonstration of novel IF.

Throughout the study, Molly showed an interesting pattern of her IF choice during instruction. Following didactic training, she did not use any novel IF but used expansion IF the most, followed by parallel IF. After receiving e-mail feedback, Molly demonstrated uses of all three types of IF. During intervention phase, the amount of novel IF was used more than double the use of expansion and novel IF. When fading phase started, she continued to demonstrate a preference for novel IF over the other two types; and particularly, she did not use any more parallel IF after intervention had ended. Her use of expansion IF after intervention also remained low for both fading and follow-up.

Amy showed a clear preference for expansion IF throughout all study phases after baseline. Following didactic training, she used expansion IF three times more than parallel IF and did not use any novel IF. In subsequent e-mail feedback sessions, the experimenter praised Amy's high quality of expansion IF but also suggested she diversify her use of IF as part of corrective feedback. As a result, she increased the use of both parallel and novel IF during

intervention, but expansion IF remained the highest among all three types of IF. At follow-up probe, the preference of expansion IF was more pronounced; and similar to her data after didactic training, she predominantly used expansion IF but only showed limited use of parallel IF and no use of novel IF.

Kristy did not use any novel IF but demonstrated equal use of both expansion and parallel IF after didactic training. During intervention, Kristy was given feedback to diversify her use of all three types of IF and as a result, she demonstrated a balanced use of IF in her instruction. In one-month follow-up, Kristy expressed that she did not find it appropriate or meaningful to use IF with her new child participant given his level of language comprehension; and she specifically informed the experimenter that she would not be using novel IF in her follow-up instructional session.

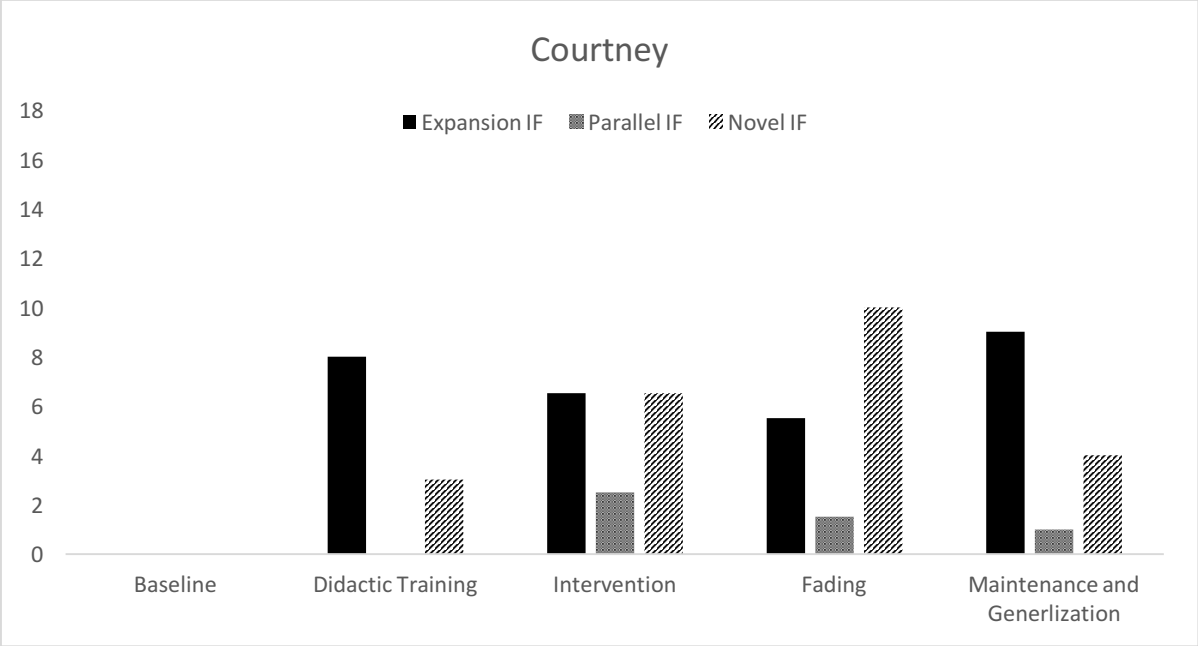

Figure 2. Mean number of IF for Courtney

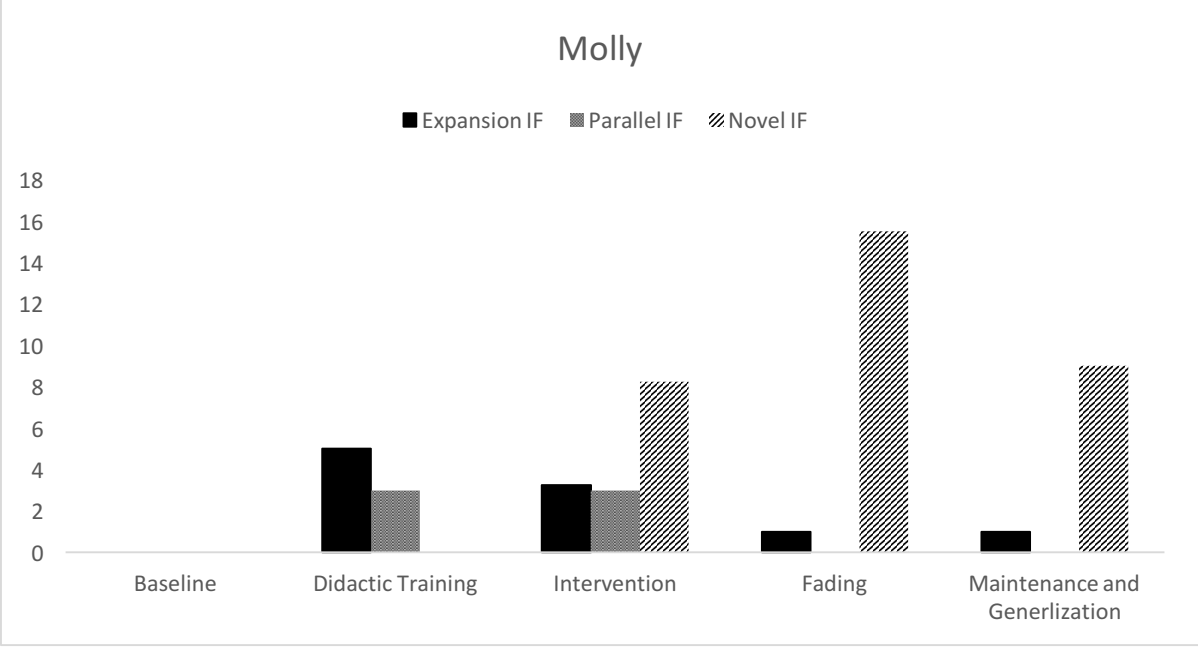

Figure 3. Mean number of IF for Molly

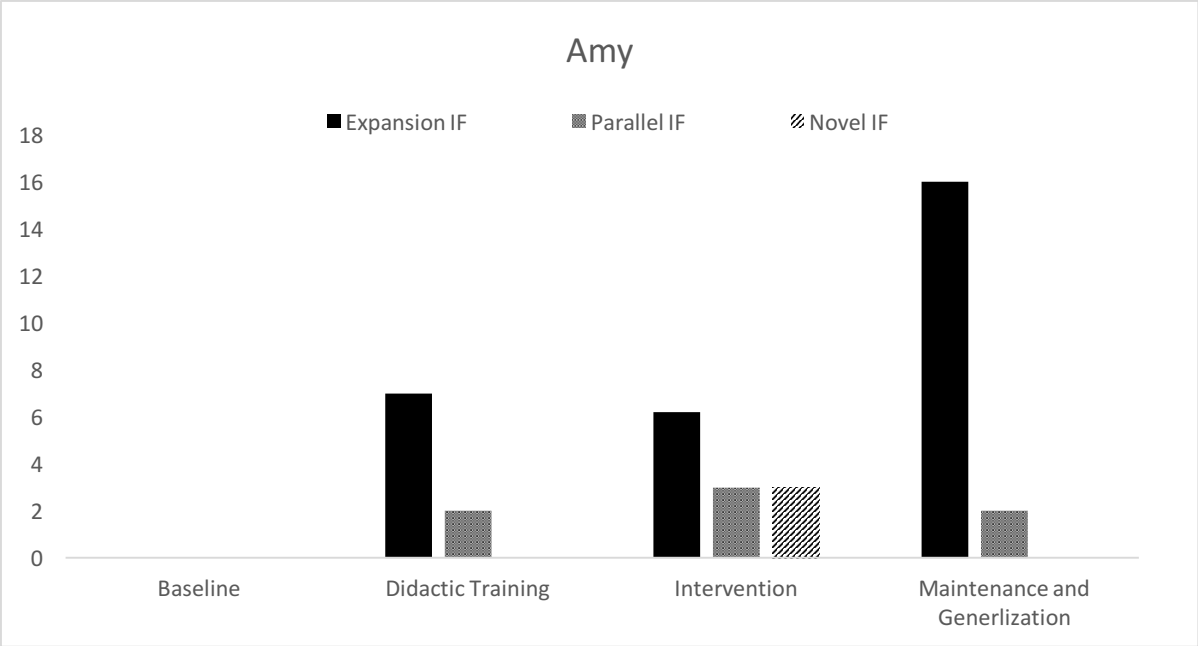

Figure 4. Mean number of IF for Amy

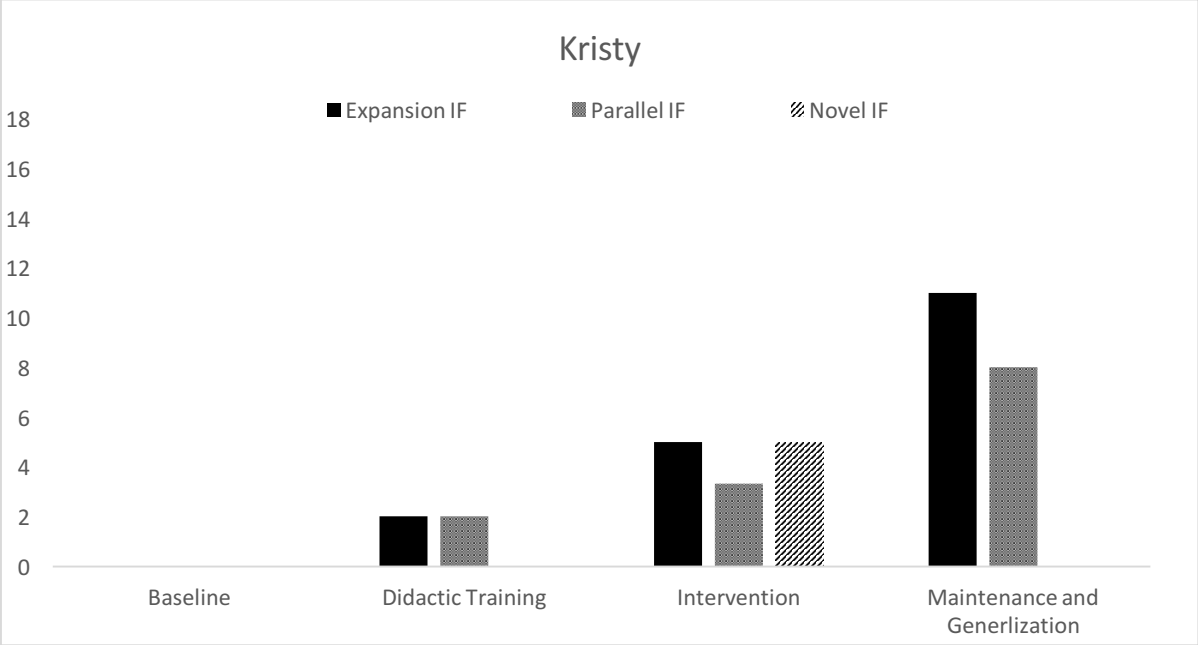

Figure 5. Mean number of IF for Kristy

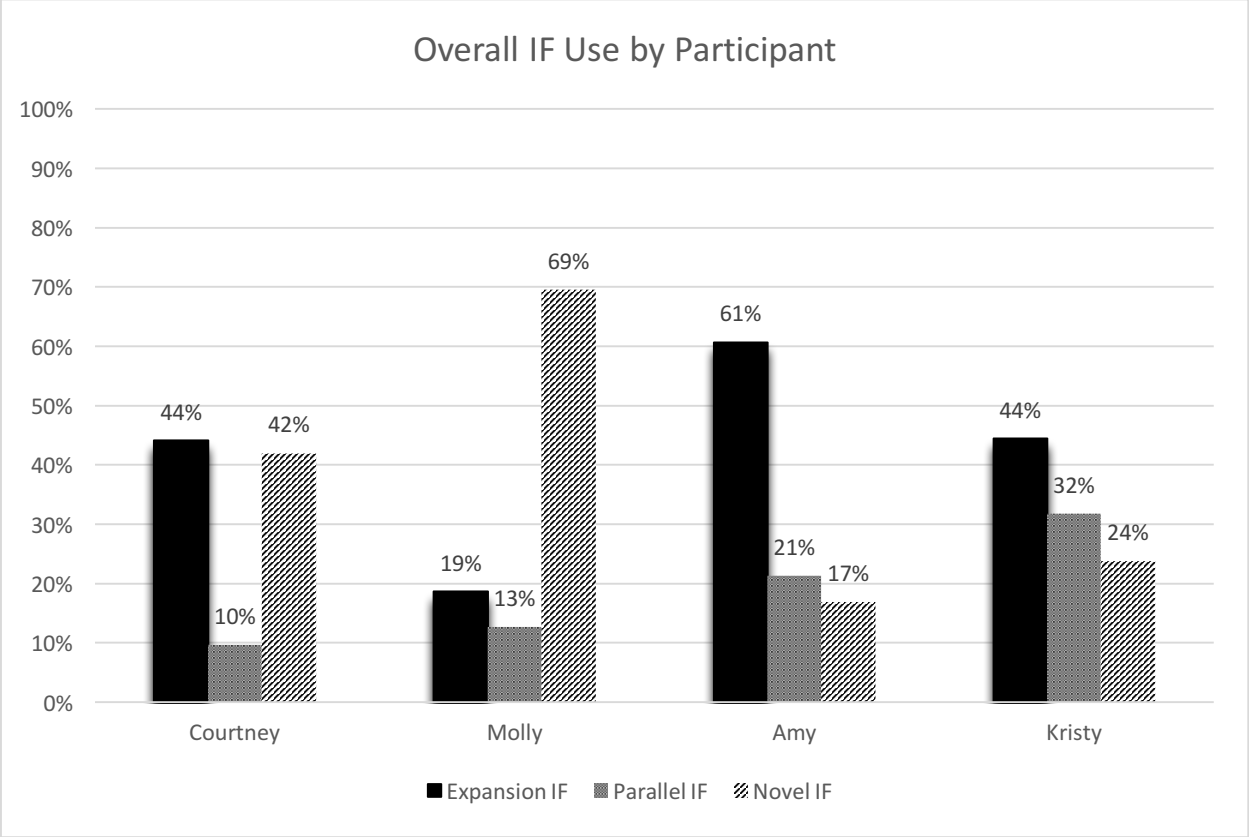

Figure 6. Overall IF use by participant

Figure 6 shows the overall percentage of type of IF use by each participant, which corroborates the participant's preferences for IF. Both Molly and Amy showed a strong preference for a specific type of IF. For Molly, 69% of her use of IF was novel IF; whereas for Amy 61% was expansion IF. Kristy, on the other hand, did not have such a strong preference and she used expansion at 44% and parallel IF at 32% of her instruction. The overall use of novel IF was at 24%. Courtney had the lowest overall use of parallel IF at only 10%. However, her overall use of expansion and novel IF was similar, at 44% and 42% respectively.

Social Validity

All participants rated the didactic training very or extremely useful, and e-mail feedback extremely useful in improving their use of instructive feedback. Two participants indicated that

the frequency of feedback at two times per week was appropriate, whereas the other two participants, Kristy and Courtney, thought they could use a little more feedback. All participants revealed that they had occasionally received feedback delivered via e-mail in the past from their supervisors. They found e-mail to be an acceptable platform for delivery of feedback and would like to continue to receive e-mail feedback in the future as part of their supervision.

The participants indicated that it was slightly or somewhat easy for them to generate IF statements on their own and they observed immediate benefits of IF with their child. For example, Amy commented "[m]y client makes parallel matches or expansions with features and functions of different objects in a more generalized way." Courtney also mentioned "[m]y client used the information I provided in feedback later in different sessions." All of them intended to continue using IF with their current child participants and other children in the future. When asked if a particular type of IF was easy or difficult to use, Amy and Molly commented that novel was particularly difficult to learn and use at first because it was less natural. Kristy expressed strong opinion about using novel IF as she believed with some children, novel IF modelled how to be off track or off topic.

Participants indicated that it took between 20 to 30 minutes to review the e-mail feedback, including the time to access to the e-mail account, read the e-mail, and respond to the experimenter. The time to upload the videos for each feedback session varied across participants. The shortest time was less than 10 minutes whereas the longest time took up to 30 minutes. The amount of time to upload a video correlated to the length of the instructional video. In general, the longer the video, the bigger the digital file and the more time it took to upload it. None of the instructional videos exceeded 20 minutes.

Discussion

This study demonstrated that e-mail feedback is effective in increasing the quality of instruction provided by behavior therapists to children with autism spectrum disorder (ASD) in home and clinical settings. It extended to the current knowledge base of e-mail feedback as a training tool by demonstrating the sustaining changes and generalized teaching behaviors made by the therapist. The current study examined the effects of a professional development package, including e-mail feedback, on behavior therapist's use of new instructional strategies when working with children with ASD. The results indicated that a didactic training, designed to introduce the concepts of instructive feedback (IF) and provide practice opportunities, was effective in increasing the use of IF by the behavior therapists. However, only when performance feedback delivered via electronic mail was provided did the behavior therapist demonstrate proficiency of IF. Although all four therapists increased their use of IF after didactic training, they were still limited in the frequency and range of IF that they used. All of the behavior therapists demonstrated IF in fewer than 60% of the instructional trials, and only used two of three types of IF after didactic training. It is unlikely that they would have reached 80% or better proficiency without e-mail feedback. These results are consistent with previous research documenting rapid skill acquisition and improved proficiency when performance feedback was provided (Downs, Downs, & Rau, 2007).

The present study provided new evidence that when given training and feedback, behavior therapists could be effectively trained to not only implement IF but also to generate unique IF stimuli different from the ones in training and tailored to the child's learning needs. To the author's knowledge, this is the first study to train behavior therapists to incorporate IF in instruction for children with ASD. In many previous studies, either the experimenter who held a

graduate degree (Wolery, Schuster, & Collins, 2000) or the child's teacher who had multiple years of teaching experience (Griffen, Schuster, & Morse, 1998; Holcombe, Wolery, Werts & Hrenkevich, 1993) implemented IF and pre-selected the stimuli. This study supported that implementation of IF could easily be performed by paraprofessionals who did not have such credential. The comment made by the therapists also indicated that generating IF stimuli was generally easy. One potential explanation for the therapist's ability to generate IF stimuli uniquely for each child and without the experimenter's prescription is that, a generalization strategy was programmed in the didactic training session. For each type of IF taught, the experimenter demonstrated application of IF for at least three examples of language programs. During role-play scenarios, the therapists were asked to demonstrate IF across two programs different from those modeled by the experimenter. Through these activities, the experimenter actively programmed teaching sufficient examples (Stokes & Baer, 1977) in the training, which is believed to have facilitated the therapist's generalized use of IF across different language programs when they conducted teaching sessions with their individual child. Very few studies documented generalization strategies in staff training protocols (Bolton & Mayer, 2008). In this present study, the active programming of generalization strategy in training could essentially be an effective and efficient way to increase skill proficiency in staff and yield desirable implementation outcome.

An unexpected finding from this study indicated an interesting trend of therapist's preference for IF use. None of the behavior therapists implemented all three types of IF without e-mail feedback; and expansion IF was the only type that was consistently implemented by all behavior therapists following a didactic training session. The therapists commented that expansion IF was easy and natural to use because they were simply expanding on the child's

responses with a related comment, whereas in using novel and parallel, more time and effort was needed to prepare the IF stimuli prior to the start of instruction. This finding suggested that expansion IF was a more straightforward type of IF than novel and parallel. As the study progressed and the behavior therapists continued to receive feedback, all therapists demonstrated equal use of IF but gradually showed a preference for one type of IF. Both Courtney and Molly showed a strong preference for novel IF during fading. Molly's preference remained the same in maintenance and generalization phase, but Courtney's preference switched back to expansion in maintenance and generalization phase. Although fading phase was not introduced to Amy and Kristy, in maintenance and generalization phase, Amy showed a strong preference for expansion IF whereas Kristy on the other hand showed a strong preference for not using novel IF. While one may argue that the behavior therapists did not maintain nor generalize their use of all three IF types once feedback was ceased, the therapists explained that the differential use of IF was a result of finding a particular type of IF more useful and valid for the specific child they were teaching. Kristy also explicitly stated in her e-mail response before submitting the video for generalization probe that she would not be using novel IF with her child because she found it inappropriate and the language confusing to the child's level of language comprehension. These findings are encouraging that once the behavior therapists demonstrated teaching proficiency, they are capable of making instructional decisions and individualizing instruction without explicit guidance from an experienced supervisor. However, IF is a rather discrete teaching behavior and these therapists had experience teaching children with ASD, interpretation of this finding for other complex teaching techniques should be made with caution.

Most previous studies investigating the effectiveness of e-mail feedback reported no or limited data on maintenance and generalization of instructor performance (Allday et. al., 2012;

Artman-Meeker & Hemmeter, 2012; Barton, Pribble, & Chen, 2013; Barton & Wolery, 2007; Hemmeter, Snyder, Kinder, & Artman, 2011). In order to evaluate the effectiveness of any training program like performance feedback, examination of maintenance and generalization effect across time, children, and tasks is important (Koegel, Glahn, & Nieminen, 1978). The results of the present study indicated that behavior therapists continued to maintain proficient use of IF at levels similar to intervention levels for four weeks following cessation of exposure to feedback. In addition, they demonstrated high levels of competence in using IF across children as well as various language programs. Taken together, results from the present study provide solid evidence that a one-hour didactic training session combined with follow-up e-mail feedback sessions is effective in promoting the use of IF by behavior therapists across various learners and instructional programs over time.

The findings of this study contribute to the existing literature in several important ways. First, it supports the professional development (PD) literature that performance feedback is an essential and effective professional development component in increasing implementation of a new teaching practice (e.g., Casey & William, 2011; McKenney & Bristol, 2015). When used in combination of other PD components such as training, performance feedback produced sustaining implementation outcomes (Noell et. al., 2005) and prevented a decline in implementation (Solomon, Klein, & Politylo, 2012). Second, previous studies on application of IF predominantly studied the effect of expansion IF (Nottingham, Vladescu, & Kodak, 2015). Although child's learning efficiency of IF stimuli was not measured in the present study, anecdotal evidence suggested that all three types of IF facilitated quick acquisition of the IF stimuli. Future studies should expand investigation of all three types of IF and their effect on the child's overall rate of learning.

Third, while there is a large body of research conducted in an educational setting with paraprofessionals and special education teachers working with children with ASD (Bolton & Mayer, 2008; Gilligan, Luiselli, & Pace, 2007; Hall, Grundon, Romero, 2010; McKenney & Bristol, 2014), the literature is sparse for paraprofessionals who implement Applied Behavior Analysis-based programs in non-school settings. This study, therefore, adds to the emerging professional development literature (Ryan & Hemmes, 2005) for the growing population of paraprofessionals who provide behavioral health treatments for children with ASD in a clinical and non-educational setting.

Fourth, only limited studies have attempted to examine the effectiveness of using electronic mail to deliver performance feedback (Artman-Meeker & Hemmeter, 2012; Barton, Fuller, & Schnitz, 2015; Barton & Wolery, 2007; Barton, Pribble, & Chen, 2013; Hemmeter, Snyder, Kinder, & Artman, 2011; Oborn & Johnson, 2015). The current study provides additional and robust evidence of changing behavior therapists' teaching practices through the use of e-mail feedback. E-mail is now ubiquitous; it is convenient and delivers messages immediately, allowing the sender to compose and the recipient to read the message at any time. This is beneficial for supervisors who are providing distant supervision or are limited by their availability to meet face-to-face with the supervisees. E-mail also provides a written record of the message. Supervisees can easily access to the message and be reminded of the pertinent information when needed.

Developments in technologies has broaden the scope of coaching practice. The use of video-based observation and electronic mail in this present study exemplifies how technology has supported cost-effective, time efficient, and individualized training and support for staff. Advancement of technology is underway everyday. Researchers should continue to substantiate

the literature base on how technology can improve our practice. For example, texting is similar to e-mail which allows instant delivery of feedback. It is immediate and ubiquitous. Future studies should examine other electronic communication methods to deliver performance feedback.

Limitations

The behavior therapists recruited for this study represented a group of individuals with unique traits, and generalizability of the findings may be limited. The therapists were relatively experienced with prior training in Applied Behavior Analysis (ABA) and working experience with children with ASD. They were also required to demonstrate competency in discrete trial teaching (DTT), which was a foundation skill for application of IF. Correct implementation of IF depends upon the correct implementation of DTT. Therefore, generalizability of the findings from this study should be made with caution for therapists who had little prior experience in ABA or had not successfully mastered the application of DTT. In addition, participation in this study required the behavior therapists to have some basic skills using technology, such as knowing how to upload videos online, set up user account, and check e-mails. Although this kind of technology is more widely used nowadays, researchers should be aware of potential challenges when recruiting participants who are not familiar with these online tools in future studies.

This study may also be limited by selection bias. The behavior therapists volunteered to participate in this study. These were individuals who showed motivation to improve their current teaching practice. They also rated instructive feedback as a highly acceptable practice and beneficial practice for the child participants. Joyce and Showers (2002) suggested that when trainees found the content of training useful and beneficial to their learners, they were more

likely to apply the teaching practice. In our case, it is likely that our findings were enhanced due to the interest of the behavior therapists in participating in this study.

In addition to receiving performance feedback from the experimenter in this study, the behavior therapists continued to receive supervision on an average of twice a month from their regular supervisors at the participating behavioral health agency. During these supervisory sessions, the behavior therapists might receive feedback regarding their management of the child's behaviors or teaching strategies. The therapists, however, reported no IF-related feedback received from their supervisors. This present study focuses on providing feedback only on a target practice and does not recommend performance feedback delivered via e-mail to replace the traditional face-to-face supervision approach.

The current study is limited by the lack of data on child outcomes. The positive effects of IF on child behavior have been well documented. Since instructive feedback (IF) is an evidence-based practice and has been researched over the past 20 years (e.g., Anthony, Wolery, Wers, Caldwell, & Snyder, 1996; Griffen, Schuster, & Morse, 1998; Wolery et al., 1991) and more recently with children with ASD (e.g., Loughrey, Betz, Majdalany, & Nicholson, 2014; Reichow & Wolery, 2011; Vladescu & Kodak, 2013), the effect of the behavior therapist's improved practice on the child's learning was not measured in this study. However, the therapists reported that immediate benefits of IF were observed in the children. The goal of this study was to determine the efficacy of e-mail feedback. Future research should examine training and e-mail feedback in relation to behavior therapist's teaching practice and subsequent changes in child's learning.

Implications for research

This study offers several implications for future research. First, professional development using a combination of training and performance feedback is an effective method in increasing the use of evidence-based practices in an applied setting. The format of didactic training, which includes components of description of the target skill i.e. instructive feedback, modeling, rehearsal, and feedback, has shown to be effective in increasing knowledge and use of IF in behavior therapist's instruction for children with ASD. This finding is consistent with the current literature on the evidence-based practice of behavior skill training (BST; Nigro-Bruzzi & Sturmey, 2010; Ward-Horner & Sturmey, 2012), and suggests that this is a valid staff training method. Although there was enough evidence to demonstrate a functional relation between training and IF use, proficiency was not reached until commencement of e-mail feedback. This further suggests that training alone is not sufficient (van Oorsouw, Embregts, Bosman, & Jahoda, 2009) and follow-up coaching such as the use of performance feedback is recommended to provide additional implementation support (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Past studies have used performance feedback as a stand-alone practice and demonstrated it was effective in improving teaching practice. This present study included both training and performance feedback in a PD package. Future research should investigate whether performance feedback as a stand-alone practice would produce different outcomes when compared to performance feedback used in a training package.

Second, while this study provided strong evidence of the effectiveness of performance feedback delivered via e-mail in training and improving application of a new skill by behavior therapists, instructive feedback is a rather discrete teaching behavior, and it is unknown whether the effect will extend to other behaviors that are more extensive or complex. Future research

should examine the effectiveness of performance feedback delivered via e-mail, and assess its maintenance and generalization effects on multiple teaching behaviors or behaviors that have multiple components such as discrete trial teaching.

Third, the types of feedback provided to the behavior therapists in the present study included data-based feedback, supportive feedback, and corrective feedback. It is unknown to us whether the effectiveness of feedback was a result from a single type of feedback or a combination. In addition, behavior therapists received feedback via e-mail twice a week in this study. However, results from social validity survey revealed that some therapists preferred more frequent feedback while some found the current dosage appropriate. Research should investigate the optimum frequency, intensity, and duration of feedback, and how it associates with characteristics of behavior therapists.

Fourth, the use of video review and electronic mail is an effective and efficient method to deliver performance feedback. Live observation and coaching sessions often require both supervisor and supervisee in the same setting at the same time, thus, posing challenges in scheduling and time wasted in traveling for individuals who are in remote regions. In this study, the experimenter took between 10 to 20 minutes to view each video of teaching session, and another 15 to 30 minutes to compose an e-mail to deliver feedback to the behavior therapists. The total time spent on providing feedback to each behavior therapist is considerably less than the time to provide face-to-face feedback. Future studies could potentially compare the relative effectiveness and efficiency between feedback delivered electronically and in-person.

Last, establishing a relationship between the individuals giving and receiving feedback is critical in a coaching process (Barton, Pribble, & Chen 2013; Herll & O'Drobinak, 2004). In this present study, the experimenter and participants had two separate occasions for face-to-face

meetings. In the orientation meeting, the experimenter and participants had an opportunity to get to know each other through sharing of work experiences as well as educational and training backgrounds. Once the study commenced, the experimenter also conducted a live-training and worked collaboratively with the participants to identify the goals of the study (i.e. improve the use of instructive feedback). Although the relationship between the experimenter and participants was brief, it appeared to have a positive influence on the participants' willingness to accept feedback from the experimenter, as indicated by the desirable changes of their teaching practice over the course of this study. Future research should investigate whether such live interaction is necessary and if other forms of distant interaction such as video-conferencing could replace live interactions and yield the same outcomes.

Recommendations for practice

The service-need gap for behavioral health treatment for children with ASD warrants the search for more evidence-based training and coaching practices that are both effective and efficient. The results of this study have several implications for practice. This present study establishes not only the effectiveness but also the efficiency of using e-mail to deliver performance feedback. Behavioral health agencies sometimes face challenges in meeting staff training and supervision needs due to constraints imposed by funding sources (Leaf, Taubman, McEachin. Leaf. & Tsuji, 2011). Supervising behavior analysts may be limited by the amount of face-to-face supervision sessions they can conduct each month. While we do not recommend e-mail feedback to replace traditional face-to-face supervision, e-mail offers a viable alternative to supplement existing supervision practice. Behavior analysts can introduce e-mail feedback in between supervisory sessions and target discrete teaching behaviors. The use of videotaped sessions is also an unobtrusive strategy to minimize reactivity from both behavior therapist and

child. E-mail feedback based on video-based observations will allow the supervisor to provide contextually relevant feedback to therapist's teaching behaviors while avoiding interruption or reduction of session time during delivery of live feedback. The e-mail can also function as a permanent product, allowing the therapists to review the feedback as needed, as well as the supervisor and behavioral health agency to retrieve it for ongoing performance evaluation. Furthermore, using e-mail feedback as supplementary supervision means an increase in accessibility to support, which is a challenge many behavior therapists face. The increase of supervision can potentially reduce the issues of attrition and burnout experienced by behavior therapists (Gibson, Grey, & Hastings, 2009).

This present study exemplifies how technology can increase accessibility to high quality professional development opportunities for behavior therapists who are often faced with the obstacles of working in an isolated environment. While technology has made professional development opportunities convenient and it is exciting to experience the positive impacts technology brings to our practice, such convenience comes with substantial risks in regard to confidentiality and privacy (Cavalari, Gillis, Kruser, & Romanczyk, 2015). Behavioral health agencies should develop a set of guidelines and policy and procedures to safeguard client confidentiality and privacy and ensure staff are educated in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA), and other relevant and applicable regulatory parameters. Maintaining treatment integrity through high quality professional development is important, but it should not be done with the cost of compromising the integrity of client confidentiality and privacy. Behavioral health agencies and behavior analysts are encouraged to review Cavalari, Grillis, Kruser, and Romanczyk's (2015) article regarding digital communication and records in service provision and supervision.

When considering the use of technology such as e-mail and video recordings, behavioral health agencies should also evaluate the infrastructure established within the agency. In the present study, behavior therapists were supplied with an iPad which had the capability of videotaping therapy sessions and directly uploading the videos to a site for the experimenter to download and review the footage. The agency also offered free access to the internet allowing the behavior therapists to upload the videos and check their emails if they did not have internet at their own home. Agencies who plan on adopting technology in their practice should consider the cost associated with purchasing computer equipment as well as other fees for building an infrastructure for transmitting and storing digital records of client information.

Conclusion

There is an increasing demand for qualified and trained paraprofessionals to provide behavioral health services to children with Autism Spectrum Disorder (ASD). These individuals will require ongoing supervision to support their implementation of high quality intervention. The present study demonstrated the effectiveness of delivering performance feedback via e-mail to improve behavior therapists' use of an evidence-based practice (i.e. instructive feedback). The use of e-mail was efficient and offered a viable alternative for supervising behavior therapists who served families in remote areas. This study also expanded the limited professional development literature for paraprofessionals who provide behavioral health treatments for children with ASD. As more insurance and government agencies are paying for applied behavior analysis-based treatments, there will continue to be a push for standardizing and maintaining the quality of these paraprofessionals. Future research should continue to focus on examining training and coaching practices to support these paraprofessionals.

Appendix A: Competency Checklist

Subject: _____

Date: _____

Competency Checklist																				
Skills	**Trials**																			
Presentation of Instruction	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Secure child's attention																				
2. Present correct instruction																				
3. Present instruction only once																				
Delivery of Prompts	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4. Use effective prompt																				
Manage Child's Response	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5. Correct response (including prompted one) - deliver reinforcement																				
6. Incorrect response - deliver error correction procedure																				
Correct Trial (5/5)?																				

Appendix B: Sample E-mail Feedback

Hi Molly,

That was a great teaching session today! K was responding really well to your instruction. He seems to have gotten used to the camera already.

I noticed you have used more instructive feedback in your session with K. Out of the 20-minute instruction, you gave instructive feedback for a total of 8 times. That's a big jump from our last video. Way to go, Molly! When K labeled the picture zebra, you commented that zebra has black and white stripes. That was a great expansion statement of instructive feedback. I also love when you added that comment "you can also drink juice and milk from a cup" after K said "drink water from a cup." That's another great way of expanding his statement and introducing expansion IF.

Like our previous e-mails, I am going to give you some more feedback about other ways to increase your use of instructive feedback. We want you to get the most out of this study.

One thing I noticed from your session today is that most of your IF statements are expansion, but I think there were a few opportunities where you could use a novel or parallel IF statement. For example, when you asked where you put the baby bear and K responded "the bear is in the box" you gave great behavior specific statement "that's right, the bear is in the box." After your praise statement, you could also put the mama bear in a bigger box and comment, "*the bear is in the box*!" This would be a way to deliver parallel IF statement. To use a novel IF statement, when you were reading the safari book with K, he responded to you saying "the leopard is running" you could then comment on other things happening in the book such as "oh, there is a Jeep behind the bushes!" or "the boy looks excited when he sees the giraffe."

Remember in our training, I gave you a handout with examples of novel and parallel IF statements? Please review them again. I think they will give you a better sense of how you could generate more parallel and novel IF statements.

I have you on my schedule that your next scheduled videotaped session is with Alexis this Thursday. Can you please confirm? If this time is correct, I will have your e-mail feedback within 24 hours upon your video submission.

Please write me back to let me know that you have reviewed the handout and the video submission date is correct. If you expect any delay or a change in schedule, just let me know.

I am looking forward to watching your next video. J is such a fun kid to work with.

Have a great evening!

Ivy

Appendix C: Fidelity Check for Didactic Training Session

Fidelity Check - Training Session	
Procedures	✓ or ✗
1. Outline goal for training session	
2. Define instructive feedback	
3. Define the 3 categories of IF	
4. Identify IF benefits	
5. Provide examples and non-examples of IF	
6. Present scenarios for participants to generate IF	
7. Role-play the use of IF in instruction of receptive and expressive tasks	
8. Discuss procedures of receiving e-mail feedback	
9. Confirm next video submission date	
10. Allow participants to ask questions about the study	
TI % = # of steps completed / total # of steps (i.e. 11) X 100%	%

Appendix D: Fidelity Check for E-mail Feedback

Fidelity Check - E-mail Feedback	
Procedures	✓ or ✗
1. Opening positive statement e.g., what a great session you had today	
2. Supportive feedback e.g., I noticed you used 8 IF statements today	
3. Correct feedback e.g., you could have inserted an IF statement such as "zebra also has black and white stripes"	
4a. Planned action e.g., review the training materials and fill out the worksheet by coming up with 2 examples	
4b. Planned action re: video submission	
5. Closing statements e.g., I look forward to your next video	
TI % = # of components completed / total # of components (i.e. 6) X 100%	%

Appendix E: Social Validity Questionnaire

Questionnaire – E-mail Feedback Study

Thank you again for participating in this study, "Effects of Training and E-mail Feedback for Behavior Therapists' Use of Instructive Feedback" led by Ivy Chung. This questionnaire is intended to gather information about your study experience. If you have a moment, please fill out this questionnaire. If you need clarification on any of the questions, please feel free to contact via e-mail. Thank you for taking the time to complete this.

Question 1:

Your Subject Number: (e.g., 001, 002):

Question 2:

How useful were the initial 60-minue training and e-mail feedback in improving the use of instructive feedback with your student(s)?

	Not useful at all	Slightly useful	Somewhat useful	Very useful	Extremely useful
Initial 60-minute training	☐	☐	☐	☐	☐
E-mail feedback	☐	☐	☐	☐	☐

Question 3:

How did you like the frequency of receiving e-mail feedback?

☐ Prefer a lot less feedback

☐ Prefer a little less feedback

☐ About right

☐ Prefer a little more feedback

☐ Prefer a lot more feedback

Question 4:

Would you like to continue to receive e-mail feedback in the future as part of feedback in your supervision?

☐ Yes ☐ No

Question 5:

Have you had any supervisor who has provided you feedback via e-mail regarding your teaching practice (not necessarily on the use of instructive feedback)?

☐ Yes, my supervisor used e-mail feedback frequently

☐ Yes, my supervisor used e-mail feedback occasionally

☐ No, I have never received feedback about my teaching via e-mail from my supervisor

Question 6:

How easy was it for you to generate instructive feedback statements?

☐ Not easy at all

☐ Slightly easy

☐ Somewhat easy

☐ Very easy

☐ Extremely easy

Question 7:

Did you find a particular type of IF easy or difficult to use? Which one and why?

Question 8:

Did you observe any benefits of IF with your student(s)? If so, please describe.

Question 9:

On average, how much time did it take you to review the e-mail feedback, including the time to access your e-mail account, read the e-mail, and respond to the research?

☐ Less than 10 minutes

☐ Between 10-20 minutes

☐ Between 20-30 minutes

☐ Between 30-40 minutes

☐ More than 40 minutes

Question 10:

On average, how much time did it take you to upload the videos for each feedback session?

☐ Less than 10 minutes

☐ Between 10-20 minutes

☐ Between 20-30 minutes

☐ Between 30-40 minutes

☐ More than 40 minutes

Question 11:

Do you anticipate continuing using instructive feedback with your students after this study?

☐ Yes

☐ No

Question 12:

Are you using or do you plan to use instructive feedback with other students not in this study?

☐ Yes

☐ No

Question 13:

Do you have any other comments about this study?

This is the end of the questionnaire. Thank you.

Appendix F: Coding Instructions

E-MAIL FEEDBACK – CODING INSTRUCTIONS

To Access Videos:

1. Go to this link: https://catalyst.uw.edu/collectit/dropbox/ivycms/35694
2. Log in using your Google mail log in information

Scoring Video:

Each video is approximately 20 minutes long capturing the subject providing 1:1 instruction to a young child. Code the first 20 instructional trials per video. Pause the video and code after completion of each instructional trial. ****Only a completed instructional trial should be coded.**

A complete instructional trial includes at least 3 components:

1) *Subject's delivery of instruction*:
   - The type of instruction may vary depending on the child's objective. It typically is in the form of a question or a direction.
   - Examples: "what color is your shirt?" "Give me the cup" "place the car under the table"
   - Non-examples (statement that does not require a response from the child): "I like your shirt." "Oops, I drop my pen."

2) *A child's response:*
   - After each delivery of instruction, the subject will pause and provide an opportunity for the child to respond. However, that does not necessarily mean the child *will* respond or respond correctly. Only a trial with the child's response is considered a data trial for.
   - *Prompting (this component is optional): On some occasions, the subject may deliver a prompt at the same time or after delivery of instruction. A prompt is a form of assistance the subject offers to the child in order to increase the likelihood of a correct response from the child.

3) *Subject's delivery of consequence*
   - After the child has responded (whether it is prompted, correct, or incorrect), the subject will deliver feedback to the child.
     - If the child responds correctly (with or without prompt), the subject will deliver reinforcement: verbal praise (e.g., "You are right, your shirt is BLUE"), edible (e.g., candy, cookies), break (i.e. pause from instructional activity), access to preferred activity (e.g., trampoline, listen to music).
     - If the child responds incorrectly, the subject will correct the child by demonstrating the correct response.

To code each completed instructional trial, use the data sheet provided.

1. Fill out the subject name (pseudonym only), date of video coded, and the video number

2. Record only the first 20 completed instructional trials from the video
3. For each trial, record the following:
    a. Child Response: indicate whether the child responds correctly to the instruction
    - (+) indicates the child responds correctly without the subject's prompt
    - (P) indicates the child responds correctly with the subject's prompt
    - (-) indicates the child responds incorrectly
    - If the child self-corrects, count it as an incorrect (-) trial
    b. If the response is either (+) or (P) for the trial, record whether the subject provides an IF statement (check the box under No/Yes); If an IF stimulus is presented, indicate how the IF stimuli are related to the
        i. Expansion: Expansion IF stimuli are conceptually related to the primary target or from the same curriculum content area. Primary targets are targets that receive direct training and require a response from the child)

Instruction/ Primary target	Child's Response	Consequence	Expansion IF	Non-Examples
What is this (and show a picture of a hat)	Hat	Good job, this is a hat	You wear a hat on your head OR Show a picture of a shirt and label it	*1. What do you do with a hat?
Read this word	Cat	That's right, it says cat	And it's spelled C-A-T OR A cat is an animal	*2. I have 2 cats at home.
What is a bed for?	A bed is for sleeping	You got it, you sleep on a bed.	And a bed is furniture	*3. What things are on your bed?
Show me the grocery store	Child points to the grocery store picture	Awesome, you showed me the grocery store	We can buy fruits and snacks in a grocery store OR QFC is a grocery store	*4. Show another picture of a grocery store

*Although the questions in *1 & *3 intend to expand on the concepts of the primary targets, IF stimuli should not require the child to respond/
*2 is not considered an expansion of IF because the information is not instructive i.e. does not teach new information to the child
*4 is a form of parallel IF, not expansion IF

ii. Parallel: In parallel IF, both primary and parallel IF targets have different antecedent stimuli but the same learner response.

Instruction/ Primary target	Child's Response	Consequence	Parallel IF	Non-Examples
What is this (and show a picture of a	Hat	Good job, this is a hat	Show a different picture of a hat and say	*5. A hat can

hat)			"this is also a hat"	protect you from the sun on a sunny day
Show a dime and ask how much is a dime worth?	10 cents	That's right, a dime is worth 10 cents	Show the number 10¢	*6. Show a quarter and say it's worth 25 cents
Show the word "Stop" and ask the child to read	Stop	Great, it reads STOP	Show a gesture of "stop"	*7. Do you know what a red light means?
Show a picture of a park and ask where is this place?	A park	Yes, it is a park!	Show the word "park" and say "this reads park"	*8. Who do you go to a park with?

*5 & 6 are considered expansion IF, not parallel IF
*7 is a non-example of parallel because it is in a question form. If the question is changed to a statement "a red light means STOP" then it will be considered a parallel IF stimulus.
*8 is a non-example of parallel IF because it requires a response from the child

iii. Novel: Novel IF stimuli are neither conceptually related to the primary target nor from the same curriculum content area as the primary target.

Instruction/ Primary target	Child's Response	Consequence	Novel IF	Non-Examples
What are these (and show a picture of hats)	Hats	Good job, these are hats	Count "1, 2, 3, 4, and 5 hats"	*9. How many hats do you have?
Show me blue	Point to blue	Excellent, you showed me blue	This is a circle	*10. Blue and yellow makes green
What does a cow say?	Moo	YEAH, a cow says moo	Show a picture of a girl jumping and say "this girl is jumping"	*11. A cow spells C-O-W
Where do you park a car?	A garage	You got it, you park a car in a garage.	A clock is for telling time.	*12. I parked my car in the garage today.

*IF targets should not require a response, therefore *9 is not an example of IF
*10 is considered an expansion IF not novel IF because the information of "blue and yellow makes green" is conceptually related to the primary target "blue

*11 is considered parallel IF not novel IF because both responses from the primary target and IF target have the same response of "COW"
*12 is not considered parallel IF nor other forms of IF because the information is limited in presenting new information to the learner (i.e. non-instructive)

Appendix G: Dependent Variable – Coding Sheet

Subject: _____ Date: _____ Session #: _____

Trial #	Response		IF		Type			Programs	Other/ Comment
	+ or P	-	No	Yes	Expansion	Parallel	Novel		
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Appendix H: Recruitment Letter to Behavior Therapists

Dear Behavior Therapists,

Let me introduce myself. I am a practicing BCBA and Ph.D. student at the UW Special Education Department. I want to tell you about a research project I have designed to learn about the effectiveness of a training package on improving behavior therapist's teaching practices. Specifically, I am interested in offering a training and e-mail feedback intervention to improve a teaching technique called instructive feedback (IF). I have asked Matt Woodard, who is not affiliated with this research study, to send this letter to all the behavior therapists currently working in Basic Northwest. The purpose of this letter is to explain the study to you and invite you to participate. I won't know who you are, or anything about you, unless you decide to contact me.

Although behavior therapists like you, receive training prior to working with the children, training alone is not sufficient to support accurate implementation of behavioral intervention. Therefore, continuous professional development and feedback is needed to improve the quality of intervention. One promising strategy is the use of performance feedback. Common types of performance feedback such as verbal, written, and graphical often require both the therapist and his/her supervisor to meet at a mutually convenient time and place. Such procedures can be time consuming and physically challenging for therapists who are in a remote area. As technology becomes more accessible and web-based communication becomes a widely used option for daily communication, e-mail feedback is a viable platform for delivery of performance feedback.

If you agree to participate in this study, you will be provided with video equipment and asked to videotape 20 minutes of your instructional session with a client twice a week. You will submit the videos to me for review and later receive feedback via e-mail. All phases of the study will take place at your regular workplace (e.g, client's home, center) during your regular working hours; except during orientation and a training session, these sessions will take place at Basics Northwest office. The total time commitment for this study is expected to be 2 hours per week for at least 12 weeks.

Participation in this study is entirely voluntary. Participation or lack of participation will not affect your employment status at Basic Northwest. A consent form describing the study in more detail is enclosed. If you would like to participate, please fill out the attached form and mail it back to me within 2 weeks. If you choose not to participate in this study, I will not contact you. If you have any questions about this study, please contact me at (425) 802-6655 or by e-mail at ivycms@uw.edu. Please be aware that I cannot ensure the confidentiality of information sent via e-mail.

Thank you very much for your consideration of this study.

Ivy Chung, M.Ed., BCBA
(425) 802 6655
ivycms@uw.edu

Appendix I: Consent Form for Adult Participants

UNIVERSITY OF WASHINGTON
CONSENT FORM
Effects of Training and E-mail Feedback on Behavior Therapists' Use of Instructive Feedback

Researchers: Ivy Man Sum Chung, Graduate Student

Special Education, College of Education

Phone: 425-802-6655 / Email: ivycms@uw.edu

Faculty Advisor: Ilene Schwartz, College of Ed., 206-616-3450

Researchers' statement

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called "informed consent." We will give you a copy of this form for your records.

PURPOSE OF THE STUDY

The current literature strongly supports the effectiveness of performance feedback in improving behavior therapist's teaching practices. As a result, better teaching practices improve student achievement. Traditional types of performance feedback such as verbal or graphical feedback require both supervisor and supervisee to meet face-to-face or be available at the same time to review the feedback. Using electronic communication such as e-mail can be a more convenient way to deliver feedback. In this study, behavior therapists will receive a one-on-one training session and e-mail feedback twice a week regarding their instruction. We want to find out if this training package will increase their presentation of comments after a student's response to instruction. This presentation of comments is a teaching technique called instructive feedback (IF). The benefit of IF is the meaningful saving of time and resources by producing additional learning opportunities in few direct teaching trials. For example, after a child has correctly labeled an octagon, a behavior therapist may say "an octagon has 8 sides." This comment will promote learning of this secondary information in the absence of direct teaching. The benefit of IF is particular valuable for special learners who often require many hours each day of intensive intervention.

STUDY PROCEDURES

This study will take place at your current workplace at Basics Northwest during regular teaching sessions. Once you agree to participate in this study, you will enter a two-phase screening process to determine eligibility. If you are selected for this study, you will receive a 45-minute training in the use of instructive feedback (IF) and be asked to create 20-minute video recordings

of your typical sessions twice a week for up to 16 weeks. You will submit these recordings to a secure, invitation only Collect It Dropbox account provided by the University of Washington Catalyst services. The researcher will view your videos and provide subsequent e-mail feedback about your implementation of IF. A Google e-mail account will be assigned to you specifically for this study.

You will attend an orientation meeting prior to the start of this study. The researcher will provide an overview of the study process and instruction on video equipment use and submission in this meeting. At the conclusion of this study, you will also be asked and given a link to complete an online questionnaire. This questionnaire is anonymous and will ask you to rate the effectiveness of the training and e-mail feedback, as well as your perception on the use of instructive feedback.

Please refer to Table 1. for detailed descriptions of the study phases attached at the end of this consent form.

RISKS, STRESS, OR DISCOMFORT

The videotaping procedure in this study may create discomfort or anxiety. Some people may also experience stress knowing that their work will be evaluated and feedback will be given. However, the duration of the video is fairly brief and occupies less than 20% of the regular therapy session. We also anticipate these risks will fade over the course of the study. If during the course of the study you are feeling distressed, you can withdraw from the study at any time without penalty or effect to your employment at Basics Northwest.

All video recordings are uploaded and stored in a highly secure database on a server administered by the University of Washington Technology and Catalyst programming staff. The server is secured from remote attacks, which include: IP restrictions, high-quality username/password rules, and high-grade encryption for all data transmissions. The programming staff are governed by the Federal, State, and UW computing standards. They have also completed training courses on human subjects and HIPAA.

An e-mail account will be set up for all subjects using Google mail services. You will receive feedback from this account that is separate from your personal e-mail. When setting up the e-mail account, we will only use a pseudonym assigned to you and will not provide your contact information such as phone number or secondary e-mail to Google. All e-mail contents will follow a specific protocol designed to deliver effective feedback as well as minimize unnecessary sharing of identifiable and/or protected health information.

Video recordings and e-mail contents will be kept for the entire duration of the study. The researcher will delete both the Gmail services and Collect It Dropbox account on December 31, 2017. When these accounts are deleted, all video recordings and e-mail messages will be destroyed.

All attempts will be made to ensure information and data are stored securely. Nonetheless, there is a potential for breach of confidentiality when data are inadvertently accessed or seen by someone other than the research team. For electronic data that are deleted, these records are retrievable and constitute records that could be obtained through legally compelled disclosures.

ALTERNATIVES TO TAKING PART IN THIS STUDY

Participation in this study is strictly voluntary. You can refuse to participate or withdraw from it at any time during the course of the study. Once you have withdrawn from the study, you will no longer be required to videotape or submit any videos to the researcher and you will also not receive any further e-mail from the researcher. Decision to withdraw will not affect your employment with Basic NW. All previous video recordings and e-mails will be destroyed on December 31, 2017. You will also receive instruction on how to return the video equipment to the researcher.

BENEFITS OF THE STUDY

Through participating in this study, you will learn about the teaching technique called instructive feedback, and receive performance feedback from the researcher regarding your implementation of this technique. If you successfully complete all phases of the study and the training package (i.e. didactic training and e-mail feedback) is effective, you will improve quality of your instruction, which also results in improved quality of services for your clients.

Studies investigating effectiveness of e-mail feedback as well as improving behavior therapist's use of IF are limited in the current literature. The success of this study will, therefore, add to both literatures. Additionally, traditional method of delivering performance feedback via face-to-face meeting can be time consuming for both the individuals providing and receiving feedback. If feedback delivered via e-mail is shown to be effective in improving teaching practices, it offers an alternative method for supervisors to effectively and efficiently monitor staff's performance. However, it is possible that you will not directly benefit from participation in this research.

OTHER INFORMATION

You may refuse to participate and you are free to withdraw from this study at any time without penalty or loss of benefits to which you are otherwise entitled. If during the course of this study, there is loss or damage of the video equipment, you will NOT be held responsible for the cost of the equipment provided for this research; however, you will immediately notify the researcher so a replacement could be delivered to you as soon as possible to avoid interruption of this study.

For the purpose of this study, a pseudonym will be assigned to each participant and all data sets and other study related documents will only be labeled with pseudonyms. Behavioral coding sheets for scoring use of IF that are marked with pseudonyms will be kept for 7 years after the completion of study. Contact information of the participants including phone numbers and email addresses will be necessary for the investigator to maintain contact with the participants for scheduling purposes. This contact information and links to the participants' identifiers will be kept in a locked file cabinet. This information will be destroyed by December 31, 2017.

Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review of this study takes place, your records may be examined. The reviewers will protect your privacy. The study records will not be used to put you at legal risk of harm.

Printed name of study staff obtaining consentSignature Date

Subject's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact one of the researchers listed on the first page of this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

Printed name of subject Signature of subject Date

* Please also provide your phone number for our study staff to contact you: _____

Table 1. Descriptions of study phases

Screening Phases	Location	What will happen?
Screening Phase 1 - Eligibility	N/A	The researcher will contact you to determine if you are eligible for this study. To be eligible, you must: 1) Hold at least a high school degree 2) Have received 40 hours of ABA training 3) Work at least 4 days per week at Basic Northwest
Screening Phase 2 – Competency Check	Regular workplace	If you are eligible, you will: • Distribute the parent opt-out form to the parent of the child whom you will videotape. • Be assigned a Google e-mail account used only for this study • Videotape 1:1 instruction with 1 client • Upload the video to ShareSpaces using your Google e-mail as log-in The researcher will review and evaluate the quality of the instruction and determine if you meet competency requirement in order to be selected for this study.

Study Phases	Location	What will happen?	Duration/ Frequency
Orientation	Basic Northwest office	The researcher will schedule a meeting to review regulations of the Health Information Portability and Accountability Act (HIPPA) You will also: • Receive video equipment • Receive instructions regarding video equipment use and video submission • Submit three 20-minute videos to ShareSpaces. This will give you to practice using the video equipment before the study begins.	60 minutes
Baseline	Regular workplace	• You will videotape and upload a 20-minute video of your instruction with a client twice a week • The researcher will review the	Submit a 20-min video 2x a week for 3 weeks

		videos and e-mail you feedback after each video • Contents of feedback include: positioning of your video equipment, clarity of images	
Didactic Training	Basic Northwest office	• The researcher will schedule a date to conduct training on the use of instructive feedback (IF). • This training will be scheduled at your convenience	45 minutes
E-mail Feedback Intervention	Regular workplace	• Following didactic training, you will record 20 minutes of your regularly scheduled instructional session with a client and upload to ShareSpaces. • The research will review the video and e-mail you feedback regarding your teaching session. • Content of e-mail feedback is specific to the use of IF in your instructional session	Submit a 20-min video 2x a week for up to 3 weeks (no more than 6 videos)
Fading of E-mail Feedback	Regular workplace	• As soon as you demonstrate the use of IF in 50% or more of your instructional trials, this phase will begin • Similar to E-mail feedback phase, you will submit 2 additional 20-minute videos and receive feedback via e-mail from the researcher. • Contents of feedback are similar to previous phase, except no suggestion or correction on the use of IF will be given	Submit two 20-minute videos
*Booster Training	BASICS Northwest office	• Booster training is offered for any participant who demonstrates the use of IF in less than 50% of instructional trials after 6 e-mail feedback sessions. • Booster training session includes 1) researcher and participant review 2 videotaped	Submit up to three 20-minute videos

		samples together, 2) identify opportunities for IF, and 3) generate examples of IF during practice • Upon completion of booster training, record and submit up to 3 videos	
Maintenance	Regular workplace	• You will videotape and submit one video at 2 weeks and another video at 4 weeks after termination of the fading e-mail feedback phase • The researcher will e-mail you to confirm receipt of the video but no feedback will be given during this phase	Submit 1 video at 2 weeks and another video at 4 weeks after termination of fading e-mail feedback phase
Social Validity Questionnaire	A place at your convenience	You will receive a link to access an online questionnaire at the end of this study. The questionnaire is anonymous and you will be asked to rate the effectiveness of training and feedback, as well as perception on the use of IF.	15 minutes

Appendix J: Invitation Letter to Guardians

Dear Parents/Legal Guardian,

I am a practicing BCBA and Ph.D. student at the UW Special Education Department. I am writing to you because Basics Northwest and your child's behavior technician (BT) have agreed to participate in a research study to improve the instructional skills of BTs. Participation in the study will require videotaping your child's regularly scheduled therapy sessions. Although your child will not directly participate in this study, that is nothing about his/her treatment will change, s/he is still considered a subject in this study. The purpose of this letter is to provide you the information about this study and offer you an option to have your child excluded from this study.

The purpose of this study is to investigate the effectiveness of a training package to improve BT's teaching practices. Current supervision practices often require both the behavior technician and supervisor to meet at a mutually convenient time and place. Such procedure can be time consuming and physically challenging for technicians who are in a remote area. As technology becomes more accessible and web-based communication becomes a widely used option for daily communication, e-mail feedback is a viable platform and efficient method for delivery of performance feedback. In this study, we are targeting *instructive feedback* (IF). Instructional feedback involves expanding instructional comments provided to children after a correct response in Discrete Trial Training. If e-mail feedback is effective to improve BT's practice of IF, it will improve the quality of instruction and hence, the overall quality of services for your child.

This study will take place during your child's regular therapy sessions with Basics Northwest. The BT currently working with your child will videotape a portion of your child's session for up to 2 times per week. Each video is expected to be approximately 20 minutes and will be uploaded to a password-protected site accessible only to the researcher for review. Once the researcher has viewed the video, she will e-mail the BT feedback regarding his/her use and quality of IF. Your child's name will not be linked to the video, any data, or any feedback provided to the adult participant. We expect the length of this study to take at least 12 weeks but no more than 16 weeks total. By participation in this study, we anticipate the content, length, and frequency of your child's current therapy session will remain unchanged. It is possible that your child may feel discomfort with or be distracted by the present of the video equipment. It is, however, anticipated that the duration of the video will be fairly brief and occupy less than 20% of your child's regular therapy session. All video recordings will be kept for the entire duration of the study and destroyed on December 31, 2017. Although all information and data are stored securely, there is a potential for breach of confidentiality if data were inadvertently accessed or seen by someone other than the research team.

Participation in this study is entirely voluntary. I have enclosed a consent form describing the study in more detail. If you would like your child to participate, please fill out the attached consent form and mail it back to me in the enclosed stamped envelope within 2 weeks upon receipt of this packet of materials. Your child's behavior therapist will be following up by phone or e-mail in a week if I have not received a consent form. If you have any questions about this

study or do not wish to be re-contacted, please contact me at 425.802.6655 or by e-mail at ivycms@uw.edu. Thank you very much for your consideration of this study.

Ivy Chung, M.Ed., BCBA
College of Education, University of Washington

Appendix K: Consent Form for Guardians of Child Participants

UNIVERSITY OF WASHINGTON
CONSENT FORM FOR GUARDIANS OF CHILD SUBJECTS

Effects of Training and E-mail Feedback on Behavior Therapists' Use of Instructive Feedback

Researchers: Ivy Man Sum Chung, Graduate Student
Special Education, College of Education
Phone: 425-802-6655 / Email: ivycms@uw.edu
Faculty Advisor: Ilene Schwartz, College of Ed., 206-616-3450

Researchers' statement

We are asking your child to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether to give permission for your child to be in the study or not. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask your child to do, the possible risks and benefits, your child's rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions, you can decide if you want to allow your child to be in the study or not. This process is called "informed consent." We will give you a copy of this form for your records.

PURPOSE OF THE STUDY

We want to develop a convenient and effective way of delivering feedback to behavior therapists. In this study, behavior therapists will receive a one-on-one training session and e-mail feedback twice a week regarding their instruction. We want to find out if this training and e-mail feedback will improve the way that behavior therapists instruct their students.

STUDY PROCEDURES

This study will take place during your child's regular therapy sessions with Basics Northwest. The behavior therapist (BT) currently working with your child will videotape a portion of your child's session for up to 2 times per week. Each video is expected to be approximately 20 minutes. The BT will upload the video to a password-protected site hosted by the University of Washington. Once the researcher has viewed the video, she will e-mail the BT feedback regarding his/her use and quality of instructive feedback (IF). Your child's name will not be linked to the video, any data, or any feedback provided to the BT. We expect the length of this study to take at least 12 weeks but no more than 16 weeks total. Your child's participation in this study will not affect the content, length, and frequency of current therapy sessions provided by Basics Northwest.

RISKS, STRESS, OR DISCOMFORT

Presence of video equipment may create discomfort in your child. However, the length of the videotaping is fairly brief and will happen in less than 20% of the regular therapy session. We expect that your child will get used to the presence of the video equipment fairly quickly. If

during the study your child continues to show discomfort and anxiety, you can withdraw them at any time without penalty or effect to your services at Basic Northwest.

All video recordings are uploaded and stored in a highly secure database on a server administered by the University of Washington Technology and Catalyst programming staff. The programming staff are governed by the Federal, State, and UW computing standards.

Video recordings and all study-related data will be kept for the entire duration of the study and destroyed on December 31, 2017. All attempts will be made to ensure information and data are stored securely. However, there is a potential for breach of confidentiality when data are inadvertently accessed or seen by someone other than the research team. For electronic data that are deleted, these records are retrievable and could be obtained for legal reasons if required.

In the case of child abuse, child neglect, and imminent risk of serious harm observed or reported during the course of this study, the research team and/or Basics Northwest are required to report to Child Protective Services. You should be aware that once these reports are made, confidentiality of the data is no longer possible.

ALTERNATIVES TO TAKING PART IN THIS STUDY

Your child's participation in this study is strictly voluntary. You and your child can refuse to participate or withdraw from the study at any time during the course of the study. Should this happen, your child will continue to receive behavioral services from Basics Northwest, and the behavior therapist will no longer record and submit videos to the researcher. All previous video recordings will be destroyed on December 31, 2017.

BENEFITS OF THE STUDY

Your child may not directly benefit from participation in this study. Traditional types of feedback (e.g., face to face meetings) can be time consuming. This new method of using e-mail feedback has the potential to offer a more efficient way for supervisors to effectively monitor their staff's performance.

OTHER INFORMATION

You may withdraw your child from this study at any time without penalty or loss of benefits to which your child is otherwise entitled. Your child's legal name will not be linked to the video, any data, or any feedback provided to the behavior therapist; instead, a made-up name will be used.

Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review of this study takes place, your records may be examined. The reviewers will protect your privacy.

Parent's statement

This study has been explained to me. I volunteer my child to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or my child has been harmed by participating in this study, I can contact one of the researchers listed above. If I have

questions about my child's rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

Printed name of subject

Printed name of parent Signature of parent

Appendix L: Screening Phone Scripts

Screening Phase 1 – Phone scripts

Researcher: Hi XXX, my name is Ivy Chung. I have received the consent form and want to thank you for agreeing to participate in my dissertation study on using training and e-mail feedback to improve behavior therapist's use of instructive feedback. The purpose of my call today is to determine whether you would be eligible to take part in this study. This is the first Screening Phase, and I will ask you a few questions. If you pass this phase, I will give you more information about the second phase of screening. Before we start, do you have any questions I can answer you regarding this study?

Researcher (asks the following questions):

1. Do you hold at least a high school degree?
2. Have you received a minimum of 40 hours of training in Applied Behavior Analysis?
3. Do you currently work at least 4 days per week at Basics Northwest? If so, which 4 days do you work?

If the subject does not answer YES to any of the 3 questions above, he/she does not meet eligibility requirement. The researcher will then inform the subject about the decision.

Researcher: Thank you for answering all these questions. Unfortunately, our study requires the subject to have at least a high school degree OR have received 40 hours of ABA training OR currently work at least 4 days per week at Basics Northwest. Therefore, you will not be selected. Thank you for your interest in this study, and the time today to respond to my questions.

If the subject responses are YES to all 3 questions, the researcher will tell the subject he/she will then enter Screening Phase 2.

Screening Phase 2 – Phone scripts:
Researcher: Thank you for answering all these questions. You have met our eligibility requirement. The second phase of screening involves a competency check of your teaching behaviors. The first step is to have you hand out an opt-out form to the guardian(s) of the child whom you will videotape. I will inform Matt to give you a copy of this form. Once I have received this opt-out form, I will contact you and set up a Google e-mail account for you, this e-mail account should and will only be used solely for this study. I will also contact you and give

you specific instruction about making and submitting a video recording of your instruction with your client. Do you have any other questions? Thank you again for agreeing to participate in this study. Please don't hesitate to contact me if you have questions about this study at any time. I will be in touch with you again soon. Have a good rest of your day!

Appendix M: Orientation Handout

Email Feedback Study – Orientation Handout

Recording Videos:

- Landscape mode
- Capture both child and adult
- Capture materials
- Place the video equipment on a steady surface

Handling Videos:

- All videos must be recorded using the approved video-equipment provided by BASICS Northwest.
- Only videotape the child for whom you have obtained consent.
- Only upload the video to the approved and designated site i.e. Catalyst Connect It Dropbox. Do not attempt to share the videos with the researcher using other means.
- If the storage of your device gets full, please first check with the researcher if any previous recordings can be deleted.
- All videos should be treated as Protected Health Information (PHI) according to Health Information Portability and Accountability Act (HIPAA). In addition, subjects should follow BASICS NW's policy on handling client's private information and confidentiality. Some general rules to follow:
    - Do not share with the video to anyone who has no permission to access to the client's information
    - Videos taken are intended for use for this study only. If the clinical team of your client would like access to the same video, a separate consent following BASICS NW's policy must be obtained
    - Be aware of the environment of where the video is recorded. Only the target child should be captured in the video
    - Be aware of the environment of where the video is watched and uploaded. Do not watch the video in public where other people can easily see it.

Email Communication:

- All email communication will take place via your assigned Google email account.
- Please limit the use of this email account to communication related to this study only.
- You will NOT use the child's name in all email communication. You can, however, use the first initial if necessary. The researcher will do the same. For example, "I thought D had a much better session today with you, how wonderful!" versus "I thought Derek had a much better session today with you, how wonderful!"
- The researcher also will NOT use your name in all email communication to protect your confidentiality. It is also advised that you avoid using your name in the email such as at closing.
- When communicating via email, do NOT share any of your or the client's personal information with the researcher such as phone number, personal email, home address, DOB etc.

- Please check your email at least once a day.
- Please reply to the email within 24 hours.
- Do not share your email log in information with anyone.

Study Details

- Bookmark the Catalyst Dropbox URL for easy upload
- You are required to record 2 videos per week. But the second video must be recorded after the researcher has reviewed the first video.
- Please upload the videos within 24 hours.
- All videos should be uploaded to the assigned Dropbox folder from Catalyst Connect It
- The researcher will have another 24 hours to review the video and email you her feedback. In the email, the researcher will instruct you on when to submit the second video. Follow the instruction and do not submit 2 videos at once.
- The researcher will also email you upon receipt of the video. If you do not receive confirmation from the researcher within 24 hours, please email her.
- At any time you are unable to submit a video, please email the researcher the same day. The researcher will then give you instruction and/or reschedule a new video submission date.
- For any technical problems, please also contact the researcher directly

Researcher Contact Information:

Ivy Chung
425.802.6655
ivycms@uw.edu

Appendix N: Videotaping Instructions

ORIENTATION – VIDEOTAPING INSTRUCTIONS

Thank you for participating in this study and coming to this orientation. The purpose of this orientation is to provide you the information regarding instructions on videotaping your therapy sessions for this study. At the end of this orientation, you will learn how to:

- Record your therapy sessions using a Flip camera
- Drop off and pick up your video equipment
- Store the video equipment in a safe place
- Report to Maxim in the case of loss or damage of video equipment

Instructions on Recording:

1. You will be given *one* Flip camera and a tripod at the end of this orientation for you to record your therapy session.
2. To record:
    a. You will first turn on the camera by pressing the on/off switch on the side of the video camera.
    b. When the video camera is on, you will be able to see the real-life pictures on the screen.
    c. Set up the tripod at a place in the therapy setting that will allow you to keep the camera in a safe and stable place. Make sure the angle of the camera will cover the spot of teaching entirely before recording.
    d. When you are ready, press the middle "RED" button to start recording.
3. You will be informed by the Principal Investigator of this study on the 3 educational programs you will record.
4. You will begin recording as soon as your therapy session starts with the child. That is, when you have set up the teaching environment, and are ready to work with the child.
5. The recording should run until all teaching of the 3 educational goals is completed, that is, when all 30 trials of teaching for the 3 goals (i.e. 10 trials per goal) are completed.
6. If any breaks occur in between teaching trials, it is NOT necessary to pause the recording.
7. Upon completion of all teaching, you may stop recording and continue your teaching session as usual.

Dropping Off and Picking Up of Video Equipment:

1. You will be required to return the video equipment to Maxim office at Tacoma on the same day the video is taken. If the office is close when your videotaping session ends, please return the video equipment no later than the next business day.
2. When you arrive at the office, please notify one of the staff that you are here to drop off the video for the research study. A staff will take your *Flip* camera and place it in a locked drawer.
3. The staff will then contact the Principal Investigator and notify her of the drop-off.
4. The Principal Investigator will transfer the video to a computer, and password protect all videos. Once the video is transferred, it will be deleted from your video camera. You will also receive a phone call or an email from the PI to schedule a time for you to pick up the video camera from the office before your next scheduled videotaping session.

Storage of Video Equipment:

1. The content of the video is confidential and should be protected following Maxim's policy on "Privacy and Confidentiality of Information." Only the study staff will have access to the video content and you must not share the content of the video with anyone, including any non-study Maxim employees or staff.
2. The video camera should only be used for videotaping your therapy sessions with the assigned child clients. It should not be used with any other clients.
3. When your therapy session ends, the video camera should be dropped off at the office as soon as possible. In the case of traveling with the video camera in a vehicle, you should keep the camera in either a locked trunk or glove compartment of your vehicle. The video camera should NOT be in plain sight should you have to leave your vehicle temporarily.

Report of Loss or Damage of Video Camera:

1. The contents of the video should be treated as protected health information of the child client and be safeguarded.
2. If the video camera is lost or stolen, you must immediately contact the Principal Investigator by phone and file an incident report.
3. If the video camera is damaged, you must also immediately contact the Principal Investigator by phone and file an incident report.
4. All cautions must be taken to minimize the possibility of damage or theft.

Contact Information:

Ivy Chung, M.Ed., BCBA
Principal Investigator
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Appendix O: PowerPoint Presentation for Training

TRAINING - INSTRUCTIVE FEEDBACK (IF)

Ivy Chung
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Training Goals

1. What is instructive feedback?
2. Why use instructive feedback?
3. How to use instructive feedback?

What is Instructive Feedback?

- Instructive feedback (IF) is a teaching strategy that involves presentation of extra, non-target stimuli in the consequent event of instructional trials
- *Instructive* – new or additional information is provided
- *Feedback* – it is delivered after the learner responds correctly

What is Instructive Feedback?

- IF Procedure:
  1. Teacher presents instruction: What animal says moo?
  2. Child responds: Cow says moo
  3. Teacher delivers feedback: YEAH! Cow says moo
  4. Teacher delivers IF: Cow eats grass
- *Cow eats grass* is the extra and non-target stimulus *after* the child has responded correctly

What is Instructive Feedback?

- IF can also be delivered when the child's response is prompted and correct
- If the child responds incorrectly, the teacher will not present IF (instead should perform an error correction procedure)

What is Instructive Feedback?

- IF is a consequent event, and should not require a response from the child
  1. Teacher presents instruction: What animal says moo?
  2. Child responds: Cow says moo
  3. Teacher delivers feedback: YEAH! Cow says moo
  4. Incorrect presentation of IF: What does a cow eat?
- If a child responds, correctly or incorrectly, do not provide feedback (i.e. reinforcement or error correction)

Why use instructive feedback?

- Allow the learner to acquire additional behaviors without direct instruction or with less instruction when taught directly
- Increase efficiency of instruction

How to use IF?

- Three types of IF:
  1. Expansion
  2. Parallel
  3. Novel

Expansion IF

- Expansion IF stimuli are conceptually related to the primary target or from the same curriculum content area
- "expand the concept"
- Expansion IF Video Clip

Expansion IF

Instruction/ Primary Target	Child's Response	Consequence	Expansion IF	Non-examples
What is this (and show a picture of a hat)	Hat	Good job, this is a hat	You wear a hat on your head	What do you do with a hat?
Read this word	Cat	That's right, it says cat	It's spelled C-A-T	I have 2 cats at home
What is a bed for?	A bed is for sleeping	You got it, you sleep on a bed	Bed is furniture	What things are on your bed?

Expansion IF

- Let's come up with some examples together
- Example 1:
  1. Instruction: Show me the grocery store
  2. Response: child points to the grocery store picture
  3. Consequence: awesome you showed me the grocery store
  4. Expansion IF: ?????

Expansion IF

- Example 2:
  1. Instruction: What is this (show a picture of a horse)
  2. Response: child labels horse
  3. Consequence: You got it, that's a horse!
  4. Expansion IF: ?????
- Role play – Receptive Object ID

Parallel IF

- In parallel IF, both primary and parallel IF targets have different antecedent stimuli but the same learner response
- Parallel IF Video Clip

Parallel IF

Instruction/ Primary Target	Child's Response	Consequence	Parallel IF	Non-examples
What is this (and show a picture of a hat)	Hat	Good job, this is a hat	Show a different picture of a hat and say "this is hat too!	A hat can protect you from the sun on a sunny day
Show a dime and ask how much is a dime worth?	10 cents	That's right, a dime is worth 10 cents	Show the number 10¢	Show a quarter and say it's worth 25 cents
Show the word "Stop" and ask the child to read	Stop	Great, it reads STOP	Show a gesture of "stop"	Do you know what a red light means

Parallel IF

- Let's come up with some examples together
- Example 1:
  1. Instruction: Show a picture of a park and ask where is this place?
  2. Response: child labels park
  3. Consequence: Correct. It's a park.
  4. Parallel IF: ?????

Parallel IF

- Example 2:
  1. Instruction: Show me number 6
  2. Response: child points to 6
  3. Consequence: You got it, that one is 6
  4. Parallel IF: ?????
- Role play – Lowercase Letter Expressive ID

Novel IF

- Novel IF stimuli are neither conceptually related to the primary target nor from the same curriculum content area as the primary target
- Novel IF Video Clip

Novel IF

Instruction/ Primary Target	Child's Response	Consequence	Novel IF	Non-examples
What are these (and show a picture of hats)	Hats	Good job, this is a hat	Count "1, 2, 3 4, and 5 hats"	How many hats do you have?
Show me blue	Point to blue	Excellent, you showed me blue	This is a circle	Blue and yellow makes green
What does a cow say?	Moo	Yeah, a cow says moo!	Show a picture of a girl jumping and say "this girl is jumping"	A cow spells C-O-W

Novel IF

- Let's come up with some examples together
- Example 1:
  1. Instruction: Where do you park a car?
  2. Response: A garage
  3. Consequence: You got it, you park a car in a garage
  4. Novel IF: ?????

Novel IF

- Example 2:
  1. Instruction: Let's count the bears
  2. Response: 1, 2, 3, 4, 5
  3. Consequence: Right, 5 bears.
  4. Novel IF: ?????
- Role Play – Color Expressive ID

Summary

- Instructive feedback is the presentation of extra, non-target stimuli after a child's response to instruction. It is an effective and efficient teaching strategy to facilitate learning without direct instruction.
- The goal of this study is to increase your use of IF to at least 80% of your teaching through this training and the use of e-mail feedback

Next Step – E-mail Feedback Intervention

- Record and submit videos of your next instructional session
- You will begin receiving feedback from me specifically to your use of IF
- Questions?

THANK YOU!

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CURRICULUM VITAE

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EDUCATION

Ph.D., Special Education	May 2016	University of Washington, Seattle
M.Ed., Applied Behavior Analysis	June 2008	University of Washington, Seattle
B.S., Psychology	June 2006	University of Washington, Seattle

CERTIFICATION

- Board Certified Behavior Analyst
- Mental Health Professional (WA State)
- Agency Affiliated Counselor (WA State)

PROFESSIONAL EXPERIENCE

Executive Director	May 2013 – Present, Sum of Learning, LLC, Bellevue, WA
Program Manager	May 2013 – May 2014, Magnolia Behavior Therapy, Seattle, WA
Practicum Supervisor	September 2012 – June 2013, Special Education, College of Education, University of Washington, Seattle WA
Program Supervisor	January 2009 – May 2013, Maxim Healthcare Services, Tacoma, WA
Lead Tutor	July 2007 – August 2008, A.P.P.L.E. Consulting, Bellevue, WA

TEACHING EXPERIENCE

SPED 414 (Spring 2010) – Introduction to Early Childhood Special Education, College of Education, University of Washington

SPED 531 (Winter, 2014) – Planning Comprehensive Behavior Interventions, College of Education, University of Washington

PRESENTATIONS

Chung, I., Collado, J. (2014, May). Setting Up ABA Home-Program for Children with Autism. *Presented at the Infant and Early Childhood Conference.*

Chung, I. (2013, November). Applied Behavior Analysis and In-Home Therapy. *Presented at the 3rd Annual Lewis County Autism Conference*

Chung, I. (2012, March). Toilet Training for Children with Special Needs. *Guest speaking at a Special Education graduate class.*

Schwartz, I.S., & Chung, I. (2010, March). What Teachers Need to Know About Autism? *Presented at the Crib to Classroom Conference. Shoreline, WA.*

Chung, I., & Jones, C. (2009, October). Autism Spectrum Disorders and Applied Behavior Analysis. *Presented at the Arc of Washington – Tacoma Chapter. Tacoma, WA.*

PUBLICATIONS

I. Chung (April, 2014). Making a Safe Home for Your Child with Autism. *Everyday Health.* *http://www.everydayhealth.com/columns/health-answers/rearrange-the-home-environment-for-your-child-with-autism/*

I. Chung (October, 2009). What is Applied Behavior Analysis. *Autism Society of Washington, Tacoma Chapter.* *http://autismsocietyoftacoma.blogspot.com*

WORKSHOPS

Chung, I. (Present). Supporting Parents with Children with Autism Spectrum Disorder. *Open Doors for Multicultural Families, Kent, WA*

Jones, C., Ashmun, J., & Chung, I. (2016, March; 2015, October). Webinar: ABA Business 101 – Business Fundamentals. *Haring Center, University of Washington, Seattle, WA*

Jones, C., Ashmun, J., & Chung, I. (2016, April; 2015, November). Webinar: ABA Business 102 – Clinical Fundamentals. *Haring Center, University of Washington, Seattle, WA*

Chung, I. (2016, April). EIBI Series: Positive Behavior Support and Applied Behavior Analysis. *Open Doors for Multicultural Families, Kent, WA*

Chung, I. (2016, March). Positive Behavior Support Workshop. *Seattle Public Schools, Seattle, WA and Open Doors for Multicultural Families, Kent, WA*

Chung, I., Jones, C., Ashmun, J. (2015, July, January; 2014, March, September). 8-Hour BCBA Supervisor's Training. *Haring Center, University of Washington, Seattle, WA*

Chung, I. (2014, September). ABA Therapist 40-Hour Training Series. *Open Doors for Multicultural Families, Kent, WA*

Chung, I. (2013, November). Supporting Individuals with Autism. *Evangelical Chinese Church of Seattle, Redmond, WA*

Chung, I. (2013, July). Managing Challenging Behaviors Through Functional Behavior Assessment. *Little Kids Learning Academy, Hong Kong*

Chung, I., Bailey, A.G., & Collado, J. (2011, August). Parent Training: Introduction to Applied Behavior Analysis. *Maxim Healthcare Services, Tacoma, WA*

Chung, I. (2009-2013). Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Series I: Introduction to Autism Spectrum Disorders and Applied Behavior Analysis. *Maxim Healthcare Services, Tacoma, WA*

Chung, I. (2009-2013). Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Series II: Discrete Trial Teaching, Prompting, and Data Collection. *Maxim Healthcare Services, Tacoma, WA*

Chung, I. & Bailey, A.G. (2009-2013). Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Series III: Understanding Challenging Behaviors using Functional Behavioral Assessments & Measuring Behaviors. *Maxim Healthcare Services, Tacoma, WA*

Chung, I. & Bailey, A.G. (2009-2013). Intensive Behavioral Intervention for Children with Autism Spectrum Disorders. Series IV: The Use of Visual Support for Children with Autism. *Maxim Healthcare Services, Tacoma, WA*

PROFESSIONAL MEMBERSHIP AFFILIATIONS

- Association for Behavior Analysis
- Association for Professional Behavior Analysts
- Washington Association for Behavior Analysis